North Coast - North Channel MPAs Management Plan

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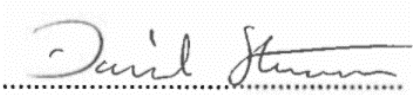

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Further Information

Agri-Food and Biosciences institute

Fisheries and Aquatics Ecosystems Branch

Marine Ecology

18A Newforge Lane

Belfast

BT9 5PX

Tel: 028-90255472

MarPAMM: Marine Protected Areas Management and Monitoring

SEUPB Case Officer: Andrew King

Project coordinator: Agri-Food and Biosciences Institute (AFBI)

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Author Stevenson, D., O'Sullivan, R., Beck, S., Boyd, A., McMinn, C., Maguire, PJ., Moore H., Callaway, A., Poppleton, V. and Wilson, N.

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Glossary of Terms

AFBI Agri-Food and Biosciences Institute

AMR Antimicrobial resistance

AONB Area of Outstanding Natural Beauty

ASSI Area of Special Scientific Interest

BTO British Trust for Ornithology

BSAC British Sub-Aqua Club

CEDaR Centre for Environmental Data and Recording

DAFM Department of Agriculture Food and the Marine

DAERA Department of Agriculture, Environment and Rural Affairs

DECC Department of the Environment, Climate and Communications

DECCL Department of Energy and Climate Change London

DfE Department for the Economy

DfI Department for Infrastructure

DoD Department of Defence (RoI)

DHLGH Department of Housing, Local Government and Heritage

EC European Commission

ECC Environment European Commission

EEZ Exclusive Economic Zone

EPG European Programmes and Gateways Unit

EU European Union

EWL Extreme water levels

FCL Fish Culture Licence

GLS Global Location Sensor

GPS Global Positioning System

GSM Global System for Mobile

HPAI Highly Pathogenic Avian Influenza

HRA Habitats Regulations Assessment

ICES International Council for the Exploration of the Seas

ICPS Irish Coastal Protection Strategy

IMO International Maritime Organisation

INNS Invasive Non-Native Species

IPCC Intergovernmental Panel on Climate Change

IRBD International River Basins District Management Plan

IUCN International Union for the Conservation of Nature

IWGD Irish Whale and Dolphin Group

iVMS Inshore Vessel Monitoring System

JNAPC Joint Nautical Archaeology Policy Committee

JNCC Joint Nature Conservation Committee

JSP Joint Service Publication

LA Local Authority

LPG Liquid Petroleum Gas

MarPAMM Marine Protected Area Management and Monitoring

MCA Maritime and Coastguard Agency

MCRT Marine and Fisheries Division Marine Conservation and Reporting Team

MCZ Marine Conservation Zone

MEPC Marine Environment Protection Committee

MLS Minimum landing size

MMO Marine Mammal Observer

MoD Ministry of Defence

MPA Marine Protected Area

NBDC National Biodiversity Data Centre

NGO Non-Governmental Organisation

NHA Natural Heritage Area

NI Northern Ireland

NIW Northern Ireland Water

NMPF National Marine Planning Framework

NPWS National Parks and Wildlife Service

NWSMP National Wastewater Sludge Management Plan

OPW Office of Public Works

OSPAR Oslo and Paris Conventions

PADI Professional Association of Diving Instructors

PAM Passive Acoustic Monitoring

PWMP Port Waste Management Plan

PWC Personal Watercraft

REM Remote Electronic Monitoring

RLG Regional Locational Guidance

RoI Republic of Ireland

SAC Special Area of Conservation

SPA Special Protection Area

SLR Sea-Level Rise

SSA Sub-Aqua Association

SWOT Strengths, Weaknesses, Opportunities and Threats

TDR Temperature Depth Recorder

TENs Trans-European Networks

UK United Kingdom

UNESCO The United Nations Educational, Scientific and Cultural Organisation

Executive Summary

The Marine Protected Areas Management and Monitoring (MarPAMM) project developed tools for monitoring and managing Marine Protected Areas (MPA) within Northern Ireland (NI), the Republic of Ireland (RoI) and Western Scotland (WS).

Through the development of six management plans, MarPAMM aimed to increase capacity in and collaboration between NI, RoI and WSfor MPA management planning, to enable wider, integrated marine planning and management. The following objectives were created to achieve this aim:

- Collate existing best practice on the production of MPAs management plans including those on governance, stakeholder engagement, management planning and communications; and
- MarPAMM Management Plans within the island of Ireland aim to:
    - Deliver feature conservation condition benefits.
    - Deliver benefits from management guidance for marine activity users from co-management and scientific outputs for stakeholders and local communities.
    - Promote greater integration between MPAs management and wider marine management frameworks; and
    - Focus on the connections between MPAs in the three different jurisdictions.

This management guidance plan delivers outputs from INTERREG VA Objective 2.2, through the production of a regional MPAs management document for the MPAs within the North Coast - North Channel region. The management plan aims to support the delivery of strategic conservation, building on existing best practice approaches to MPA management (e.g., risk-based, adaptive management) and aid adaptation. This can effectively create resilience and adaptability to protect, maintain and enhance the environs of the North-Coast-North Channel MPAs region.

Examinations of the rationale behind the guidance has identified key areas for management considerations, such as renewable energy development, recreation and tourism practices and climate change. Review of the scientific outputs and stakeholder engagement from the MarPAMM project have helped to identify and devise key recommendations for current and future management of designated features and adjacent areas within this management plan area.

Key recommendations include:

1. **Growth in renewable energy development:** Results from the MARPAMM research have indicated that sea bird species including, Black-legged Kittiwake (*Rissa tridactyla*) and Black Guillemot (*Cepphus grylle*) could be at risk from offshore renewable energy developments. A key requirement is for long term monitoring of these impacts (Johnston *et al.,* 2022).
    a. Long-term monitoring will also need to focus on the impact on seabed and benthic species.
2. **Growth of recreation and tourism**: A key recommendation is that activity users need guidelines to help support environmentally friendly practices.
    a. Areas of concern that have been identified are the impacts from fast watercrafts, jet skis and recreational dog walking etc. The plan recommends users follow codes of conducts such as the WiSe Scheme, Leave No Trace and Share the Shore.
    b. Identification from managing authorities on potential areas of future zoning and PWCs prohibited areas within MPAs could be beneficial for the management of fast personal watercraft.
    c. Government Departments and Local Authorities across the island of Ireland need to explore campaigns for education and awareness sharing for recreational interactions with MPAs.
3. **Growth of anthropogenic climate change**: Increasing coastal risk (i.e., flooding and erosion) will have significant effects on coastal developments, infrastructure, and designated features.
    a. A key recommendation is that management migrates from an Engineered (Hold the Line) response to climatic vulnerability, to regimes focussed on Managed Realignment with 'Nature Based Solutions' (NBS).

Implementation of the North Coast – North Channel MPAs management plan is expected to produce outputs which are hierarchical in their nature. This means enabling issues to be addressed at the appropriate level, from strategic regional issues, to those best dealt with at a local scale. Outputs will be delivered through working closely with stakeholders, work package partners and sister projects, such as SeaMonitor to build upon evidence bases and support robust management approaches.

1. Regional setting: location, boundary & context.

1.1. Overview and context of the North Coast - North Channel MPAs area.

The North Coast - North Channel region is in the north of the Island of Ireland and encompasses all the transboundary inshore marine areas from Mullaghmore, County Sligo, to Belfast Lough, County Antrim. The boundary created for the North Coast - North Channel region includes all marine areas and extends only into terrestrial areas which include designated features that experience seawater inundation/direct influence i.e., saltmarsh and foredune complexes. Categorically terrestrial features such as hinter dunes are not included in the plan area.

The area hosts a diverse range of unique, important and/or threatened species and habitats, which are reliant on the biological and physical features contained within these marine habitats. MPAs and adjacent areas play an important role for biodiversity through supporting services within ecosystem service delivery, i.e., nutrient recycling. Additionally, these areas have economic and social importance through industry, trade, recreation, spirituality, source of energy and cultural heritage.

The ethos behind the development of the MarPAMM North Coast - North Channel MPAs management guidance was to provide additional support for delivery of conservation benefits from MPAs whilst working in parallel with local communities and stakeholders. Input from a Steering Group comprising of a pool of stakeholders from industry, government, non-governmental organisations, and the local community, developed a stakeholder-led plan of guidance for this cross-border area. The information presented herein is a combination of aspirational targets and existing legislation that are presented as guidance for interested parties. This guidance is not wholly statutory documentation and as such cannot be fully enforced as a management plan; for ease of reference and discussion it is referred to herein as the ‘management plan’.

The North Coast - North Channel MPAs Management Plan seeks to protect all inshore marine areas and designated features to aid sustainability. This will help to secure the long-term functioning ability for ecosystem services for provisioning and regulating, areas of economic and social, and areas of cultural importance. This document presents policy for coastal and marine designated features from a strategic level, between all MPAs, and adjacent areas from the mean high water spring tide mark.

This management plan was developed collaboratively between the Northern Ireland (NI) and Republic of Ireland (RoI) in a mirrored cross-border approach with the focus on MPA designated species and habitats selection and working with key marine stakeholders in each jurisdiction. The management policy was developed through existing best practice for marine management and supports conservation benefits which help to enhance the sustainability and aid the strategic management of an ecologically coherent, well-managed network of MPAs across the north of the island of Ireland.

Increasingly, there are new pressures in the marine environment with the impacts from anthropogenic climatic change and changes in maritime activities, such as the growing interest in maritime renewable energy generation. These pressures and/or activities require a strategic management approach to enable environmental, economic, and social resilience. Further pressures have been identified through the stakeholder engagement groups, from increasing pressures of tourism and recreation during the Covid-19 pandemic. These pressures impact designated habitats and designated features. The management plan will inform and assist marine managers within Northern Ireland and the Republic of Ireland by supporting statutory marine management through the Marine Act (Northern Ireland) 2013 and the Maritime Area Planning Act (2021). The management plan aims to support marine activities while enhancing the conservation and resilience of designated features and adjacent areas.

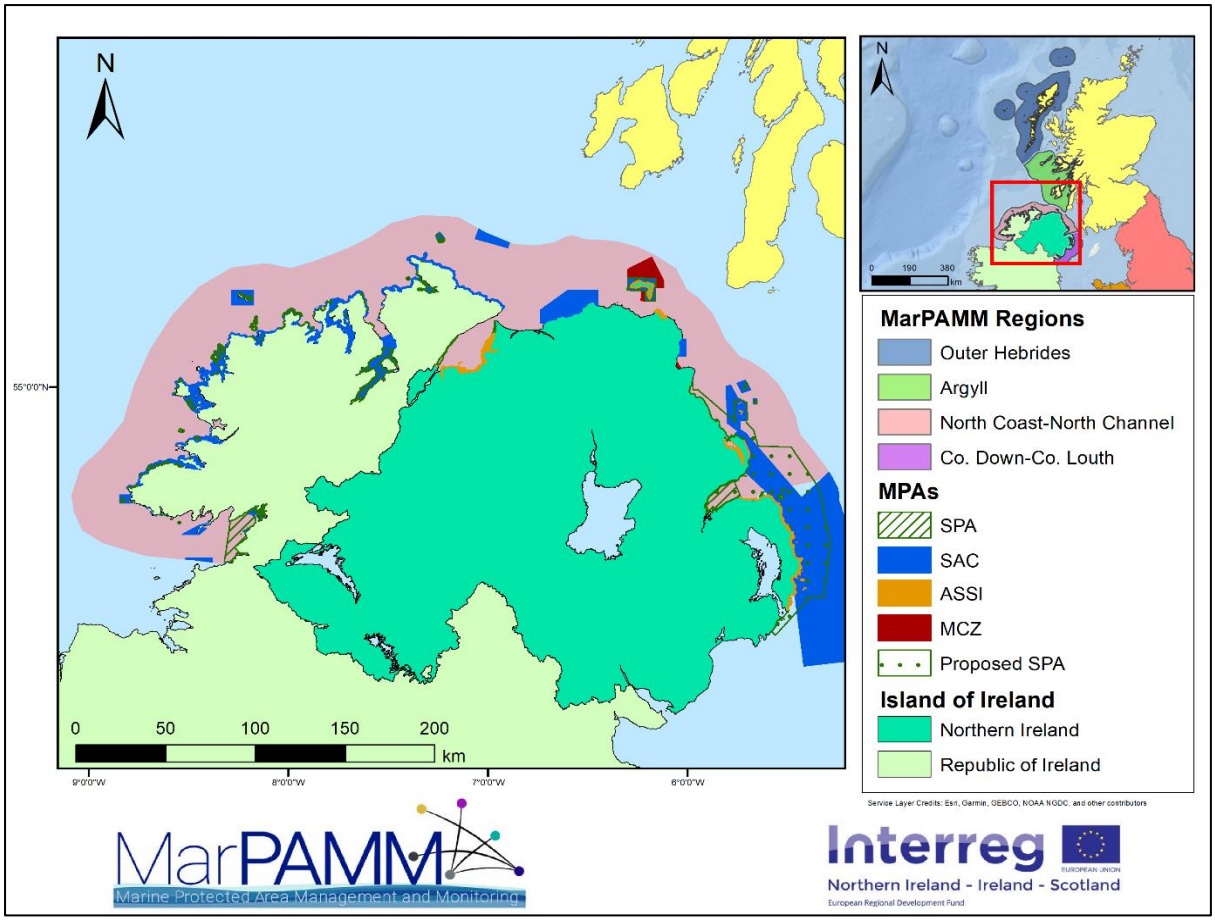

Figure 1: North Coast - North Channel MPAs Management Plan area and designated marine protected areas it encompasses (Source: AFBI, 2022).

1.2. Overview of what the plan seeks to achieve.

The management plan supports sustainable use of the marine environment within the Special Protected Areas (SPAs), Special Areas of Conservations (SACs), Marine Conservation Zones (MCZs) and Areas of Special Scientific Interest (ASSIs). The focus of management is on designated features, and collaboration between stakeholders and wider governance of marine planning and management. This is achieved through the objectives below:

a. Support the delivery of strategic conservation benefits and identify aspirations of activity users/ local communities for site specific guidance which may fall outside of legislation, particularly in relation to how they may benefit from the MPAs.
b. Planning at a scale which enables site-specific and strategic actions (i.e., climate change adaptation) to be applied to create enhanced integration within wider marine management.
c. Ensure a focus on the connections between MPAs, assisting stakeholders' understanding that these protected areas are part of an interconnected network and that actions outside of MPAs can still influence the features within them; and

d. Share lessons learned from this innovative approach of management planning at a regional scale amongst project partners.

Successful and effective management needs to be underpinned by the best available evidence, supported widely, and include regular reviews and updates based on monitoring outcomes and new knowledge. To support this, the management plan was developed to raise awareness of the diverse range of species and habitats located within the different MPAs and adjacent areas. This focusses on how to achieve conservation benefits which enhance sustainability and supporting a well-managed, ecologically coherent, marine and coastal environment.

The management plan will assist decision makers in developing a consistent approach and understanding of the subject of regional MPA management, improving communication of decisions from relevant authorities. The management plan will be used as a marine management tool and could be considered as a material consideration in the determination of activities of marine orientated development. The guidance approaches used to inform the management plan were developed by adapting existing best practice from across the European Union (EU), the United Kingdom (UK) and the Republic of Ireland (ROI). Innovative guidance approaches were also developed using MarPAMM project partner outputs from the four science-focused work packages.

The management plan outputs will inform and aid decisions for marine managers operating within the management plan area by supporting wider marine management associated with marine spatial planning. Relevant marine planning policy and legislation is in Table 1.

Table 1: Marine Spatial Planning within the island of Ireland.

Northern Ireland	Republic of Ireland
Marine and Coastal Access Act 2009	Marine Strategy Framework Directive
The Marine Strategy Regulations 2010	
Marine Policy Statement 2011	EU Maritime Spatial Planning Directive (2014)
Marine Act (Northern Ireland) 2013	Maritime Area Planning Act 2021
Draft Marine Plan 2018	

This management plan is non-statutory but is being produced in collaboration with the Regional Steering Group and the statutory authorities, the Department of Agriculture, Environment and Rural Affairs (DAERA) and the Department of Housing, Local Government and Heritage (DHLGH). The stated guidance and monitoring from this MPAs Management Plan should continue to have effect (where relevant) unless and until such guidance is updated, revised, or replaced by new Departmental (NI &/or RoI) guidance or a statutory policy.

OSPAR and next steps.

The OSPAR convention considers MPAs as sites for which conservation measures have been created, making use of protective, restorative, and precautionary governance to protect and conserve species, habitats, ecosystems, or ecological processes in the marine environment (OSPAR, 1998). The OSPAR commission provides a mechanism through collaborative governance with EU and non-EU members to protect the marine environment of the North-East Atlantic, encompassing a wide array of marine issues from work on pollution and dumping at sea to the conservation of marine biodiversity (OSPAR, 2006).

The RoI has committed to establishing a series of MPAs as to protect local marine biodiversity. Ireland has established several SACs and SPAs as OSPAR MPAs for marine habitats of qualifying interest. These are specific areas where it is now mandatory to cultivate and sustain a 'favourable conservation status' where there is the presence of registered species of 'qualifying interest' and are considered protected under the EU Habitats and Birds Directive (Classen, 2020). Currently there are 248 identified SACs and SPAs in Irish waters, comprising 2.4% of Irelands Exclusive Economic Zone (EEZ) (Classen, 2020).

In parallel, NI's commitment to the objectives of the OSPAR commission is through marine conservation work undertaken by DAERA within SACs, SPAs, and Marine Conservation Zones (MCZs) (DAERA, 2021a). NI has committed to developing and maintaining a network of well-managed MPAs through the application of management plans to help steer activity use approaches within the area. The actions developed through this management plan will operate alongside other management plans developed by the MarPAMM project which can act as an essential tool in delivery of the OSPAR objectives. All marine SACs and SPAs in NI are OSPAR MPAs. All MCZs within NI are also OSPAR MPAs except the Strangford Lough MCZ.

1.3. Co-management, social-ecological system, and stakeholder engagement.

Conventional approaches to marine protection and management (SPAs and SACs) across the Island of Ireland are often based on top-down resource management. However, this approach is considered "*often blind to users social, economic and cultural conditions*" (Berkes, 2009). Increasingly, co-management is implemented into governance regimes due to failures of historical approaches; this provides a mechanism for engagement and collaboration with fishers and other stakeholders in governance (Wilson *et al*., 2003 & Kooiman *et al*., 2005). Co-management refers to shared authority and decision making between parties, often a combination of local communities and stakeholders, non-governmental organisations (NGOs) and the Government (Berkes, 2010). This governance approach enables the sharing of power and responsibility for local resource uses, maintenance and sustainability between Government Departments and local stakeholders instead of a regionalised government approach.

Part of the work within MarPAMM was to develop strategic policies for a MPA management plan focusing on the ecological and transboundary significance of the area situated within the island of Ireland. A co-management governance approach was taken as it enables the sharing of authority and decision making between all involved parties and maintains sustainability between Government Departments and local stakeholders instead of a regionalised government approach (Berkes, 2010). This management plan was developed in conjunction with existing best practice methods for marine management and delivers conservation benefits by providing a tool to apply efficient and sustainable marine management practices, which in turn will lead to the enhancement of a structured, ecologically coherent, well-managed network of MPAs.

The Social-Ecological Systems Framework (Ostrom, 2009) has been used as a tool to aid examination of challenges in human-environment interactions (Nagendra and Ostrom, 2014). In this context, MPAs can be viewed as complex social-ecological systems where human activities and nature overlap and interact. The complexity of different designations, spatial dynamics, and activity overlaps between economic and social sectors, require a governance framework that embeds co-operation and collaboration. Mounting evidence suggests that organisational, economic, and social factors determine the overall success or failure of a MPA (Bennett *et al.*, 2020; Chaigneau and Brown, 2016). To enable effective responses to resource management within MPAs there needs to be greater inclusion through stakeholder engagement (Freeman *et al*., 2018). Co-management was applied to the MarPAMM project to enhance critical stakeholder engagement. To achieve this, MPA management project officers created a stakeholder engagement strategy for the plan area (Appendix 1).

The stakeholder engagement strategy focussed on a pool of stakeholders with regional and local knowledge of marine and coastal functions. It was essential that stakeholders held roles with direct association to these environments to better shape and evolve management guidance and aspirations for the project, agree potential benefits with plan partners and identify potential gaps within data collection. The role of the Steering Group was to advise on spatial use of areas by sectors, illustrate perceived and observed interactions and provide detail on any formal/informal management practises implemented by sectors. The Steering Group also examined the development of guidance approaches by interpreting modelling and scientific discussions from project work packages and providing critical comment on plan drafts. This helped create innovative solutions to relevant issues in areas within and adjacent to MPAs and provided an opportunity for stakeholders to draw on their experience and knowledge. In September 2020, stakeholder mapping (Figure 2) was undertaken to ensure wide representation of marine stakeholders.

From September 2020, the members of the Steering Group worked with MPA management policy officers to explore and examine the critical issues and pressures that should be addressed to support effective and robust management of the plan area. These discussions led to the identification of key themes that were developed into stakeholder objectives. These objectives represent the key components that Steering Group members wanted the regional management plans to achieve and include:

a) The creation of policy that is evidenced on robust species data that creates a dynamic tool to aid biodiversity restoration and promotes resilience,
b) The application of a proactive ecosystems approach to enhance healthy biodiversity and seas,
c) Developing effective stakeholder consultation and engagement to balance activity challenges with competing priorities within MPAs,
d) Developing awareness and information sharing with marine/coastal users on the impact from activities within and adjacent to MPAs, and
e) The creation of a strategic management plan which fosters empowerment of stakeholders at the core of the process whilst bestowing local ownership.

These objectives were further developed into a stakeholder benefits mapping exercise which was analysed through a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. The analysis examined issues/pressures identified through Steering Group meetings in terms of frequency and consensus for relevant management considerations. The SWOT analysis outputs were modelled into a ‘Benefits Realised’ infographic (Appendix 2), which was reviewed and refined by stakeholders. The

threats and weaknesses were subsequently modelled into 13 key management guidance criteria areas:

- Commercial Fishing,
- Aquaculture,
- Benthic Dredging and Disposal,
- Offshore Renewable Energy,
- Offshore Oil and Gas,
- Recreation and Tourism,
- Ballast Water and Accidental Runoff,
- Land Use Sediment Run-off,
- Wild Seaweed Foraging and Cultivation,
- Research and Education,
- Military and Defence,
- Marine Infrastructure and Shipping and
- Climate Change.

These criteria form the policy areas that will provide additional support for delivery of conservation benefits from MPAs and surrounding areas. The intention of this plan is to provide management guidance that is applicable to MPAs and their designated features, as well as adjacent areas outside of designations to help achieve the sustainable use of the marine environment and resources. This is a principal output from the MarPAMM management planning process.

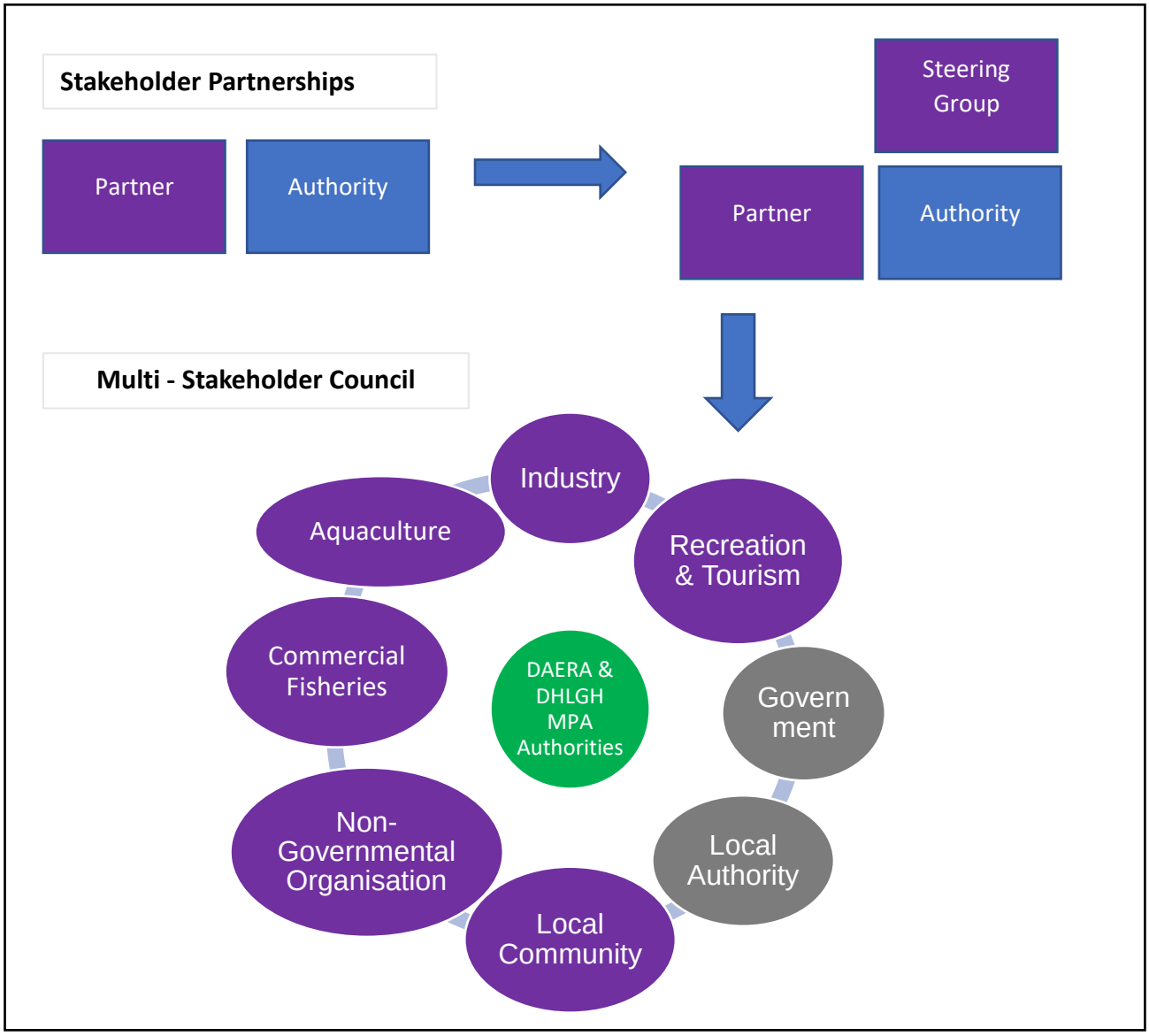

Figure 2: Evolution of the North Coast – North Channel MPAs management plan Steering Group (Adapted from Brumbagh, 2017).

2. Description of Features.

MPAs is an umbrella term dedicated to a collective group of designated coastal and offshore marine locations that are protected by either international, national, or voluntary agreements (Classen, 2022). They have been defined by the International Union for the Conservation of Nature (IUCN) as –

"*Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment*" (Kelleher, 1999 & IUCN, 2021).

On the island of Ireland there are several different MPA designation mechanisms in place for the protection of important local and cross-border species, under both NI and RoI jurisdictions; SACs, SPAs, ASSIs, MCZs and Ramsar Sites. The definitions of these MPAs are shown below in Table 2.

The management plan encompasses all inshore marine areas from Mullaghmore, County Sligo to Outer Belfast Lough, County Antrim. This document presents guidance on the appropriate management of coastal and marine features, and adjacent areas from the mean high water spring tide mark, covering an area of approximately 21,490 km^2.

It is important to note that a strict, legal status for the designation of MPAs does not yet exist in the RoI (Classen, 2020). Instead, SACs and SPAs are used and have been designated to any sites of concern within the RoI. For this management plan, these SPAs and SACs will be considered as RoI MPAs.

The aim of the North Coast – North Channel MPAs management plan is to provide guidance on the protection of feature designations from a holistic cross boundary perspective, acknowledging that marine species do not adhere to political spatial boundaries. This management plan will attempt to create guidance that will complement each jurisdiction's methods of conservation, that enhances sustainability for vulnerable habitats and species.

As this is a regional MPAs management plan, the focus is not on the individual species, habitats, or single designation but about the strategic and interconnected

management of similar features between different MPAs and adjacent areas, including international boundaries between, NI, RoI and western Scotland. To achieve this, similar species or habitats in different designations are excluded as the management considerations will be the same across the entire North Coast - North Channel MPAs management plan area.

Table 2. Description of current MPA designations within the island of Ireland.

Current MPA designations in the island of Ireland	
Island of Ireland Special Areas of Conservation (SACs)	Marine areas that have been designated for the protection of habitats and species of "*qualifying interest*" listed under Annex I and II of the European Habitats Directive due to identified threats to habitat conditions and species safety (JNCC, 2020).
Island of Ireland Special Protected Areas (SPAs)	Areas on land or at sea that have been designated for the protected of avian species of '*qualifying interest'* as determined under Annex I of the Birds Directive (2009/147/EC) (JNCC, 2020).
Northern Ireland Areas of Special Scientific Interest (ASSIs)	Coastal/marine transitioning areas within this management plan designated for the protection of important species, habitats, or geological features that have been considered to contribute to the conservation of important locations (DAERA, 2019a).
Northern Ireland Marine Conservation Zones (MCZs)	Protected areas designated for the protection of important marine species in English, Welsh, and Northern Irish territorial and offshore waters (JNCC, 2019a)

Island of Ireland Ramsar Sites	Wetlands of international importance designated for protection under qualifying criteria from the Ramsar Convention of Wetlands due to the presence of rare or unique wetland types and their contribution to the conservation of biological diversity (JNCC, 2019b).

Examples of SPAs, SACs and MCZs within the North Coast – North Channel Management Plan Region.

Lough Swilly SPA.

Lough Swilly SPA (Figure 3) is a large coastal sea inlet, located in the northern region of Co Donegal in the RoI, situated along the west side of the Inishowen Peninsula and cuts through a variety of metamorphic rock features (NPWS, 2011). Site features include the estuaries from the River Swilly, the River Leannan and the Isle Burn, with predominant habitats of sand and mudflats, protected under Annex I of the E.U Habitats Directive (92/43/EEC) (NPWS, 2011). Several man-made features including a lagoon and three large areas of polder land (Blanket Nook, Big Isle and Inch Levels) provide a large variety of wetland habitats that support over 20,000 species of wintering water birds, including Greenland White fronted Goose *(Anser albifrons flavirostris)* and Great Crested Grebe *(Podiceps cristatus)*. The full list of species and habitats within the North Coast – North Channel region can be found can be found in Appendix 3.

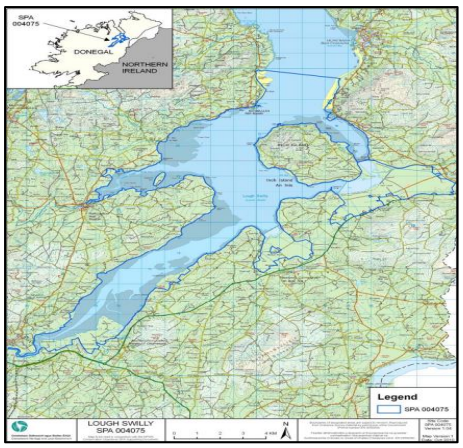

Figure 3: Site map of Lough Swilly SPA.

The Maidens SAC.

The Maidens SAC is a mostly subtidal, remote location of rocky reefs that have become detached from the North East coast of Larne, in NI. Site features include bedrock reef with smaller portions of stony reef, protected under UK Habitats Regulations 2017 (DAERA, 2017a).

Figure 4: Grey Seal (*Halichoerus grypus*) (© Van der Lon, 2015).

In areas to the south of East Maiden Island there are shallow stable sandbanks which includes other long-lived species. The remote rocks and island features of the Maidens SAC provide important, sheltered haul-out and resting sites for protected Grey seals (*Halichoerus grypus*), with 2009 surveys confirming that the location is also being used as an important site for both pupping and breeding (DAERA, 2017a).

Skerries and Causeway SAC.

Skerries and Causeway SAC is located along the north coast of NI in the eastern part of a 30km wide embayment, with Inishowen Peninsular to the west and Benbane Head to the east (DAERA, 2017b). The site is exposed to the warming gulf stream and strong tidal currents flowing from the North Channel to and from the Irish Sea (DAERA, 2017b). Site features include Annex I reefs, sandbanks, submerged sea caves and harbour porpoise (*Phocoena phocoena).*

Figure 5: Harbour porpoise (*Phocoena phocoena*) (© Campbell, 2008).

The SAC also contains other marine mammal species such as grey seal (*H.grypus*) common seal (*Phoca vitulina*) and bottlenose dolphin (*Tursiops truncatus*). Harbour porpoise (*P. phocoena*) have been consistently recorded within the Skerries and Causeway SAC with more than 140 dedicated effort watches at six sites within the SAC's boundaries. These watches have been carried out in every month of the year and confirm the consistent presence of harbour porpoise (*P. phocoena*) year-round, proving it is a location of high ecological value for this species (DAERA, 2017b).

Waterfoot MCZ.

Waterfoot MCZ is a small embayment located off Waterfoot village along the east coast of County Antrim in NI. The MCZ has been designated due to the presence of Seagrass beds (*Zostera marina*) on sublittoral sands, a priority Marine Feature and a OSPAR threatened or declining species (DAERA, 2016a). These sublittoral sea grass beds are known for their important contribution to the conservation of local biodiversity and are considered "*ecosystem engineers*" by providing natural shelter and habitats for marine organisms and various fish species (DAERA, 2016b). Seagrass beds are also well-known carbon sequesters which could be used to counter the negative effects of climate change.

Figure 6: Seagrass (*Zostera marina*) in Waterfoot MCZ.

2.1. Seabirds.

To help achieve the conservation objectives and favourable status for designated SPAs within this Management plan, species are examined from a strategic transboundary perspective. This is justified as many individual species occur within multiple SPAs and experience similar common threats and pressures either in breeding locations or in foraging areas of the sea (Howells *et al.,* 2022). The work undertaken through the seabirds works package has highlighted that colonies within each region may be also subject to meta-population processes, forming a network of interconnected sites. These can be managed through combined actions, although this can be challenging (Howells *et al.,* 2022). Thus, management interventions implemented at a regional, rather than site level may benefit multiple species across a suite of SPAs within a given area (Oppel *et al.*, 2018). As such, conservation outcomes and management plans may be more successful and cost-effective for seabird populations through regional actions across these SPA networks.

Figure 7: Atlantic Puffin *(Fratercula arctica*) (© O'Sullivan, 2022).

The seas between NI, the RoI and the west coast of Scotland collectively support various internationally important populations of 25 species of breeding seabirds (Johnston *et al.,* 2021). As part of MarPAMM, Bird Watch Ireland (BWI) has carried out a wide variety of research from 2018 to 2022. This work included seabird surveys of a variety of species including cliff nesters such as Fulmar (*Fulmarus glacialis*), Kittiwake (*Rissa tridactyla*), Common Guillemot (*Uria aalge*) and Razorbill (*Alca torda*); burrow- and crevice-nesters, Atlantic Puffin (*F. arctica*) and European Storm-petrel (*Hydrobates pelagicus*). BWI conducted tracking work (to identify foraging areas and non-breeding season ranges), aerial and boat-based at-sea survey work in Donegal Bay.

The various coastal cliff locations within the North Coast - North Channel region provide multiple environments, perfect for cliff and burrow nesting seabirds. For example, the sea cliffs and sea stacks in the Rathlin Island ASSI provide nesting sites for NI's largest population of Puffins (*F. arctica*) (DAERA, 2015a).

Wetland locations such as the Lough Foyle SPA is an extremely important ornithological site that supports internationally important populations of multiple avian species, of which include the Light – Bellied Brent Goose (*Branta bernicla hrota*) (NPWS, 2015a).

Table 3: North Coast – North Channel Seabirds Republic of Ireland.

Area	Feature Type	Feature
Inishmurray SPA	Species	Shag (*Phalacrocorax aristotelis*), breeding
	Species	Barnacle Goose (*Branta leucopsis*), wintering
	Species	Herring Gull (*Larus argentatus*), breeding
	Species	Arctic Tern (*Sterna paradisaea*), breeding
	Species	Storm Petrel (*H. pelagicus*), breeding
	Species	Great Black-backed Gull (Larus marinus), breeding
	Species	Lesser Black-backed Gull (*Larus fuscus*), breeding
	Species	Common Gull (*Larus canus*), breeding
	Species	Fulmar (*F. glacialis*), breeding
Aughris Head SPA	Species	Kittiwake (*R. tridactyla*), breeding
	Species	Razorbill (*Alca torda*), breeding
	Species	Guillemot (*U. aalge*), breeding
Ardboline Island and Horse Island SPA	Species	Cormorant (*Phalacrocorax carbo*), breeding
	Species	Eider (*Somateria mollissima*), breeding
Durnesh Lough SPA	Species	Whooper Swan (*Cygnus cygnus*)
	Species	Greenland White-fronted Goose (*Anser albifrons flavirostris*)

Donegal Bay SPA	Species	Great Northern Diver (*Gavia immer*), wintering
	Species	Common Scoter (*Melanitta nigra*), wintering
	Species	Light-bellied Brent Goose (*Branta bernicla hrota*), wintering
	Species	Sanderling (*Calidris alba*), wintering
	Species	Black-throated Diver (*Gavia arctica*), wintering
	Species	Red-throated Diver (*Gavia stellata*), wintering
	Species	Red-breasted Merganser (*Mergus serrator)*, wintering
Inishduff SPA	Species	Storm Petrel (*H. pelagicus*), breeding
Rathlin O'Birne Island SPA	Species	Common Tern (*Sterna hirundo*)
	Species	Black Guillemot (*Cepphus grylle*), breeding
West Donegal Coast SPA	Species	Guillemot (*U. aalge*), breeding
	Species	Atlantic Pufin (*F. arctica*), breeding
	Species	Chough (*Pyrrhocorax pyrrhocorax*), breeding
Sheskinmore Lough SPA	Species	Whooper Swan (*Cygnus cygnus*), wintering
Illancrone and Inishkeeragh SPA	Species	Little Tern (*Sterna albifrons*)
Tory Island SPA	Species	Black-headed Gull (*Chroicocephalus ridibundus*), wintering
West Donegal Islands SPA	Species	Shag (*Phalacrocorax aristotelis*), breeding
Lough Swilly SPA	Species	Great Crested Grebe (*P. cristatus*)
	Species	Greylag Goose (*A. anser*)
	Species	Slavonian Grebe (*Podiceps auritus*), wintering

(*NB* was unavailable but SPA site/species trends will be published in 2023 in the JNCC-led 'Seabirds Count – A survey of breeding seabirds in Britain and Ireland (2015–2021)' book).

Table 4: North Coast – North Channel Seabirds Northern Ireland.

Area	Feature Type	Feature	Condition Status
Lough Foyle SPA	Species	Light-bellied brent goose (*B. hrota)*	**Favourable** Maintain
	Species	Bar-tailed godwit (*Limosa lapponica)*	**Favourable** Maintain
	Species	Waterfowl assemblage	**Favourable** Maintain
Rathlin Island SPA	Species	Peregrine falcon (*Falco peregrinus)*	**Favourable** Maintain
	Species	Black-legged kittiwake (*Rissa tridactyla*)	**Favourable** Maintain
	Species	Common guillemot (*U. aalge)*	**Favourable** Maintain
	Species	Razorbill (A*. torda*)	**Favourable** Maintain
	Species	Sea bird Assemblage	**Favourable** Maintain
Belfast Lough SPA	Species	Common Tern (*Sterna hirundo*)	**Favourable** Maintain
	Species	Arctic Tern (*Sterna paradisaea*)	**Favourable** Maintain
Rathlin Island MCZ	Species	Black Guillemot (*C. grylle)*	**Unfavourable** Recover
Lough Foyle ASSI	Species	Eider (Genera s*omateria*)	**Favourable** Maintain
	Species	Great Crested Grebe (*P. cristatus*)	**Favourable** Maintain
	Species	Greylag Goose (*A. anser*)	**Favourable** Maintain
Bann Estuary ASSI	Species	Breeding Bird Assemblage	**Favourable** Maintain
Rathlin Island ASSI	Species	Fulmar (*F. glacialis*)	**Unfavourable** Recover
	Species	Herring Gull (*L. argentatus*)	**Unfavourable** Recover
	Species	Lesser Black-backed Gull (*L. fuscus)*	**Favourable** Maintain
	Species	Atlantic Puffin (*F. arctica*)	**Unfavourable** Recover

Larne Lough ASSI	Species	Roseate Tern (*Sterna dougallii*)	**Favourable** Maintain
Outer Belfast Lough ASSI	Species	Cormorant (*P. carbo*)	**Favourable** Maintain
	Species	Red-breasted Merganser (*M. serrator)*	**Favourable** Maintain
	Species	Ringed Plover (*Charadrius hiaticula*)	**Favourable** Maintain
	Species	Turnstone (*Arenaria*)	**Unfavourable** Recover

2.2. Marine mammals and benthic species.

To help achieve the conservation objectives and favourable status for all marine mammal species designated within this management plan, species are examined from a strategic transboundary perspective as many individual species occur within multiple SACs and experience similar common threats and pressures either in breeding locations or in foraging areas of the sea (Howells *et al.,* 2022). Marine mammal species travel to and from the multiple coastal locations along the North Coast – North Channel MPAs management plan area at various times of the year to breed and search for food. Two important protected areas for marine mammal species located within the management plan area are Slieve Tooey/Tormore Island and Loughros Beg Bay SAC and the Skerries and Causeway SAC.

The Slieve Tooey/Tormore Island and Loughros Beg Bay SAC is an extremely important area for grey seal *(H. grypus)* and common seal *(P. vitulina)* populations as the remote cliffs and sea caves are often used as haul out sites for both species, with grey seals (*H. grypus*) using the various sea caves within this site to breed.

The Skerries and Causeway SAC, located along the northern coast of NI, is in a prime location due to the nutrient rich waters from the Irish Sea transported by the strong tidal flows of the North Channel and the warmer waters delivered by the Gulf Stream. A variety of marine mammal species are recorded within this SAC because of these effects (DAERA, 2017b). The Harbour porpoise *(P. phocoena),* as mentioned previously, has been recorded within SAC consistently and year-round, proving the area is of high biological importance to the species.

Table 5: North Coast – North Channel Marine Mammals Republic of Ireland.

Area	Feature Type	Feature	Condition Status
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	Species	Grey Seal (*H. grypus)*	**Favourable** Maintain

Table 6: North Coast – North Channel Marine Mammals Northern Ireland.

Area	Feature Type	Feature	Condition Status
Skerries and Causeway SAC	Species	Harbour porpoise (*P. phocoena)*	**Favourable** Maintain
Maidens SAC	Species	Grey seal (*H. grypus)*	**Favourable** Maintain

Ocean quahogs (*Arctica islandica*) are large, slow growing clams distributed on the continental shelf around the north Atlantic. Ocean quahogs inhabit mainly sand and silt bottom areas where temperatures are relatively low. They are very long lived with estimates of 200 years for the oldest individuals (Thorarinsd´ottir and Jacobson, 2005).

Table 7: North Coast – North Channel Benthic Species and Habitats Northern Ireland.

Area	Feature Type	Feature	Condition Status
Red Bay SAC	Habitat	Maerl bed (*Phymatolithon calcareum*)	**Favourable Maintain**
Outer Belfast Lough MCZ	Species	Ocean quahog (*Arctica islandica*)	**Unfavourable** Recover

2.3. Intertidal.

Much of the nearshore areas of this region are composed of intertidal rocky coastlines, supporting species which rely on the secure rocky outcrops and the tidal pools they form, such as chitons, barnacles, and seaweeds. Protected areas like the Bunduff Lough and Machair/Trawalua/Mullaghmore SAC, the Bann Estuary SAC and Larne Lough SPA are all important locations that have been designated as such due to their qualifying intertidal features.

Figure 8: Image of Arran Island (Donegal) Cliffs SAC (© arranislands.ie, 2012).

Banduff Lough and Machair/ Trawalua/ Mullaghmore SAC contains various features of sand flats and mudflats when exposed at low tide, with large shallow inlets, bays and reefs; all listed as Annex I features under the E.U Habitats Directive (NPWS, 2015c).

Bann Estuary SAC, located at the mouth of the River Bann, is dominated by a large beach and dune system from Portstewart with smaller dunes located at Grangemore and Castlerock (DAERA, 2015b). The SAC also contains important habitat features of saltmarsh, wet grassland, salt meadows and embryonic shifting dunes (DAERA, 2015b). Larne Lough SPA is an important sea lough that extends from Larne town in a southerly direction to Ballycarry Bridge and beyond (DAERA, 2015c). The lough contains extensive intertidal mudflats with beaches comprised of mainly sand, gravel and boulder beaches and a tidal lagoon at Glynn (DAERA, 2015c). There are also various important habitat features within the lough such as saltmarshes and wet grasslands which are important nesting locations for terns and gulls at Swan Island and Blue Circle Island (DAERA, 2015c).

Vegetated Sea cliffs provide an environment to enable species to move freely throughout the North Coast by providing nutrition and shelter. Two locations within the management plan area with important reef and sea cliff features are Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC and Aran Island (Donegal) Cliffs SAC (Figure 8).

The Aran Island (Donegal) Cliffs SAC are situated about 4km west of Burtonport in Co. Donegal and encompasses the rocky sea cliffs that make up the north, west, and parts of the south coast of the Aran Islands (NPWS, 2015b). The SAC is important due to the favourable condition of exposed western cliffs and associated feature habitats such as dry heath, alpine and subalpine heaths, calcareous rocky slopes, siliceous rocky slopes, sea caves and vegetated sea cliffs (NPWS, 2015b).

Table 8: North Coast – North Channel Intertidal Republic of Ireland.

Area	Feature Type	Feature	Condition Status
Bunduff Lough and Machair/Trawalua/ Mullaghmore SAC	Habitat	Mudflats and sandflats	**Favourable** Maintain
	Habitat	Large shallow inlets and bays	**Favourable** Maintain
Durnesh Lough SAC	Habitat	Coastal lagoons	**Unfavourable** Restore
Slieve League SAC	Habitat	Vegetated sea cliffs of the Atlantic and Baltic coasts	**Favourable** Maintain
Ballyness Bay SAC	Habitat	Estuaries	**Favourable** Maintain
Sessiagh Lough SAC	Habitat	Oligotrophic to mesotrophic standing waters	**Unfavourable** Restore

Table 9: North Coast – North Channel Intertidal Northern Ireland.

Area	Feature Type	Feature	Condition Status
Bann Estuary ASSI	Habitat	Coastal saltmarsh	**Favourable** Maintain
Castle Point ASSI	Habitat	Intertidal rock	**Favourable** Maintain
Larne Lough ASSI	Habitat	Saline Lagoons	**Favourable** Maintain

2.4. Subtidal.

The North Coast-North Channel region extends from the mean high water tide mark into surface waters, extending to below the waves to pelagic and benthic habitats and the species that inhabit the area. The seas of the North Channel, as well as the species found there, are highly mobile, with the wind influencing conditions on the water's surface and ocean currents below the surface. This transports waters northward from the Irish Sea along the Scottish coast and through the North Coast-North Channel region (Davies and Xing 2003). Many species rely on ocean currents as a means of dispersing their eggs and larva, including benthic species such as

fan and horse mussels, whose larva can be dispersed from outside the North Coast-North Channel, which may be carried by ocean currents into the region.

Figure 9: Small rocky reef at the Maidens SAC (DAERA, 2017).

The more mobile species, such as pelagic fish, can move freely throughout the North Coast - North Channel, as well as between the Co. Down – Co. Louth, Argyll and the islands of the Outer Hebrides MarPAMM regions and beyond the boundaries of protected areas. The transboundary nature of the species within these habitats can make them particularly difficult to monitor.

Within the Bunduff Lough and Machair/Trawalua/Mullaghmore SAC, there are several communities of complex intertidal reefs from south of Roskeeragh Point in the west to the pier at Mullaghmore Village (NPWS, 2015c). Species associated and present within these intertidal reef systems are blue mussels (*Mytilus edulis*), rock barnacles (*Semibalanus balanoides*) and a variety of algal species (NPWS, 2015c).

Table 10: North Coast – North Channel Subtidal Republic of Ireland.

Area	Feature Type	Feature	Condition Status
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	Habitat	Reefs	**Favourable** Maintain
Aran Island (Donegal) Cliffs SAC	Habitat	Submerged or partially submerged sea caves	**Favourable** Maintain

Table 11: North Coast – North Channel Subtidal Northern Ireland.

Area	Feature Type	Feature	Condition Status
Rathlin Island SAC	Habitat	Sandbanks which are slightly covered by sea water all the time	**Favourable** Maintain
	Habitat	Reefs	**Unfavourable** Recover
	Habitat	Submerged or partially submerged sea caves	**Favourable** Maintain
Rathlin Island MCZ	Habitat	Deep seabed	**Favourable** Maintain
	Indicator	Geodiversity-Indicators of change of relative sea level	**Favourable** Maintain
Waterfoot MCZ	Species	Eel grass (*Zostera marina*) beds on subtidal sand	**Favourable** Maintain
Outer Belfast Lough MCZ	Habitat	Ocean Quahog (*Arctica islandica*)	**Unfavourable** Recover

SPAs: Republic of Ireland Conservation Objectives:

- To maintain the favourable conservation conditions of water bird species listed by the Birds Directive;
- To maintain the favourable conservation conditions of wetland habitats as a resource for the regularly occurring migratory water birds that may utilise it; and
- To maintain site-specific conservation objectives of habitats and species within Natura 2000 sites at favourable conservation conditions.

SPAs: Northern Ireland Conservation Objectives:

- To continue to enhance the current population of qualifying species.
- Improve fledgling success to enhance/maintain current populations.
- To ensure conditions of all surrounding habitats used by the qualifying species are properly maintained.
- To safeguard the integrity of the site.
- To prevent significant disturbances of the qualifying species, and
- To provide long term protection for:
    - Species populations within the site,
    - Species distribution within the site,
    - Species habitat distribution, and
    - All other supporting processes of habitats positively supporting the species (DAERA, 2015d).

SACs*:* Republic of Ireland Conservation Objectives:

- To maintain or restore favourable conservation status of habitats or species of community or conservational interest.
- To maintain site specific conservation objectives of habitats and species within Natura 2000 sites at favourable conservation conditions.

SACs Northern Ireland Conservation Objectives:

Reefs:

- Maintain and enhance, as appropriate the extent of the reefs.
- Allow the natural processes, which determine the development, structure, function and extent of the reefs, to operate appropriately.
- Maintain and enhance, as appropriate, the species diversity within this habitat.

Submerged or partially submerged sea caves:

- Maintain and enhance, as appropriate the extent of the submerged or partially submerged sea caves.
- Allow the natural processes which determine the development, structure, function and extent of the submerged or partially submerged sea caves, to operate appropriately.

Vegetated sea cliffs of the Atlantic and Baltic coasts:

- Maintain the extent of vegetated sea cliff subject to natural processes Allow the natural processes which determine the development and extent of vegetated sea cliffs to operate appropriately.
- Maintain and enhance, as appropriate, range of maritime rock crevice and cliff ledge communities.
- Maintain and enhance, as appropriate, range of sea-bird cliff communities.
- Maintain and enhance, as appropriate, range of maritime grassland communities.
- Maintain and enhance, as appropriate, range of maritime heath communities.
- Maintain and enhance, as appropriate, range of transitions and other communities. No increase in status of non-native species, undesirable invasive species and species not characteristic of typical communities.
- Maintain and enhance, as appropriate, status of rare and notable species Monitor cliff top or near cliff management activities to ensure they do not lead to loss or enrichment of sea cliff associated species.

Sandbanks, which are slightly covered by seawater:

- Allow the natural processes, which determine the development, structure and extent of sandbanks that are slightly covered by sea water all the time, to operate appropriately.
- Maintain and enhance, as appropriate, the species diversity within this habitat.
- Maintain the extent and volume of sandbanks, which are slightly covered by seawater all the time, subject to natural processes (Source DAERA, 2020).

MCZs Northern Ireland:

These differ between the different MCZs within the North Coast – North Channel MPAs Management Plan area. An example from the Rathlin Island MCZ is highlighted below:

Rathlin Island is designated a MCZ for the broadscale habitat deep-sea bed, the bird species Black Guillemot (*C. grylle*) and Geological/Geomorphological features indicating past change in relative sea level (such as submerged paleo-lagoon, cliffs, gullies and sea arches).

Conservation Objectives (DAERA, 2016b):

As the Deep-sea bed feature in Rathlin MCZ is currently in favourable condition, the Department recommends that the conservation objectives are set to maintain this feature in favourable condition.
The Black guillemot breeding surveys showed a decline in numbers between 2000 (212 adults) and 2013 (129 adults). More survey work is needed to determine if this

is a natural feature of the Rathlin population or whether management measures as part of the MCZ process are required to mitigate against the decline. Therefore, as the Black guillemot feature in Rathlin MCZ is currently in unfavourable condition, the Department recommends that the conservation objective is set to recover this feature to favourable condition
As the Geodiversity features in Rathlin MCZ are currently in favourable condition, the Department recommends that the conservation objectives are set to maintain these features in favourable condition.

3. Legislative framework.

Legislation in RoI.

Currently in the RoI, MPAs only exist in the form of SPAs and SACs under the EU's Habitats and Birds Directive, collectively referred to as Natura 2000 sites; Europe's largest network of sites designated to protect endangered terrestrial/marine species (Classen, 2020). The ongoing discussions and work by the RoI Departments around MPAs, and the ongoing recognised need for legislation to create domestic MPAs will help to enhance RoI commitments to maritime designated features protection. This work begun with the publication of the first Irish Marine Spatial Plan, the National Marine Planning Framework (NMPF) and formally launched on the 1st of July 2021. The framework aims to cover a maritime area of approx. 495,000km² and sets out goals of protecting marine features up to the year 2040 (Marine Institute, 2022a). Full policy details for the RoI have been attached in Appendix 4.

Table 12: RoI Policy Summary.

	Policy	Summary
International	**OSPAR Convention 1992**	Aims to develop an ecologically coherent network of well-managed MPAs and provides a mechanism to protect the marine environment of the North-East Atlantic.
	Convention on Wetlands of International Importance; Ramsar Convention 1971	Focuses on the sustainable use of wetlands, to ensure their effective management.
	Marine Strategy Framework Directive 2008/56/EC	Aims to protect the marine environment more effectively across Europe.
	Marine Strategy Regulations 2010	Aims to achieve clean, healthy, safe, productive and biologically diverse oceans and seas.

	The Floods Directive 2007/60/EC	Manages risk from all types of floods (fluvial, pluvial, sea water, groundwater, artificial water bearing infrastructure.
	The EU Birds Directive 2009/147/EC	Aims to protect listed rare/vulnerable species, regularly occurring migratory birds and wetlands, especially of international importance. Marine Species listed under Annex I of the Directive.
	The Habitats Directive (92/43/EEC)	Aims to conserve biodiversity by maintaining or restoring certain habitats and species at a favourable conservation status. SACs are designated for habitats and species listed under Annex I and II.
	Water Framework Directive 2000/60/EC	Member States must aim to achieve good chemical and ecological status in identified water bodies. This includes transitional (estuarine) and coastal waters out to one nautical mile.
National	**Wildlife Act 1976 to 2022 (Revised)**	Natural Heritage Areas (NHAs) may be established to protect habitats or species.
	Foreshore Act 1933	A foreshore licence is required by any person proposing to place any material or to place or erect any articles, things, structures, or works in or on foreshore or to get and take any minerals in foreshore or to use or occupy foreshore for any purpose unless exempt under other legislation or due to existing rights.

Legislation in NI.

The Northern Ireland Executive, through DAERA, is committed to the continued development and enhancement of a well-managed and ecologically coherent network of MPAs from a devolved perspective and through the UK's contribution to the OSPAR network. In NI, multiple MPAs have been designated under both international and national legislation and are maintained to satisfy these obligations. These have been summarised in the table below, with full policy details attached in Appendix 4.

Table 13: MarPAMM North Coast- North Channel NI Policy Summary.

	Policy	Summary
International	**OSPAR Convention 1992**	Aims to develop an ecologically coherent network of well-managed MPAs and provides a mechanism to protect the marine environment of the North-East Atlantic.
	Marine Strategy Regulations 2010	Sets out a comprehensive framework for assessing, monitoring and enforcement across the UK's seas to achieve the shared vision for 'clean, healthy, safe, productive and biologically diverse ocean and seas'.
	The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009	Manages risk from all types of floods (fluvial, pluvial, sea water, groundwater, artificial water bearing infrastructure.
	The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017	Sets out the management of the 'water environment' including rivers, lakes, transitional waters, groundwater, and coastal waters out to 1 nautical mile (12 nautical miles for chemical status, i.e., for territorial waters).
	The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019	Habitats Directive requires Member States to take measures that contribute to the conservation of biodiversity by maintaining or restoring certain habitats and species at a favourable conservation status. SACs are designated for habitats and species listed under Annex I and II.
National	**The Marine Act (Northern Ireland) 2013**	The Marine Act (Northern Ireland) 2013 establishes a strategic system of marine planning within the inshore region (out to 12 nautical miles) and helps to streamline the process of marine licensing. Also allows for the conservation of nationally important marine features and the designation of MCZs.

	Marine and Coastal Access Act 2009	In NI DAERA's Marine and Fisheries Division are responsible for licensing of activities related to construction, deposition or removal of any substance or object as the marine planning process.
	Marine Policy Statement 2011	The framework for preparing Marine Plans and taking decisions affecting the marine environment.
	The Environment (Northern Ireland) Order 2002	Provides protection of nationally important flora and fauna within NI through the designation of ASSIs.
	Water (Northern Ireland) Order 1999	Under the Water (Northern Ireland) Order 1999, the discharge of trade or sewage waste to any waterway, or any water contained underground requires the consent of the Department of Agriculture, Environment and Rural Affairs. This includes waste from any commercial, industrial or domestic premises not connected to the public sewer.
	Nature Conservation and Amenity Lands Order (Northern Ireland) 1985	Provides the legislation to designate AONB
	The Wildlife (Northern Ireland) Order 1985 (as amended)	Prohibits the intentionally killing, taking or injuring of certain species of wild birds and animals or the intentional destruction, uproot or picking of certain wild plants. It is an offence to release into the wild non-native invasive species as listed in Schedule 9 Part II of the Order.

4. Management tactics.

4.1. Management goals and objectives.

This management plan can be used as a tool by both statutory and local authorities to ensure requirements established through the UK Marine Strategy, Marine Strategy Frameworks Directive and OSPAR agreements are fulfilled in future management decisions. It is also a reference for those wishing to develop or use the area, to determine if their proposed activities are compatible whilst considering the multiple social and economic dependencies of the plan area.

MarPAMM MPAs Management Plans are non-statutory, they work in line with existing statutory and non-statutory marine and coastal management governance, i.e., implementation of Draft Marine Plan 2013 and National Marine Planning Framework 2021. This will help to establish management guidance for the management plan, as well as integrating wider marine management through marine spatial planning and coastal zone management. The management plan appraises each activity that could have a potential impact on the conservation interests of an area. This will identify current legislative policy relating to the regulation of each activity, and provides future management suggestions, based on existing legal framework within the site.

This management plan takes an integrated perspective on resilience and sustainable development, considering the needs of all marine users to aid more enlightened management approaches. Cross–disciplinary management guidance was developed through stakeholder engagement and supported the work packages outputs from MarPAMM on seabirds, marine mammals, and coastal processes. The process by which it has been derived has built partnerships and opened lines of communication between those who have a direct interest in the area. The management plan is to be considered a 'living document' and can be adapted to reflect the continually changing needs of the MPAs and surrounding areas.

This management plan uses an approach based on an ecosystem management system by Sardá *et al*., (2017) defined "*As the conservation of the species, habitat or ecosystem structure and functioning to maintain long-term and resilient ecosystem services."* This will ensure the long-term sustainability required to continue providing essential ecosystem services to the environment and society during periods of unexpected risk or change. This interdisciplinary approach recognises the integration of governance principles, human influences, and ecological requirements within complex social-ecological systems. This approach has been emphasised by the benefits mapping infographic for the Regional Steering Group for this management plan, which can be found in Appendix 1.

Table 14: Policy summary table North Coast – North Channel MPAs Management Plan.

Policy Area	Section Pages Numbers	Management Summary
Commercial Fishing	4.1- pg 31 4.2- pg 49	Provides an oversight of statutory commercial fisheries regulations from Departments in NI and RoI. Additionally creates guidance for non-statutory management measures to enhance MPA integrity from commercial fishing activities.
Aquaculture	4.1- pg 32 4.2- pg 52	Sets out a contextual background for commercial aquaculture operations within the Region. Provides an oversight of statutory aquaculture regulations from Departments in NI and Roi. Additionally creates guidance for non-statutory management measures to enhance MPA integrity from commercial aquaculture, including farming and intertidal activities.
Benthic Dredging and Disposals	4.1- pg 36 4.2- pg 55	Sets out a contextual background for dredge and disposal operations within the Region. Provides an oversight of statutory Benthic Dredging and disposal regulations from Departments in NI and RoI. Additionally, creates guidance for non-statutory management measures to enhance MPA integrity from commercial dredging operations.
Recreation and Tourism	4.1- pg 37 4.2- pg 56	Sets out the key recreational activities that occur within MPAs and adjacent areas within the Region. Provides an oversight of statutory policy implications recreational users should follow. Additionally creates guidance and existing codes of conduct for non-statutory management measures to enhance MPA integrity.
Renewable Energy	4.1- pg 38 4.2- 63	Sets out the background for the growth of maritime renewable energy developments within the region. Provides an oversight of statutory Benthic Dredging and disposal regulations from Departments in NI and RoI, including EIA and Appropriate Assessment. Additionally creates guidance measures to aid integration with features and habitats to enhance MPAs and adjacent area integrity for renewable energy developments.
Oil and Gas	4.1- pg 42 4.2- pg 66	Sets out the background of the Memorandum of Understanding of no oil and gas exploration in NI and the policy for no exploration of oil and gas in the RoI. Additionally, if these were removed it sets out non-statutory guidance to help enhance priority features in adjacent areas to MPAs.

Marine Infrastructure, Ports and Harbours	4.1- pg 42 4.2- pg 66	Sets out a contextual background for marine infrastructure, ports and harbours within the Region. Provides an oversight of statutory regulations from Departments in NI and RoI. Additionally, creates guidance for non-statutory management measures to enhance MPAs and adjacent area integrity.
Climate Change, Coastal Processes and Shoreline Change	4.1- pg 44 4.2- pg 68	Sets out the background for the growth of risk from Climate change within marine and coastal areas. Provides an oversight into potential responses which focus on managed realignment using 'Nature Based Solutions' and the use of Blue Carbon for carbon sequestration. Additionally creates guidance measures to aid environmentally friendly responses to risk which could aid and enhance species and habitats within MPAs and adjacent area integrity.
Research and Education	4.1- pg 46 4.2- pg 72	Sets out a contextual background for research and education work with MPAs. Provides an oversight of statutory regulations from Departments in NI and RoI. Additionally, creates guidance for non-statutory management measures to enhance MPAs and adjacent area integrity from interactions such as Citizen Science.
Ballast Water and Accidental Offshore Discharges	4.1- pg 46 4.2- pg 73	Sets out a contextual background for ballast water and accidental discharge within the Region. Provides an oversight of statutory regulations from Departments in NI and RoI. Additionally, creates guidance for non-statutory management measures to enhance MPAs and adjacent area integrity.
Land-Use Sediment Run-off	4.1- pg 47 4.2- pg74	Sets out a contextual background for land use sediment run-off and coastal development within the Region. Provides an oversight of statutory regulations from Departments in NI and RoI. Additionally, creates guidance for non-statutory management measures to enhance MPAs and adjacent area integrity.
Wild Seaweed Foraging and Cultivation (Farming)	4.1- pg 47 4.2- pg 75	Sets out a contextual background for wild seaweed foraging and cultivation within the Region. Additionally, creates guidance for non-statutory management measures for foraging and cultivation based on working examples from England and historic DAERA 2007 guidance on seaweed foraging.
Military and Defence	4.1- pg 48 4.2- pg 79	Sets out a contextual background for military and defence operations within the Region. Provides an oversight of statutory regulations from Departments in UK, NI and RoI.

Strategic Guidance 1: Commercial Fishing.

Overview of Commercial Fishing NI/RoI.

Within the North Coast - North Channel region, commercial fishing is undertaken through potting for brown crab and lobster, dredging for scallops and limited whitefish landing through by-catch. Commercial fishing plays an important role within the economies of the NI and RoI, with fish processing in NI accounting for an estimated turnover of £90 million (DAERA, 2020). Over the past 10 years there has been a 39% increase in fish processing through micro-enterprises (Seafish, 2019). There is significant cross-border trade within the sea-food industry on the island of Ireland, with £26 million of seafood exports going from NI to the RoI (DAERA, 2021b). With regards to imports, £31 million of seafood imports into NI come from the RoI (DAERA, 2021b).

Across the RoI, the Irish commercial fishing industry is worth about €1.22 billion annually, with the industry employing around 16,000 people in fishing, processing, sales and marketing (Fishing Daily, 2019). Landings to Irish ports have been valued at €275 million in 2019 which was an increase of 15% on the previous years (Fishing Daily, 2019).

Within the RoI, Donegal Bay is one of the main areas for landings of Sole using beam and otter trawlers between 2016-2020. The total amount of catch for Sole is 629 tonnes and 61 tonnes of discard (Marine Institute, 2021). Donegal Bay is one of the main areas for landing of sprat through pelagic trawling in the south (Kerry Bays) and southwest (Dunmore East) of RoI and Donegal Bay (Marine Institute, 2021).

Table 15: Sole in Division 7a. Catch distribution by fleet in 2021 as estimated by ICES.

<table>
<tr><th>Total Catch</th><th colspan="3">Landings</th><th>Discards</th></tr>
<tr><td rowspan="3">600 tonnes</td><td>Beam trawlers</td><td>Otter trawlers</td><td>Other gears</td><td rowspan="3">61 tonnes</td></tr>
<tr><td>87%</td><td>12%</td><td>< 1%</td></tr>
<tr><td colspan="3">629 tonnes</td></tr>
</table>

Overall, the fishing fleet in NI is aging in comparison with other fleets in the UK, consisting of 140 over 10m vessels; around 200 vessels of smaller scale and three large pelagic vessels over 50m (DAERA, 2021b). Most of the fishing vessels on the north coast are inshore potting for crab and lobster (low impact), with one local and multiple visiting vessels (i.e., Scotland) targeting scallops. Within NI, the targeting of whitefish is generally undertaken by 3 vessels, based on the eastern coast outside of

the management plan, they may undertake small scale trawling off the Co. Antrim and Co. Donegal coast, but their intensity is considered low within and adjacent to MPAs.

Within the North Coast – North Channel region, ports and harbours that support commercial fishing are generally small with reported average landings value of <£1,000,000 in NI, i.e., Portrush <£200,000 and Red Bay <£200,000 (Seafish, 2021). In the RoI smaller ports (Malin and Portnablagh etc.) are limited to small operations using less than 3 - 4 vessels. Large ports and harbours for commercial fishing are in Greencastle and Killybegs Co. Donegal, Londonderry/Derry Co. Londonderry and Belfast Co. Antrim. Large ports in NI are classified as sites that support commercial fishing vessels and have average reported landings of >£1,00,000 (Seafish, 2021). Killybegs is one of the largest fishing ports in Ireland and mainly cultivates pelagic and white fish species, while Greencastle in is one of the largest white fish ports in Donegal (IFF, 2022). There is commercial fishing activity within Larne Port.

Fishing is generally undertaken by the inshore fleet which uses relatively small vessels and low sea-bed impact static gear, operating widely dispersed with a concentration of ten NI vessels in Greencastle, Co. Donegal (DAERA, 2021b). Fishing activity referred to in this management plan is undertaken generally by operators within the North Coast fleet (DAERA, 2021b). Inshore static potting is usually conducted by vessels of 10m or under and with limited VMS recording facility, although DAERA are proposing the introduction of mandatory i-VMS in the future. This management plan is mainly relevant to the inshore fleet targeting shellfish. Whitefish is extremely limited within this management plan, evidenced by only a few hundred tonnes of most whitefish species landed in 2019 across NI, (DAERA, 2021b). The pelagic fleet (NI) doesn't fish around the north coast of NI, but further around the coast in RoI and Scottish waters, with landings in Killybegs.

Commercial fishing practices should aim to mitigate and adapt to responsible fishing and landing methods which put the integrity of MPAs and designated features at forefront of best practice. Reducing or limiting unintended and/or inadvertent impacts is required to reduce pressures on MPAs. Reducing impact on MPA features will have ecosystem benefits, including recovery, restoration, and the preservation of commercial fish stocks, thus meeting the requirements of the Fisheries Act (Northern Ireland) 1966 and Fisheries (Consolidation) Act 1959 (RoI). Competent authorities including DAERA, DAFM, AFBI and the Marine Institute, should work with the commercial fishing industry to introduce mitigation measures for designated features to help reduce adverse impacts within this strategic area. Commercial fishing

operations should adhere to the recommendations and guidance laid out within section 4.2.

Strategic Guidance 2: Aquaculture.

Overview of Aquaculture NI and RoI.

Aquaculture within the NI areas of the North Coast – North Channel region are generally shellfish within the sea loughs of Lough Foyle, Larne Lough, and Belfast Lough, and salmon (*Salmo salar*) within Glenarm Co. Antrim. The main source of cultivation is from blue mussels (*M. edulis*), Pacific oyster (*Magallana gigas* formerly known as *Crassostrea gigas*) (DAERA, 2021c) and salmon (*S. salar*). In 2019, the two main shellfish species in NI produced just over 3,000 tonnes valued at over £4 million and directly employed 31 full time and 58 part time staff (AFBI, 2023). Table 14 and Table 15 show the total tonnage for shellfish production and value for Northern Ireland from 2019 and 2020. In 2019 shellfish production grew to a value over £4.4 million and 2020 shows a decline to under £3.7million, this decline can be attributed to the impact of the COVID-19 Pandemic.

Table 16: 2019 figures for shellfish production in Northern Ireland.

SPECIES	TONNAGE PRODUCED (Metric Tonnes)	VALUE (£)
Blue Mussels (market)	695	£1,390,000.00
Pacific oysters (market)	561	£1,647,999.00
Pacific oysters (on-growing)	541	£1,454,648.00
TOTAL SHELLFISH	**1,797.00**	**£4,492,647.00**

Table 17: 2020 figures for shellfish production in Northern Ireland.

SPECIES	TONNAGE PRODUCED (Metric Tonnes)	VALUE (£)
Blue Mussels (market)	674	£ 882,000.00
Pacific oysters (market)	494.95	£ 1,619,114.40
Pacific oysters (on-growing)	377.49	£ 1,141,950.00
TOTAL SHELLFISH	**1,546.44**	**£ 3,643,064.40**

Larne Lough is a sea lough on the east coast of NI, enclosed by the peninsula of Islandmagee. The lough is 8 km^2 and has a maximum depth of 13 m. There are six

licensed sites within the lough, with subtidal aquaculture through the bottom culture of blue mussel (*M. edulis*) and intertidal aquaculture with trestle culture of Pacific Oyster (*M. gigas*), covering an area of 0.9 km (AFBI, 2015a).

Belfast Lough is a shallow semi-enclosed bay on the east coast of NI and covers total area of 130 km^2, with a maximum depth of 19 m. There are 12 licensed sites for subtidal aquaculture through bottom culture of blue mussel (*M. edulis*), covering an area of 7.5 km^2 (AFBI, 2015b).

Larne Lough and Belfast Lough are designated as Shellfish Water Protected Areas, for the protection of shellfish growth and production (DAERA, 2017c). These areas are managed by River Basin Management Plans through the application of Water Framework Directive Protected Areas, for the protection of economically significant aquatic species. The protected areas are regulated by The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, post UK withdrawal from the EU.

Lough Foyle is a shallow coastal embayment of approximately 179 km^2 at the mouth of the river Foyle on the north coast of Ireland. The Lough borders NI and RoI, with an average depth of 5m, a catchment of 3,700 km^2, and intertidal mudflats covering 20% of the area (AFBI, 2015c). The Lough is defined as starting seaward of Culmore Point in Co. Londonderry, with a series of mudflats, deeper channels and poorly sorted sands and gravels (AFBI, 2015c).

Historically Lough Foyle has been harvested for native oyster (*Ostrea edulis*) from the 18th Century, with the fishery reliant on spat production and settlement onto natural oyster beds as a self-propagating wild fishery (Ferreira *et al.,* 2022). Within the lough a traditional wild dredge fishery is operated for native oysters (*O. edulis*). Due to the cross-border (NI and RoI) spatial extent of Lough Foyle, fishery licensing for native oysters is conducted by the Loughs Agency, with about 50- 60 licenses per year. The fishery catches approximately 100- 150 tonnes annually, which is valued at £400,000 per annum (Ferreira *et al.,* 2022). Fishing is not permitted between 1st April – 18th September.

Blue mussels (*M. edulis*) are grown to marketable size in Lough Foyle though dredged seed mussel from wild mussel seed beds in the Irish Sea (Ferreira *et al.,* 2022). From

2008, the bottom grown mussel industry has been largely dormant, but reconvened in 2015 with anecdotal report landings valued at approximately €1500/tonne (Ferreira *et al.,* 2022). Lough Foyle has demonstrated growth in the cultivation of Pacific Oysters (*M. gigas*), grown through traditional bag and trestle farms with the seed originating in hatcheries in the UK or France (Ferreira *et al.,* 2022). Due to the limitation of excluding aquaculture from the Foyle and Carlingford Fisheries Order 2007 in NI and RoI, activities for blue mussel (*M. edulis*) and Pacific Oyster (*M. gigas*) farming in Lough Foyle are unlicensed. The problem arises from the ownership of the foreshore, seabed and estuary which are disputed, this has resulted in the lack of authority for the Loughs Agency to issue aquaculture licences.

Within the RoI, one of the most active locations within the management plan for aquaculture is Donegal Bay, where in 2021, approx. €268,000 in government grants were distributed over eight resident aquaculture businesses to enhance further aquaculture activities within the area. Aquaculture within Donegal Bay is conducted on intertidal licensed sites for Pacific oyster *(M. gigas)*. In 2020, aquaculture activities within Donegal Bay generated €10.6 million turnover (BIM, 2022a). Mulroy Bay (Co. Donegal) is an important location for the cultivation of salmon (*S. salar*). There are some localised fish farm aquaculture operators for salmon located in Lough Swilly (IFF, 2022). Rope grown mussels, scallops and Native oysters (*O. edulis*) are also cultivated within Mulroy Bay (Marine Institute, 2022b). Seven licenced companies operate within Mulroy Bay and aquaculture activities within the bay generated €5.8 million in turnover in 2020, with the finfish productions accounting for the majority of the bay's turnover (BIM, 2022b).

It is essential that prior to any aquaculture related activities that the correct licencing is obtained and pre-application survey work completed, with mitigation plans to limit negative impacts on the marine environment. This process will ensure that aquaculture is managed in an appropriate way, to avoid damage to designated features and adjacent areas. This will help to limit negative environmental impacts, such as the removal of important prey sources for nesting waterbirds or damage to intertidal habitats with oyster trestles (NPWS, 2012).

In NI, the Marine and Fisheries Division of DAERA, is responsible for the approving of fish culture licences, shellfish fishery licences and marine finfish fishery licences under the Fisheries Act (NI) 1966 (Poppleton *et al.,* 2021). In the RoI, the Department Agriculture Food and the Marine is responsible for aquaculture licensing under the Fisheries (Amendment) Act, 1997 and Foreshores Act (1933 - 2011). In the case of aquaculture developments being proposed in areas within or adjacent to protected MPAs, these generally will require an Appropriate Assessment to examine any

potential impacts on designated features. The Marine Institute and the Agri-Food and Biosciences Institute provide scientific advice on Marine and Aquaculture environment issues, carrying out relative scientific reports. In cases where an Environmental Impact Assessment (NI) or Appropriate Assessments indicates negative issues, these reports can help to create mitigation measures for the management plan area. EIAs for aquaculture in NI are handled under Marine Licence EIA regulations and are only applicable to marine finfish, which is applicable in NI to salmon cages in Glenarm and Red Bay.

Along coastal areas, aquaculture operations existed prior to this legislation, therefore RoI is assessing both existing and proposed aquaculture and fishing activities in all designated sites. This is a cumulative process, as agreed with the European Commission in 2009, and will eventually include all fishing and aquaculture activities in all Natura 2000 sites (Poppleton *et al.,* 2021).

Intertidal hand gathering of shellfish refers to the collection of wild shellfish from the shore without the aid of mechanised equipment. In Northern Ireland this is predominantly for periwinkles but also includes cockles, native oysters and blue mussels (DAERA, 2022a). The activity is common and is undertaken for both personal consumption and as a commercial activity. Intertidal hand gathering of shellfish is currently unregulated by DAERA and as a result, the Department holds limited information on the commercial scale of this fishery (DAERA, 2022a).

Aquaculture operators within NI and RoI, undertaking shellfish farming in either new or existing developments must follow the conditions and mitigations set out within the required licence. Aquaculture developments should operate within appropriate departmental guidance which states that no significant adverse effects, directly, indirectly, or cumulatively on the seabed, designated features, species, wider biodiversity interests or environmental carrying capacity must occur. Aquaculture operators should adhere to the considerations set out in actions in 4.2.

Figure 10: Representative example of a Salmon Farm (Marine Institute, 2022).

Strategic Guidance 3: Benthic Dredging and Disposals.

Dredging operations with regards to the maintenance of ports, harbours, and shipping lanes along and adjacent to the management plan area are required to ensure existing navigational channels/berths are maintained on a regular basis and remain operational for safe vessel navigation (DAERA, 2017d).

Dredging operations occur in two stages:

1. the removal of benthic material from the seabed and
2. the redepositing of dredged material in another predetermined location.

In most cases these dredging operations will require a marine licence. There are a few licensed locations that undertake activities that do not require a licence:

- Dredging and/or disposal is authorised by and carried out under Harbour Order.
- Marine Licencing Authority is satisfied that the dredged material is not hazardous; and
- Materials deposited are for land reclamation, or flood risk prevention and managing waterways or sediments are relocated inside surface waters (plough dredging).

Dredged material must be tested for contaminated sediments prior to obtaining any operating licences or before the redistribution of freshly dredged materials. All

contaminants must be identified through appropriate testing of sediment samples along with an assessment against safety limitations for specific chemicals (DAERA, 2017d). The OSPAR Guidelines for the Management of Dredged Material advise that all sampling of dredged materials should be carried out every 3 years in any area where dredging is a regular occurrence and where polluted sediment has been discovered (DAERA, 2017d). Dredge operators should adhere to the considerations set out in actions in 4.2.

Strategic Guidance 4: Recreation and Tourism.

Shoreline based recreation.

Within the management plan area, there is a wide range of recreational activities including angling, abseiling, kite buggies, coasteering, dog-walking, bird watching, camping, and hiking that take place close to designated MPAs. Shoreline based recreational activities within the management plan area should be conducted with an awareness to implications of anthropogenic interactions with MPAs and adjacent areas. The focus of this guidance is to highlight the potential risks that recreational activities have on MPAs, and the impacts associated with local communities and visitors, by providing education to recreational users as to how they can minimise their level of impact. MarPAMM has created a story map to raise awareness of MPAs and provide this education.

This story map can be accessed at:

https://storymaps.arcgis.com/stories/e32db16f15504e1db04c68443e418df1

In MPAs with sensitive features, recreational users should adhere to the recommendations in this management plan which are based on DAERA and DHLGH policy, along with appropriate codes of conduct. Recreational users should adhere to the recommendations in this management plan, which will help lead to the enhanced integrity of the MPAs and surrounding habitats while aiding in the conservation of MPAs and their networks. In addition, shoreline based recreational activity users should adhere to the considerations set out in actions in 4.2.

Surface based recreation.

Within the management plan area, there is a wide range of recreational activities, which represent a significant amount of tourism assets. Surface based activities include coastal canoe trails (i.e. from Ballycastle to Larne), paddle sports (kayaking, stand up paddle boarding and rowing), sailing, wind and kite surfing, surfing, recreational fishing, jet-skiing and pleasure boating/cruising.

Surface based recreational activities represent a significant asset for social-economic benefits; however, there are negative associations with certain activities concerning wildlife disturbances and degradation of designated features. Recently, MarPAMM stakeholders have highlighted concern with the increasing impact of jet-skis within marine areas. Jet- skis launch from beach locations, are notorious for operating at speed within shallow areas, and are associated with disturbances of protected features (marine mammals) (Oakley *et al.,* 2017). Disturbance occurs through the direct or indirect interaction with people that causes changes in the behaviour of an animal, which could affect their well-being or survival in the short, medium, or long term. This might include direct injury (e.g., collisions, propeller damage), changes in distribution, disruption of natural behaviours (communication, migration, breathing, breeding, nursing, feeding or resting), excessive use of energy and eventual loss of condition caused by continual or repeated avoidance. Increased vulnerability of an individual or population to predators, damage to habitat and chronic stress, can impact on an animal's health (e.g., immune, digestive, and reproductive functions). The main pressures associated with pleasure boating and cruising are physical abrasion associated with anchoring/mooring, which can result in degradation of designated benthic features, and inappropriate interactions with marine mammals. There are examples of outdoor adventure centres (Cushendal) operating activities such as coasteering and kayaking.

Surface based recreational activities within MPAs, areas adjacent and areas containing features of archaeological or historic interest should be undertaken in a sustainable approach that causes no intentional damage to designated features or disturbances to wildlife. Anchoring in emergencies will not be restricted. As well surface based recreational activity users should adhere to the considerations set out in actions in 4.2.

Sub Aqua based recreation.

Sub-Aqua is a broad term encompassing recreational underwater activities including snorkelling, freediving, and SCUBA diving. In the RoI, the DHLGH are the responsible authority for sub aqua archaeological sites. In NI, DAERA is the responsible authority for the management and protection of wrecks and the MCA is responsible for collating reported information and salvaged materials from wreck dives.

Recreational diving can be an important tool to aid and enhance marine biodiversity recording through citizen science. Groups like Seasearch (https://www.seasearch.org.uk/), provide training for recreational divers and snorkellers through awareness and education, recording marine species and habitats within the local environment. The information collected can be uploaded to the Irish

National Biodiversity Data Centre (NBDC) and the National Biodiversity Network (NI). Data collected by citizen science can be a useful observational tool for understanding the condition of MPAs and wider ecological trends in the management plan region.

In general, recreational fishing activities (i.e., spearfishing) that occur within sub-aqua activities are regulated using the same by-laws as outlined in the shoreline-based fishing activities strategic guidance, which has been expanded in the guidance actions below. It must be noted that NPWS representatives have highlighted that spear fishing is illegal in the RoI. Sub-aqua activities within MPAs and adjacent areas should be conducted in a considerate manner that causes no intentional damage to MPA designated features. Recreational divers intending to dive within the management plan area should follow the actions outlined in 4.2.

Strategic guidance 5: Renewable Energy.

In recent years, concerns over energy supply and security, combined with the increase in the damaging effects of climate change has increased the awareness of having sustainable solutions for energy security across the island of Ireland. To help achieve this energy security, the maritime renewables energy sector is experiencing growth. The transitioning of the energy sector from Hydrocarbons to renewable resources, including offshore wind, wave and tidal generation, will significantly aid the delivery of the 2050 targets for net-zero emissions and low carbon economies.

From the NI perspective, the published 2022 Energy Strategy and the NI Climate Change Act 2022. have set out key targets for the evolution of the energy sector including,

- To meet 80% of electricity consumption from a mix of renewable resources by 2030,
- 40% of energy generation through renewable resources (mostly terrestrial) was met by the deadline of 2020, and
- To double low carbon and renewable energy economies to a turnover of more than £2 billion by 2030 (Woodward, 2022).

It is anticipated that Northern Irish departments will encourage growth in offshore renewables to help achieve 2050 carbon reduction targets.

The RoI, in line with EU energy efficiency targets, has agreed in reducing energy usage to meet the EU-wide reduction targets of 40% by 2030 and reduce overall greenhouse gas emissions by 95% (in comparison with 1990 levels) (SEAI, 2017). It

has been identified that maritime renewables could possess a key industry for the Donegal-Northwest Region.

Figure 11: Representative example of floating offshore wind turbines (Henderson, 2021).

Offshore wind developments, combined with wave and tidal energy are favoured technologies that have significant potential to meet these renewable energy targets, especially when the stronger wind speeds experienced offshore within the management plan area provide stronger electricity production (NMD, 2017).

Non statutory guidance for offshore renewable energy production in NI has been provided in 'The Regional Locational Guidance (RLG) for Offshore Renewable Energy Developments in NI Waters 2011. The Strategic Environmental Assessment for the Regional Locational Guidance was completed in 2012 and is currently being revised by the Department of the Economy. Zones of potential interest for development of the main three renewable technologies were identified based on the potential available natural resources and the technical parameters of the technologies i.e., wind speed, tidal velocity, and max water depth. The current position of live developments from the Crown Estate and North Sea Transition Authority are available in the DAERA Marine Map viewer:
https://gis.daerani.gov.uk/arcgis/apps/webappviewer/index.html?id=e44a8e27333241bfa2faf4a387fd99d7.

An example of a project in the early stages of development for offshore renewable development is the North Channel Wind 1 and 2; two prospective floating offshore windfarms proposed to be located 10-25 km from the coast of NI and comprise one of the largest energy infrastructure systems and renewable energy generators in NI (NCW, 2022). North Channel 1 is expected to generate 300MW and North Channel 2 is expected to generate approx. 100 MW. The North Coast Wind renewables project is expected to commence in 2027 and is subject to securing relevant consents and seabed leases.

Simply Blue have created a cross-border renewable energy project between Northern Ireland and Scotland (Islay and Inner Southern Hebrides). The Nomadic Offshore Wind project is a floating wind farm which is expected to generate up to 500MW of capacity or the equivalent of powering 40,000 homes (Simply Blue, 2022). The project is currently in the planning stage of development and aims to help energy security and decarbonisation across the UK (Simply Blue, 2022).

The proposed Torr Head Tidal Scheme (never developed) sited 1 km off the north Antrim coast, aimed to use 100 underwater horizontal axis turbines to generate 100 MW of green electricity (Tethys, 2020). Currently no seabed lease can be agreed with The Crown Estate until the Strategic Environmental Assessment from 2012 is updated. This work is being examined by the DfE together with a plan level Habitats Regulation Assessment. A further barrier is how residual liabilities are to be addressed in Northern Ireland waters in a case where a developer gets into financial difficulties. A ‘decommissioner of last resort’ for Northern Ireland marine waters is to be identified. Any further work within this project for the application of a Marine Licence and associated survey work will be under the developers own risk.

Developments associated with offshore renewables can be of increasing concern due to the structures, (construction, operation, or end of life phases) impacts on local biodiversity and marine habitats (SEER, 2022). Foundations, anchors and cables associated with the development of offshore wind farms have the potential to negatively alter benthic environments both during and after operations. High levels of noise from construction work have the potential to displace many aquatic species. Invertebrates can be displaced within structures of monopole (Wilhelmsson & Malm, 2008), seabird, marine mammals and fish species can have collisions with structures or machinery, and/or can become displaced by interference from construction, operational and end of life stages of hardware. (SEER, 2022).

If managed appropriately, new habitats may be created during construction that could increase invertebrate abundance and generate positive impacts on the surrounding biodiversity (SEER, 2022). The foundations of structures, anchors and exposed cables can alter biodiversity and abundance of benthic organisms, however they also become new substrates on the sea floor and within the water column that will be preferred by various organisms, which can lead to the development of new benthic habitats (SEER, 2022). An infographic about newly formed benthic habitats on the foundations of wind turbine can be reviewed in Appendix 5.

The installation and supporting infrastructure of offshore renewable energy sources should follow government guidelines, marine licencing, and marine spatial planning (including EU Directive, National Marine Planning Framework, draft Marine Plan for Northern Ireland, and UK Marine Policy Statement) and use biodiversity friendly strategies to enhance and support ecologically valuable features. These strategies should include precautionary measures to protect and enhance the integrity of the key features and/or key habitats that are based on the ecosystems approach. To achieve renewable energy development targets the DfE is leading on bring forward a new support mechanism to incentivise areas, including offshore renewable energy. The Energy Strategy Action Plan 2022 sets out 22 delivery actions that will be brought forward in 2023, one of these includes the development of an action plan to deliver 1 GW of offshore wind by 2030.

The construction, operation and maintenance of submarine cables can cause harmful damage to benthic habitats in close proximity to designated features, therefore operators must follow the developmental guidelines. Operators should employ biodiversity friendly strategies that mitigate the risk of detrimental benthic feature impacts which is based on the ecosystems approach.

Maritime renewable energy developers should undertake development, operations and disposal using adaptive management with safeguards and mitigation measures which minimise impacts to marine species and habitats. Maritime renewable energy developers and operators should adhere to the considerations set out in actions in 4.2.

Strategic Guidance 6: Offshore oil and natural gas exploration.

Currently, there is no offshore commercial production for oil and gas within the North Coast - North Channel region. In the management plan area to date, there has been minimal exploration in offshore areas, including Rathlin Island. Currently it is considered unlikely that new exploration activity for Hydrocarbons will be undertaken

across the island of Ireland. In NI, there is a governmental memorandum of understanding that there will be no new Hydrocarbon exploration. In the RoI, the Climate Action and Low Carbon Amendment Bill 2021, places a ban on new licenses for new oil and gas exploration. Currently there are no RoI Hydrocarbon exploration sites located within this management plan. Due to governmental and legislative requirements across the island of Ireland, oil and gas exploration will not be a major consideration within this management plan. However, if the circumstances arise were new oil and gas exploration was deemed appropriate, the policy and measures outlined in 4.2 should be adhered to limit the environmental impacts within inshore marine areas.

Strategic Guidance 7: Marine Infrastructure, ports and harbours.

Marine infrastructure encompasses a variety of development, which includes ports, harbours, piers, marinas, lighthouses, and navigational aids. In NI, the Department for Infrastructure (DfI) is the competent authority responsible for marine infrastructure, through the European Programmes and Gateways Unit (EPG). Responsibility for shipping services, navigation and marine safety matters remain reserved functions for the Department for Transport (London) and the Maritime and Coastguard Agency. In the RoI, DAFM is the competent authority responsible for marine infrastructure through the Irish Maritime Administration (IMA), which integrates the planning and delivery of all the maritime services. The IMA is responsible for developing the maritime transport sector, facilitating the achievement of international safety levels, and enhancing infrastructure needed to secure employment in the shipping, fishing, and leisure sectors.

The North Coast – North Channel region is one of the main maritime gateways within the UK and Northern Ireland, contributing to the European Spatial Development Perspectives Trans-European Networks (TENs) (Ritchie *et al.,* 2009). Connecting the island of Ireland to Scotland, England, and the rest of Europe, it includes NI's most important port; Belfast (Ritchie, *et. al* 2009). Belfast Port is NI's principal maritime gateway and logistics hub, with vessel operators/companies sharing over 250 shipping routes (Ritchie *et al.,* 2009). Year-round ferry crossings to Cairnryan operate out of Larne and Belfast port and there are summer crossings to the Isle of Man and Heysham. These crossings annually carry approx. 1.2 million passengers and 300,000 cars, with a further half a million freight units imported into the port of Belfast (Ritchie *et al*., 2009). Due to the significance of trade, logistics and commercial industry with the management plan area, especially towards the North Channel of the Irish Sea, there can be a large shipping presence. This will lead to continual operations necessary for operational safety through maintenance or expansion works of navigational aids, shipping channels and harbour or port infrastructure.

Generally, port operators and authorities (i.e., Belfast Port), will aim to manage their activities in a manner that will positively contribute to the environmental sustainability of the area, including enhancing ecological status. This requirement was derived from the Marine Strategy Framework Directive and is currently applicable to the RoI to 1 nautical mile for water quality but also includes issues such as litter and noise. This is now covered in NI through the UK Marine Strategy 2010, which provides the legislation for development, managing waste and water pollution within ports and harbours.

The three main harbours with high levels of commercial fishery activity located within Donegal Bay are Killybegs Harbour, Greencastle Harbour on the Inishowen Peninsula near the entrance to Lough Foyle and Burtonport which is east of Aranmore Island (IFF, 2022). Other important harbours within NI include Portrush, which has been noted for its recreational fishing, and tourism activities, and Ballycastle which provides year-round ferry crossings to Rathlin Island and summer only crossings to Campbeltown, Kintyre (Ritche *et al.,* 2009).

Across the island of Ireland, The Commissioners of Irish Lights, working through The Local Lighthouse Authorities (LLA) are the responsible authority for the management of Local Aids to Navigation (AtoN) in their area. Collectively these are known as the Harbour Authorities or County Councils. The responsibility of Irish Lights to provide AtoN does not extend to individual approaches to ports or harbours. The quality of service to all operators should be the same and Merchant Shipping and Ports legislation regulate the provision of AtoN. The duties of LLA in NI are set out in detail in the Port Marine Safety Code. AtoN include lighthouses, radio aids, buoys, beacons, poles, signs, and any other aid intended to assist safe navigation.

Marine infrastructure initiatives for various conservation projects will be important for species specific targeting. For example, within Bangor Marina the British Trust for Ornithology (BTO) in collaboration with ‘Action for Biodiversity’ on an ‘Interreg’ funded project has worked to construct 40 new nesting boxes for Black Guillemot (*C. grylle*) populations who have been nesting within the North Pier of the marina since 1911, originally constructing nests within decaying wood and concrete along the harbour (BTO, 2021).

Infrastructure, ports, and harbour developments along the management plan region should operate within appropriate departmental guidance which states that no significant adverse effects, directly or cumulatively on the seabed, designated

features, species, wider biodiversity interests or environmental carrying capacity must occur. Port and Harbour operators, as well as marine infrastructure developers should adhere to the considerations set out in actions in 4.2.

Strategic Guidance 8: Climate Change, Coastal Processes and Shoreline Change.

The impacts from increasing intensity of storm events, sea level rise and increased erosion incidents present current and future challenges within the management pan and adjacent areas, their species, and habitats. Findings from the MarPAMM coastal process work package has highlighted the potential impacts from extreme weather events, further rises in sea levels and increased erosion incidents. Although, this research was directed within the Murlough SAC, the findings have important considerations that are applicable within this management plan area. An increase in the frequency of severe weather events such as storms, flooding, erosion, and sea level rises will jeopardise the overall sustainability of all species, habitats, ecosystems services, housing, business, infrastructure, and industries. For example, in areas of sand dunes, impacts from these extreme events could create an inhospitable environment for the sensitive indigenous species and cause an increase of invasive/non-indigenous species. One of the main impacts of concern for future climatic change is the replacement of cold-water species with warm water species, with the rate of change subject to specific climate change scenarios and regional sensitivities (CCRA3, 2022).

The expected increase in severe weather events and storms is a major concern for vulnerable coastal locations both in NI and the RoI. In NI, the risk of damages to coastal locations as a direct result of climate change was examined in September 2016 by a NI Assembly, where the increase in frequency and severity of coastal flooding represented the main climate change associated risk to infrastructure (NMDDC, 2017). Currently, multiple assets in all infrastructure sectors (i.e. train infrastructure on the north-west coast). are exposed to several sources of flooding, erosion and impacts from storm events. The anticipated impacts from coastal risk are likely to double within the next 60 years in line with projected changes in the UK climate (NMDDC, 2017). This expected increase in onshore wave height will also hasten rates of coastal erosion, increasing the risk to the UK rail network and coastal sea walls.

In the RoI, findings from work packages 2, 3 and 4a from the Irish Coastal Protection Strategy (ICPS) for the northeast coast of Ireland produced a series of floodplain and flood depth maps outlining several primary areas that are at risk of coastal flood hazards. This was based on the geographic extent of the flood plain and their proximity to local communities (RPS, 2010).

The general patterns of climate change and the correlating impacts on marine species, especially to internationally important sea bird populations, is a significant trend of concern. Studies conducted by Interreg funded projects investigated the direct and indirect variables of climate related processes affecting seabirds through analysing prey abundance, weather events that alter prey behaviour, quality and quantity of prey, prey accessibility and sea bird foraging efficiency (Johnston *et al.,* 2021). During these studies, it was revealed that across most species, prey abundance had a significant influence on sea bird demographics (Johnston *et al.,* 2021), particularly in areas where there was a reduction in prey species due to the adverse effects of extreme weather events, impacting seizing bird species such as kittiwakes (Johnston *et al.,* 2021). These studies have emphasised the impacts that current climatic changes are having on important sea bird populations and a focus may need to shift to the conservation of fish stock management and the protection of bird colonies from intense weather/storm events (Johnston *et al.,* 2021).

To mitigate the increasing effects of climate change on the coastal ecosystems located within the management plan region, a proactive approach must be taken in addressing all negative vulnerabilities associated with extreme weather events that will change over time. Incorporating nature-based solutions into strategic management plans will help to reduce risks associated with climate change through the creation of new intertidal habitats (e.g., saltmarshes) which act as a natural barrier during high-risk periods. By using these nature-based approaches for shoreline protection, it mitigates risk of damage to coastal and shoreline areas while increasing habitat restorations and value. Green and blue mechanisms for coastal protection management are being recognised as a coastal management "*Panacea*" for coastal change, however in some exceptional scenarios, grey infrastructure may apply. In these cases, applying both an engineering and nature-based response could be a successful management solution. The management plan and overall inshore marine areas across the island of Ireland present a series of difficult and complex threats for the long-term resilience and sustainability for protected marine features. The threats expected to have impacts in these areas will include increased rates of erosion, especially in areas of sand dunes, creating non-compatible conditions for sensitive indigenous species and allowing the expansion of non-indigenous warm water species. To aid adaption and mitigation against climate change, coastal landowners and statutory regulators are encouraged to follow the actions outlined in 4.2.

Blue Carbon Habitats.

Marine carbon storage habitats or 'Blue Carbon' are habitats mainly composed of salt tolerant habitats that can store large quantities of carbon within the soils and the sediments in which they grow, sequestering carbon through natural processes. These

Blue Carbon habitats are very efficient ‘carbon sinks’ and able to store significantly more carbon than terrestrial equivalent habitats of similar size (forests, heathlands, grasslands etc), making them a significant asset for the mitigation of climate change. Blue Carbon habitats within the management plan area include areas of seagrass meadows, kelp forests, saltmarsh, maerl and shellfish beds and are all important in sequestering high levels of carbon emissions.

Red Bay SAC located just off the village of Cushendun in Co. Antrim, is a prime example of a blue carbon area that contains Annex I Sandbanks comprised of both living maerl and sub-fossil maerl (DAERA, 2017d). These maerl specimens have been thoroughly mapped and characterised as part of this SAC selection assessment (DAERA, 2017d). Unique to this site, there are large mega-ripples of sub-fossil maerl (approx. 2-3m) high, much of which is dominated by living maerl (*Phymatolithon calcarium*) (DAERA, 2017d).

DAERA are developing a Blue Carbon Action Plan in conjunction with key stakeholders, which will help to steer how blue carbon habitats are protected, managed, and restored in NI. Additionally, the EU Habitats Directive provides protection to important salt tolerant plant habitats that in turn support other rare species of plants and animals within the area. It is therefore essential that there is sufficient protection for these habitats to enable renewed growth within the management plan area. This will ensure that these habitats will be conserved, restored if declining and established in new areas deemed appropriate within the management plan and adjacent areas, using the Strategic Guidance actions in section 4.2.

Strategic Guidance 9: Research and Education.

Marine research has been carried out throughout the management plan area and past research has been conducted by the competent authorities, marine NGOs, and academic partners (i.e., AFBI, Bird Watch Ireland, Marine Institute, and universities). Within the management plan area, continued and future marine research will be encouraged as an output to further enhance awareness and knowledge sharing of connectivity between MPAs and adjacent areas.

All marine research within the management plan area should adhere to governmental guidelines, practices and advice through guidance and actions outlined in 4.2. These actions focus on the mitigation of any negative impacts or alterations to protected features within MPAs, designated habitats and species. Operators and members of the public (conducting citizen science) should adhere to the guidance set out in actions in 4.2.

Strategic Guidance 10: Ballast Water and Accidental Offshore Discharges.

The use of ballast water is essential for the safe and efficient operation of vessels by ensuring their stability whilst operating. Although ballast is important it can also be traced as a spreader for marine non-indigenous species, examples of these include brown algae, some species of barnacles and sea squirts. To regulate the discharge of ballast water and control the spread of invasive species the International Maritime Organisation (IMO) through its Marine Environment Protection Committee (MEPC), developed the International Convention for the Control and Management of Ships' Ballast Water and Sediments, which was adopted at a Diplomatic Conference during 2004. The Convention applies to all vessels that operate in the waters of the North Coast - North Cannel Region. It applies to all vessels, regardless of size/tonnage, that are entitled to fly the Flag of a Party to the Convention.

Within the UK, new legislation through The Merchant Shipping (Control and Management of Ships' Ballast Water and Sediments) Regulations 2022, places controls on the discharge of ships' ballast into UK waters. The approach is based on the International Ballast Water Convention. The legislation aims to protect the UK coastline by stopping international shipping or UK ships returning from international locations emptying unmanaged ballast. This will help to prevent the spread of non-indigenous species and limit the impact of spread of already present non-indigenous species within the marine environment.

In the RoI, the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) has been ratified with regulations coming into force in 2023. This will help control the spread of non-indigenous species and pathogens. Vessel operators and owners should coordinate and integrate water/waste and fuel management in a manner that seeks to prevent pollution, accidental discharge and promotes sustainable and effective on-board storage. Within estuaries and near-shore areas there should be awareness for enhancing and improving water quality by preventing accidental pollutant discharge and eutrophication. Vessel operators should adhere to the considerations set out in actions in 4.2.

Strategic Guidance 11: Land-Use Sediment Run-off.

Land-based activities in shoreline areas adjacent to the coast within the North Coast - North Channel region can greatly impact the rate of sediment runoff into the marine environment. Land based activities such as agriculture, drainage and development in

coastal areas should be conducted in such a manner where the sediment run-off has minimal impact. If a land-based activity has the potential of increasing the rate of sediment run-off into the North Coast - North Channel region, the guidance in 4.2 should be considered.

The most significant pressures on water quality are from the release of the nutrients; phosphorus and nitrogen from agricultural sources (DAERA, 2019b). Agriculture can also give rise to sediment entering waters due to damage caused to riverbanks and lake shores by livestock trampling and from other types of land disturbance. Other pressures from agriculture include the contamination of waters from hazardous chemicals, such as pesticides and sheep dip (DAERA, 2019b).

Strategic Guidance 12 Wild Seaweed Foraging and Cultivation (Farming).

Foraging and the cultivation of seaweed including kelp is a growing sector within the North-Coast – North Channel Region. Wild seaweed provides opportunity as a unique food source within the hospitality industry, and within the tourism and recreation industry (i.e., seaweed baths). Wild seaweed can be used as food product, cosmetics, ingredients in animal feed and a source of material for biofuels. Wild seaweed and kelp foraging for a personal/recreational perspective should be practiced in such a way which adheres to the amended Wildlife Order 1985 (NI) and the Wildlife Act 1976 (Revised) (RoI). This should focus on minimal and sustainable foraging in areas within MPAs to help encourage MPA integrity through leaving enough (1/3) of the resource for regeneration. Wild seaweed foragers cultivation should consider the impact that their having within the marine/coastal environment and mitigate negative environmental impacts. Foragers should ensure only indigenous species are cultivated. Strategic Guidance actions in 4.2 should be considered when harvesting or foraging for wild seaweed.

Cultivation/faming - In the UK, wild seaweeds, including kelp, have traditionally been used for centuries for food, feed and fertilizers. Demand has so far been met by harvesting of wild resources; however, the increase in demand of seaweed biomass is likely going to be met by farming rather than natural harvest (Capuzzo and McKie, 2016). Aquaculture production of seaweed farming industry in the UK is still limited, although there are research farms associated with Queens University and a commercial farm on Rathlin Island. The most farmed species within the UK are *Saccharina latissima, Laminaria digitata, Alaria esculenta*, and *Palmaria palmata* (Wilding *et al.,* 2021).

Seaweed is farmed suspended in the water column, either on ropes or on textiles, although the structure and shape of the farm can be variable. The most common method followed in Europe is twining seeding, where the seeded twine is unwound from the spool, the wrapped helically around larger longline ropes (Wilding *et al.,* 2021). For commercial scale operations, cultivation lines heavy with seaweed can be lifted out the water workboats with winches, before cutting seaweed from the lines.

Following deployment, cultivation should be monitored and maintained to prevent damage to infrastructure or loss of biomass due to entanglement of lines (Wilding *et al.,* 2021). Environmental conditions and growth rates should be monitored with regular (monthly, or more frequently when approaching harvest) biomass estimates recommended (Wilding *et al.,* 2021). Strategic Guidance actions in 4.2 should be considered for the cultivation/farming of seaweed.

Strategic Guidance 13: Military and Defence.

Throughout the North Coast-North Channel Region there are a diverse range of military activities from the Irish Defence Forces in the RoI and the Ministry of Defence in NI.

The UK Ministry of Defence (MoD) have an established presence within the Magilligan Point of Northern Ireland. The MoD isa competent authority in the same way as other public bodies, Government Departments etc. and follow the assenting requirements for activities within MPAs, including ASSI and HRAs. The military use their own environmental; assessment of military activities, as military activity is not widely covered by JNCC conservation advice. However, there is minor indication that any military activities are having any negative impact on the marine environment.

In the Republic of Ireland, DoD has created a strategic guidance which, under the White Paper on Defence provides strategic comprehensive defence up to the period 2025. This highlights the range of activities undertaken by all military operators and along with appropriate practices to sustain, maintain and enhance the marine environment in which they take place.

4.2. Specific Goals and detailed actions to deliver Strategic Guidance.

Strategic Guidance 1: Commercial Fisheries.

The DAERA (2020) consultation on the development of fisheries management measures for MPAs has identified areas of concern in relation to commercial fishing activities across multiple MPAs within the inshore marine region of NI. These concerns include the impacts from demersal, dredge and static gear within the different MPAs and across the designated features (i.e., sand banks, reefs, and seagrass etc.). The recommendations included putting restrictions on certain fishing activities within or over features within MPAs. Subsequently The Marine Protected Areas (Prohibited Methods of Fishing) Regulations (Northern Ireland) 2022 and The Scallop Enhancement Sites (Prohibited Methods of Fishing) Regulations (Northern Ireland) 2022.

Management measures which cover commercial fisheries within the North Coast – North Channel Region, including that within MPAs or adjacent, are outlined below and include both statutory measures and guidance.

1. Landing sizes for lobsters, brown crabs, velvet crabs and whelks are governed through Regulation (EU) 2019/1241 of the European Parliament and of the Council on the conservation of fishery resources and the protection of marine ecosystems through technical measures. Historically these were introduced at an EC level through Council Regulations (EC) 850/98. This Regulation has been retained in UK Law following its exit from the EU. In Northern Ireland the current Minimum Landing Sizes (MLS) are 150mm for brown crab, 87mm for lobster, velvet crab 65mm and 45mm for whelk. Whilst the MLS for velvet crab, lobster and whelk follow those set out in the EU regulations, DAERA have increased the MLS brown crab from the retained MLS of 130mm to 150mm from 25th January 2022 following consultations with the fishing industry on ways of sustaining the stock.
    a. Unless a species is subject to the landing obligation (discard ban) you must return all catches below the MLS to the sea immediately.
    b. The Edible Crabs (Conservation) (Amendment) Regulations (Northern Ireland) 2021 (S.R. 2021 No. 336) prohibit the retention on board, the bringing to land and the landing from a sea -fishing boat, the detached claws of an edible crab.

2. The Unlicensed Fishing for Crabs and Lobster Regulations (Northern Ireland) 2008 was introduced to improve the management and conservation of crab and lobster and to prevent the increase in fishing by hobby fishermen who did not hold a license.
    a. Under the regulations it prevents anyone without a license from:
        i. Landing more than five crab and one lobster per day,

ii. using more than 5 pots; and
iii. using a stock cage.

b. Currently, there are no restrictions placed on pot fishing for whelks (other than the EU MLS), nephrops and palaemon in Northern Ireland.

3. Using V- notching to increase the total number of reproductive female crustaceans within a population, increasing total egg production of the population. Any female which has been v-notched should not be landed. This reduces harvest rates on reproductive females, and, as the v-notch can last for several moults, females can remain protected for several years.

4. Ban the landing of soft-shelled crab/lobster. Once moulted, brown crab and lobster have a soft shell which not only is representative of poor meat quality due to the high-water content, but which will also greatly reduce their survival rate if landed.

a. The Edible Crabs (Conservation) (Amendment) Regulations (Northern Ireland) 2023 (S.R. 2023 No. 5) prohibit the retention on board a sea-fishing boat, the bringing to land, the landing, having in possession, selling, exposing for sale, buying for sale, or consigning to any person for the purpose of sale a soft-shelled edible crab.
b. Where a soft-shelled edible crab is brought on board a sea-fishing boat, it must be immediately returned to sea, as near as possible to the place from which it was taken.

5. Vessels under 12 metres should be encouraged to use i-VMS while operating within the pot fishery area. Data derived from i-VMS will provide a more complete picture of all fishing in our seas.

a. i-VMS provides latitude and longitude, course, speed and date and time of each positional report and reports data via mobile phone signal (GPRS).
    i. The use of existing technology to provide i-VMS through the mobile phone network will be more cost effective than upgrading and/or buying new technology. The system uses cutting edge antenna technology and will generally give good coverage within inshore areas.
b. This issue has been considered by DAERA (2022), through a consultation on i-VMS for fishing vessels under 12 metres as an enhanced data collection and monitoring tool.

6. Demersal and static fisheries should take efforts to limit bycatch of non-target species.

a. Vessel operators are required to report all incidents of accidental injury/mortality of any marine mammals due to bycatch to DAERA and DAFM within 48 hours of end of trip.
b. In compliance with The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, vessels must also report any

incidents of lost gear to the relevant authorities, if the gear cannot be reclaimed by the vessel. Failing to report or correctly mark lost gear is an offence and may result in prosecution.

c. Static fishing pots should have an escape panel for reduction in by-catch and the easy release of under-size stock. Escape panels have also showed that, when used, less bait is needed.

7. All commercial fishers should actively examine the locations of MPAs before commencing trawl activity, to ensure awareness of all MPAs and designated features within the operating areas. This information can be found on the departmental marine map viewers and associated departmental maps (i.e. DAERA Marine Map Viewer). Using the MarPAMM story maps, Seafish Kingfisher MPA fisheries map (which includes management measures for specific MPAs) and marine map viewers (NI/RoI), awareness can be raised within the fishing community on the connectivity between MPAs, in relation to impacts.

8. Introduction of pot tagging systems to enable quantification of effort, with different colours for commercial and recreational pots. The number of tags issued to each recreational fisherman would reflect the current 5 pot limit, as described in Regulation 4 of The Unlicensed Fishing for Crabs and Lobster Regulations (Northern Ireland) 2008.

9. Marking of Pots for static fishing: Currently there is no definitive way to mark pots to distinguish what fishers a pot belongs to. By ensuring that all pots are labelled in a consistent manner it ensures that they are easily identifiable. This can be used in terms of enforcement, gear conflict, or if a fishermen's pots are moved by weather events.

a. Marking of static pots can help to distinguish the difference between a commercial fisher or a recreational fisher. This could be developed further into a departmental scheme for tagging to examine tagging differences between commercial and recreational fisher.

10. Information on intensity of Dredge/demersal fishing within the inshore regions using smaller vessels is limited and demonstrates a need for enhanced data collection through electronic or observer monitoring of small vessels.

11. DAFM should examine the ecosystem impact of fishing for sprat through monitoring and mapping to assess the negative implications on food sources for seabirds.

12. Smaller shipping vessels undertaking demersal fishing activities for flatfish should limit the impact from demersal gear in areas adjacent to MPAs, as this could create negative impacts to designated features within the management plan area.

13. Commercial fishing should follow best practice on biosecurity to prevent the spread of disease and non-indigenous species.

14. Old fishing gear should be discarded responsibly to reduce the risk of entanglement to larger marine species. Entanglement incidents are to be officially reported in local reporting schemes from environmental bodies.
    a. Commercial Fishing operators should return old gear to harbours and dispose in a sustainable manner that aims to reuse, repair, or recycle for new products.

15. There's an opportunity for the competent authorities to explore with the commercial fishing industry the use of remote electronic monitoring (REM) in relation to enhancing bycatch mitigation for marine mammals e.g., bottlenose dolphins (*T. truncatus).* This focus is not on introduction of REM but exploring better mitigation strategies for bycatch and entanglements.

16. For licensed operators dredging within the wild fishery on Lough Foyle for native oyster (*O. edulis*) the following conditions and regulations must be adhered:
    a. Foyle Area (Licensing of Oyster Fishing) Regulations 2008 as amended (The Foyle Area (Licensing of Oyster Fishing) (Amendment) Regulations 2010),
    b. Foyle Area (Control of Oyster Fishing) Regulations 2008 as amended (The Foyle Area (Control of Oyster Fishing) (Amendment) Regulations 2010, and
    c. Foyle Area (Oyster Logbook and Identification Tagging) Regulations 2008; Foyle Area (Landing Areas for Oysters) Regulations 2008.

Strategic Guidance 2: Aquaculture.

Management measures, which cover aquaculture management within the management plan area, are outlined below and include both statutory measures and guidance.

1. All aquaculture operators within the management plan area should follow statutory guidelines and will require appropriate licencing:
    a. Licensing is required under section 11 of the Fisheries Act (NI) 1966.
    b. Most aquaculture is an exempted activity for EIAs under Marine Licensing rules. The one exception is the need for an EIA for marine finfish.
    c. In RoI, the Aquaculture and Foreshore Management Division of DAFM is responsible for aquaculture licencing under the Fisheries (Amendment) Act, 1997 (Poppleton *et al., 2*021).

2. All aquaculture operators should continually monitor the health of cultivated species within the management plan area to minimise the risk of transmissible

diseases and parasites to naturally occurring species within MPAs. This should also apply to reduce the risk of transmissible pathogens to humans and all aquaculture operators should be aware of appropriate disease notification, reporting, surveillance, and eradication programmes under the Animal Health Law (Regulation (EU) 2016/42.

3. Aquaculture activities have the potential to damage intertidal mudflats and sandflats through trampling (resulting from anthropogenic vehicular presence when accessing intertidal sites) and smothering (caused by aquaculture structures being placed over areas colonised by eelgrass species). This I usually a consideration of the marine licence and/or appropriate assessment process.
    a. Normally construction or deposits below the mean high water spring tide mark require a Marine Licence from DAERA under The Marine and Coastal Access Act 2009. However, elements of shellfish propagation and cultivation are exempt from this requirement under Article 13 of The Marine Licensing (Exempted Activities) Order (Northern Ireland).
    b. However, the exemption does not apply to any such deposit made for the purpose of disposal,
    c. To any such deposit made for the purpose of creating, altering or maintaining an artificial reef; or
    d. To any such deposit that causes or is likely to cause obstruction or danger to navigation.
    e. The licence holder shall ensure that the placement or removal of any structure outside the licensed area holds all other necessary permissions.
    f. To protect the intertidal area, operators can make an application for a Marine Licence, for the use of any temporary ground cover/protection to be placed for a limited period during harvesting/ stocking operations in future. The temporary ground cover must be removed after each operation.

4. Accumulation of pseudo faeces beneath intertidal oyster trestles has the potential to impact benthic community structures.
    a. These impacts are small scale and localised.

5. The Molluscan Shellfish (Control of Deposit) Order (NI) 1972 prohibits the introduction into NI waters of molluscan shellfish taken from outside NI waters except under the authority of a permit granted by DAERA Marine and Fisheries.
    a. All spat and juveniles must be sourced from areas free from known invasive non-native species.
    b. The movement of Pacific oysters (*M. gigas*), which is a non-native species, is regulated under the Alien and Locally Absent Species in Aquaculture Regulations (NI) 2012, which implement Council Regulation

(EC) No 708/2007 on the use of alien and locally absent species in aquaculture.

c. All aquaculture operators must comply with The Alien and Locally Absent Species in Aquaculture Regulations (NI) 2012.
d. Attention should be paid to any invasive species initiatives to become familiar with the procedures to mitigate the risk of species establishments. The Invasive Species Ireland project is a collaboration between the NPWS in the RoI and NI Environmental Agency and began in May 2006. It aims to reduce the impact and threats from invasive species on the island of Ireland and more information about the initiative: https://invasivespeciesireland.com/wp-content/uploads/2010/07/Aquaculture_CoP.pdf.

6. Intertidal Shellfish gathering undertaken as a commercial activity and sold into the food chain must comply with retained EU Regulation 853/2004, which lays down specific hygiene rules for premises that handle or process fishery products.

7. The DAERA intertidal shellfish gathering consultation 2022 recommends:
    a. A closed season for winkle gathering from January to April would be the most effective time to protect future stock.
    b. A minimum landing size should be set at 16mm to allow all specimens a minimum of one winter spawning,
    c. A bag limit of 4kg/ 2litres in one tide for personal, consumption,
    d. Registration of commercial gathers with the Department with activity logs which detail weight and location of harvesting, and
    e. A night-time curfew can have benefits for shellfish stock, as well as protection of sensitive habitats and species.

8. A voluntary code of practice which aid sustainability of intertidal shellfish include:
    a. Harvesters need to be aware of MPA related regulations and environmental legislation for feature protection.,
    b. Sorting and returning small shellfish to the shore,
    c. Replacing rocks or clumps of seaweed that have been moved while gathering to their original location.

9. It is an offence for an operator to introduce an alien species or to undertake in the translocation of a locally absent species, except under, and in accordance with, the conditions of a permit, where this is issued under the Alien and Locally Absent Species in Aquaculture Regulations (NI) 2012. Licensed aquaculture operators of such species are required by the terms of their Fish Culture Licence to ensure effective measures are taken to prevent the spread of these species outside of the aquaculture site.

10. In the RoI, plans have begun working towards coordinating on the International River Basins Districts Management Plan (IRBDs) and a North/South Water Framework Directive Co-Ordination Group was created to address the issue of cross-border invasive alien species establishments (Poppleton *et al.,* 2021).

11. When establishing new aquaculture sites or altering the operations of existing sites within MPAs, feedback from MPA management groups and local communities should be sought and considered before progressing.

Strategic Guidance 3: Benthic Dredging and Disposal.

Management measures which cover dredging management within the North Coast – North Channel MPAs management plan area is outlined below and include both statutory measures and guidance.

1. It is suggested that all dredging locations within the management plan area be identified through regular bathymetric monitoring and appropriate assessment of potential sediment deposit rates (DAERA, 2017e).

2. Marine licenses for dredging within the management plan area must be obtained from the relative authorities:
    a. In NI the Marine and Fisheries Division of DAERA are responsible for licensing and monitoring dredging activities under Marine and Coastal Access Act 2009.
    b. In the RoI, consent must be granted by the Department of Housing, Local Government and Heritage (DHLGH) under the Foreshores Act.

All dredging operations within the management plan area will require two licences: one for removal of sediments and one for the deposit of extracted materials at a designated disposal site.a. To mitigate risk of pollution, all potential polluted contaminants from extracted materials must be identified prior to license application under the OSPAR Guidelines for the Management of Dredged Materials, which can be found here: OSPAR-dmguidelines.PDF (dredging.org)

    a. Sediment analysis is required to determine the levels of pollutants within material to be dredged. A chemical analysis must be conducted by a recognised laboratory to assess the risk of environmental impact. levels of pollutants are detected within material to be dredged, a chemical analysis must be conducted to assess the risk of environmental impact. If the level of contamination is considered too toxic for the marine environment, the materials cannot be disposed of into the sea and further investigations should be carried out to identify the source of contamination and further specialist dredging and disposal techniques carried out (DAERA, 2017e).

4. Dredging operators should be aware of all MPAs, the MPA network, protected species and the connectivity between MPAs when carrying out dredging activities and where practicable should limit the impact to designated features.

    a. All dredging operations should be up to date and familiar with the Marine Wildlife Licencing Guide which can be found: https://www.daera-ni.gov.uk/publications/marine-wildlife-licensing-guidance-applicants.

    b. Dredging operations produce 'low frequency omnidirectional sound' and some coastal dredging operations can be heard from approx. 10km offshore (NPWS, 2014). Dredging operators should be aware of the potential risk this noise pollution may have on marine mammals within the management plan area that are sensitive to loud underwater sounds such as cetaceans and grey seals. These animals rely on acoustics as a form of navigation/communication and disturbances caused by damaging noise levels can cause confusion and behavioural changes. As important marine predators this could have a ripple effect throughout the entire coastal and offshore ecosystem. A Marine Mammal Observer (MMO) should be present to monitor the surrounding area for cetaceans or seals whilst dredging activities are under operation. This will considerably reduce the risk of injury/disturbance to the larger marine mammals.

Strategic Guidance 4: Recreation and Tourism.

Shoreline based recreation.

Management measures which cover recreational activities and shore-based management within the management plan area are outlined below and include both statutory measures and guidance.

1. Recreational users within MPAs where activities including angling, sea bathing, bird watching, walking/hiking, geo-tourism, exercising, and beach going should ensure that interactions with designated species or habitats do not create or cause negative adverse effects.

2. Recreational users should comply with appropriate regulations around wildlife disturbance.
    a. Section 23 (7)(c) of the Wildlife Act 1976 (Revised) (RoI) and the Wildlife (NI) Order 1985 states that it is an offence to wilfully interfere with or destroy a breeding or resting place for wildlife.
    b. The Conservation (Natural Habitats etc.) Regulations (NI) 1995 (as amended) gives power to the competent authority to reduce the level of disturbance to habitats and wildlife with protected features.

3**.** Certain species are protected by international, European, and national legislation throughout the UK and Ireland. Offences can include intentional or reckless disturbance, taking, harming, and killing and in some cases possession or sale of the species.

a. For common or grey seals, all users should keep their distance 100m and refrain from touching or interacting with live or dead animals.
    I. Never separate seal pups from mothers. Leave lone pups alone – the mother may only be foraging for food.
    II. If there are several people on foot, keep to one side of the animals and leave them an escape route to the sea. Remain as quiet as possible, especially if you are in a group, and avoid sudden movements.
    III. Never camp near a haul-out site or at a breeding site.
    IV. If you come across an abandoned seal pup which is obviously injured, sick or distressed, contact Exploris on 07701 372 623 (NI). Do not pick the seal up or chase it back into the sea. Instead, observe from a safe distance until the rescue team arrives.
    V. In NI, if you come across a dead seal, contact the DAERA Marine and Fisheries Division Marine Conservation and Reporting Team (MCRT) on Marine.Wildlife@daera-ni.gov.uk or 028 905 69421. Exploris do not have any involvement with dead seals.
    VI. If you find a whale, dolphin or porpoise stranded (live or dead) on the beach contact the DAERA Marine and Fisheries Division Marine Conservation and Reporting Team (MCRT) on Marine.Wildlife@daera-ni.gov.uk or 028 905 69421
    VII. In the RoI all sick or injured seals sightings can be reported to Seal Rescue Ireland on 087 195 5393 or your local National Parks and Wildlife Service.
    VIII. Report the stranding to the Irish Whale and Dolphin Group via the app (IWDG Reporting App), email strandings@iwdg.ie or phone 0892790295 or your local National Parks and Wildlife Service station.
b. For seabirds: Where possible use binoculars or a telescope, understand the birds' situation and behaviour and recognise signs of stress.
    I. If you are disrupting their behaviour in any way, back off carefully.
    II. Use bird hides or observe from a vehicle or boat at a distance.
    III. Approach birds slowly and quietly and, if on foot, adopt a prone position whilst observing.

IV. Be careful that the size of your group does not in itself disturb the birds, particularly if they are not used to people watching them.
V. Always keep noise and sudden movements to a minimum.
VI. Be very careful not to leave any litter, and do not leave food 'for the birds'. It is likely to attract predatory gulls and do more harm than good.
VII. Avoid flash photography, especially at close range. Flash is rarely needed but is a default setting on many cameras. Check your settings before your trip.
VIII. Drones should never be flown directly at or through nesting, foraging or rafting birds. Care should be taken not to disturb birds by flying too close to them. For more information see DAERA leaflet on drone usage: https://www.wildlifecrimeni.org/_files/ugd/259455_db4ed41291ce447bb7781013ab3d16aa.pdf.

c. Recreational dog walking:
I. Dogs can often cause alarm to seabirds, waterbirds, and seals, if you do take your dog with you keep it on a lead and under close control.
II. To avoid disturbance of seabirds and marine mammals such as seals, walk your dog towards the back of the shore and try to avoid seal haul - outs and/or the feeding birds along the tide line, or at times of low and high tide.
III. Keep away from known bird roosts and take note of any signs requesting your co-operation in these areas.
IV. Do not allow your dog to chase birds on the beach as this stops them from feeding and roosting.
V. Keep your dog on a lead when near feeding or roosting birds and in areas used by other recreational activities, as boisterous dogs can scare both birds and people.
VI. Please clean up after your dog to keep the beach safe and clean for other users.

4. Support management of licensed operators through the development of information and training needs for recreational service operators to enhance visitor experiences.

5. Support and promote the implementation of volunteer codes conduct for activities within MPA sites:
a. Leave No Trace Campaign for the Island of Ireland.
b. The WiSe Scheme - Minimising Disturbance for Marine Wildlife
i. Contains guidance for cetaceans, seals, basking sharks and seabirds, within their Boat course and new Adventure courses.

c. Newry Mourne and Down District Council's Guidance on Share the Shore shoreline information panels; and
d. Nature Scotland's A Guide to Best Practice for Watching Marine Wildlife.

6. Shoreline anglers are required to follow UK and EU fishing byelaws, regarding any take size and/or quantity limits, and prohibited species (salmon, sea trout and sea bass during spawning).

7. Recreational activity should adhere to best practice so that they do not contribute to environmental damage or disturbance.

8. The increase in marine litter is a growing concern for all coastal species including marine mammals. It is estimated that 70% of all marine litter has reached the seabed, while 15% can be found floating on the ocean's surface and a further 15% reach inland shores (OSPAR, 2022).
    i. Education of the significant impacts of marine litter on local marine species is crucial to the successful conservation of marine species located in the management plan area.
    ii. Recreational users should use coastlines in a respectful manner and follow the guidance set out by Clean Coasts 'Enjoy and Protect Document' code of conduct.

Surface based recreation.

Management measures which cover surface activity management within the management plan area are outlined below and include both statutory measures and guidance.

1. Surface based recreational users should comply with appropriate regulations around wildlife disturbance.
    a. Section 23 (7)(c) of the Wildlife Act 1976 (Revised) (RoI) states that it is an offence to wilfully interfere with or destroy a breeding or resting place for wildlife.
    b. The Conservation (Habitats &c.) Regulations (NI) 1995 (as amended) gives power to the competent authority to reduce the level of disturbance to protected habitats and species.

    c. In the RoI, the Natural Heritage Act and the Wildlife Act 1976 (Revised (RoI) ensures the protection and conservation of all wild flora and fauna with the intention of continually preserving important ecosystems.

2. Certain species are protected by international, European, and national legislation throughout the UK and Ireland. Offences can include intentional or

reckless disturbance, taking, harming, and killing and in some cases possession or sale of the species.

3. Boat angling is required to follow UK and EU fishing byelaws, regarding taking size and quantity limits, and prohibited species (salmon, sea trout and sea bass during spawning).

4. Surface based recreational users within MPAs where activities including boating, jet skiing, bird and marine mammal watching, pleasure cruisers and recreational offshore fishing should demonstrate that there will be no significant adverse effects, directly, indirectly, or cumulatively on designated feature areas.

5. The DAERA consultation 2022 on management measures for use of fast and personal watercraft In MPAs has recommended management measures for the management of fast watercraft:

    a. For commercial tour operators' access will be permitted to MPAs on the condition the vessel's skipper has gained certification in the WiSe Scheme,
    b. For recreational users' issue of Advisory Notices detailing best practice on the use of PWCs in MPAs where vulnerable marine species are a designated feature.
    c. Permitted access to marine protected areas for PWC use, conditional on the user's agreement to abide by a code of practice for the operation of PWC in specifics MPAs.
    d. Speed restricted zones within specific areas of MPAs
    e. Prohibition zones within an SPA where there is the risk of disturbance to loafing / nesting birds.
    f. Prohibition zones within an MPA where the use of PWCs are excluded in the vicinity of marine species sensitive to disturbance of entry to specific zones.
        I. The boundaries of any prohibition zone will be set considering the guidance set out in the WiSe Scheme (DAERA, 2022b).

6. All operators of leisure boats and cruises advised to ensure effective measures are taken to prevent the spread of non-indigenous species within the MPA network.

7. Pleasure boating and cruising operators should aim to achieve best practice as outlined within Moorage and Anchorages strategic guidance through the RYA Green Blue guide, to reduce the risk of degradation to designated benthic features within or adjacent to MPAs and protected wrecks.

8. Surface based recreational users from pleasure crafts should take caution when anchoring and mooring within MPAs and adjacent areas to ensure as little

damage to the seabed and the designated features within the area (i.e. seagrass). Operators should follow the appropriate code of conduct as set out in the 'Green Guide to Anchoring and Moorings' developed by the Green Blue Organisation and RYA.

    a. An opportunity should be explored between competent authorities and recreational boating groups for the development of a coastal atlas which can aid tracking of crafts. This has been conducted by the RYA in England using Automatic Identification System (AIS) which can support pressure management.

9. In the case of interactions with marine mammals and Basking Sharks, surface based recreational users should, first slow down and take time to assess what the animal(s) are doing and, if possible, what the group composition is. If they are feeding, the impacts of you approaching could be more serious as you could disrupt this important behaviour. If they are with young, this may affect their willingness to engage. Knowing what their original behaviour is can help you determine if you cause a disturbance, i.e., if the behaviour significantly changes.
    a. Do not approach animals closer than 100m. Remain at least 200m away if another boat is present and 300m away if a mother and calf are present.
    b. Spend no longer than 15 minutes near the animals.
    c. Do not drive head on, in-between or attempt to encircle the animals.
    d. Maintain a slow 'no wake' speed and steady course.
    e. If animals approach your craft, turn the engine to neutral.
    f. Never swim with animals in the water.
    g. All recreational boat users should adhere to the correct guidelines through the Sharks Trust, Basking sharks code of conduct which applies to both UK and EU waters.

10. Sea bird feeding, diving and general interactions from surface based recreational users can occur among large groups, or rafts, on the sea both in summer and in winter. If you see a raft of birds ahead, reduce speed to less than 6 knots as you approach. A minimum approach distance of 50m is recommended, although this may be varied according to species and circumstance. Avoid driving your boat through rafts of birds and navigate around them where practicable and safe to do so. Breaking up rafts can make them more vulnerable to predators and uses up precious energy.

Sub Aqua based recreation.

Management measures which cover shoreline management within the Management Plan area are outlined below and include both statutory measures and guidance.

1. Recreational divers must hold all appropriate diving qualifications issued by accredited diving organisations in order to dive e.g. Professional Association of Diving Instructors (PADI).

2. Recreational divers must adhere to safe and responsible diving practices as outlined by the British Sub Aqua Club (BSAC) and BSAC Safe Diving Guide.

3. Divers and snorkellers are encouraged to follow UNESCO's Code of Ethics for Diving on Underwater Cultural Heritage Sites and the BSAC, PADI and the Sub-Aqua Association's (SSA) Respect Our Wrecks Code of Practice.

    a. Respect our wrecks policy:
        i. Respect war graves. Many wrecks are also war graves. Treat them with the respect you would give a churchyard.
        ii. Respect the wreck environment. Many wrecks make great habitats for marine life. Treat them with the care you would give to coral reefs.
        iii. Respect the future. Explore wrecks, where allowed, but don't damage or disturb them. Take photos rather than souvenirs, so that our wrecks remain for future divers to see.
        iv. Respect our history. Many wrecks have an important history and hold clues to our maritime past. If you find anything, report it to the Receiver of Wreck (Receiver of Wreck - GOV.UK (www.gov.uk)), who will pass on such information to archaeological experts.
        v. Respect yourself. Make sure that you are appropriately trained for safe wreck diving.
        vi. Respect your family and friends. Some wrecks contain dangerous cargoes or live munitions. Don't disturb them or bring them ashore.
        vii. Respect the law. Know and respect maritime laws - and avoid a criminal record.
    b. Diving in and around areas that have been classified as military sites, especially aircraft remains, should be aware of Protection of Military Remains Act 1986 (NI), which provides protection from interference as it could be a war grave.
    c. Under the Protection Wrecks Act (1973), it is illegal to dive the site of the La Girona without a license from the Department for Culture, Media and Sport (London).
    d. HMS Drake, SS Loughgarry and Devereux are scheduled monuments under the historic monuments and archaeological objects NI Order 1995, divers removing objects from, or otherwise damaging these wrecks may be prosecuted.

4. Recreational divers can aid marine biodiversity conservation efforts, information recorded by divers and other recreational users can provide assessment data for on-going condition of our marine ecosystems could help experts to identify trends and changes in the MPA network.

a. Divers can actively help to protect the marine environment by reporting marine life sightings to CEDaR online recording facility or by using iRecord or iNaturalist smartphone app and watching out for marine wildlife disturbance**.**

5. Recreational divers participating within sub aqua activities should aim to achieve best practice when diving in areas containing marine mammals, seabirds and basking sharks.

    a. Recreational divers are encouraged to follow the guidance laid out within the British Sub-Aqua Club's Divers Code of Conduct (Annex VIII) when participating in Sub aqua activities.
    b. Divers and snorkellers must follow The Access to the Countryside (Northern Ireland) Order 1983 and seek permission from the landowners prior to entering private land.
    c. Divers and snorkellers should follow the principles of 'Leave No Trace' while on land before or after their dive/snorkel.

6. Recreational divers intending to dive protected shipwreck sites are required to obtain the relevant licences from the competent authority.

7. Recreational divers engaging in sub-aqua fishing activities are required to follow UK and EU fishing byelaws regarding take size, catch quantity and prohibited species (salmon, sea trout and sea bass during spawning seasons).

8. Divers and Snorkellers operating within the area should follow the Codes of Conduct set out within the Causeway Coast and Glens Heritage Trust and Ulster Wildlife's Rock pool, Snorkel and Shore Diving Guide- For sub-sea and shoreline. This approach is applicable for coastal areas outside of the Causeway Coast.

Strategic Guidance 5: Renewable Energy.

Management measures, which cover renewable energy management within the management plan area, are outlined below and include both statutory measures and guidance.

1. Renewable energy developments must adhere to the maritime spatial plan and should follow the conditions of the Habitats Regulations Assessments, Appropriate Assessments and Environmental Impact Assessments. These are statutory departmental requirements that must be taken into consideration when developing renewable energy projects within the North Coast-North Channel Region.
    a. Developers will need to incorporate the mitigation hierarchy as part of the HRA, EIA and Appropriate Assessment, with the need for developments to attempt to first avoid, then mitigate, then compensate adverse effects to MPAs and designated species in adjacent areas.
    b. DAERA Marine and Fisheries Division carries out licensing functions in Northern Ireland territorial waters, under the Marine and Coastal Access

Act 2009. Proposals related to renewable energy developments may require a marine licence and developers are advised to engage with the Department at an early stage, to determine what authorisations may be required.

c. Developers must undertake all offshore renewable activities in lines with the marine licence under the Foreshore Licence through the Foreshore Act 1933 (RoI).
d. The Crown Estate in NI will be included within the assessments and consultation process and will provide application outputs and considerations relating to activity on the seabed and subsurface owner and leasing authority.

2. Prior to windfarm construction, monitoring campaigns/surveys for biological baseline data must be conducted with continued monitoring of the area during and after operational activities. The duration of preconstruction surveys will depend on the natural variability of benthic community and mobile species surveys (e.g. seabirds aerial survey) (SEER, 2022).
    a. Developers are required to provide all planned mitigations measures that have been designed based on collected data to eliminate harmful impacts to benthic resources (SEER, 2022).
    b. Seabed disturbances should be monitored using high resolution acoustic surveys (multibeam/side scan sonar) to identify minor changes in depth and surface characteristics on the sea floor during operational activities (SEER, 2022).
    c. Water quality must be continually monitored during construction by use of operational sensors (SEER, 2022).
    d. For soft substrates, samples can be obtained from bottom grab samples/cores to assess benthic fauna structure (SEER, 2022).
    e. Use of video and photographic surveys to characterize the habitat and identify all organisms present. Spatial image surveys should be used to monitor changes of a larger scale, providing a holistic view of the study area (SEER, 2022).

3. Renewable energy developments should have adaptive management built into construction, operational and end-of-life stages of projects, to ensure marine environmental safeguards and mitigation measures can be applied to any identified negative degradation identified through monitoring.

4. Protected features present within the management plan area should be recognised by developers to reduce the risk of degrading or disturbances by the establishment or operations of offshore renewables.
    a.Operators should be aware of all MPAs, the MPA network and the connectivity between MPAs when carrying out benthic dredging and where practicable should limit the impact to designated features.

5. All major planning and scoping exercises for offshore renewable development projects within the management plan area, should include an engagement process from MarPAMM regional stakeholders and local communities before further progression.

6. Offshore renewable energy developments should be aware of existing activities and not obstruct their future capabilities.

7. MPAs and areas adjacent to protected features should include buffer zones to offshore renewable developments to protect and enhance ecologically sensitive areas.

8. Operators laying submarine cables within MPAs during renewable energy developments should avoid laying cables in areas containing designated benthic features.

9. Operators carrying out repairs and maintenance of submarine cables should carry out operations in a manner that results in minimal disturbance to benthic areas e.g. horse mussel (*Modiolus modiolus).*

10. Development of offshore renewables and the laying of submarine cables should be avoided in areas which hold significant cultural, historic, or archaeological importance.

11. It is recommended that projects should follow the guidelines laid out within the JNAPC Code of Practice for Seabed Development when developing fixed renewable installations and when laying submarine cables.

12. In the RoI, renewable energy developments that require the laying of submarine cables should have the relevant Dumping at Sea Permits (DHLGH).

Strategic Guidance 6: Offshore Oil and Natural Gas Exploration.

Management measures, which cover offshore oil and natural gas exploration management within the management plan area, are outlined below and include both statutory measures and guidance.

1. This is not a devolved issue within NI and as such the responsibility for acceptance will be set out by the UK Department for Business, Energy and Industrial Strategy. The Oil and Gas Authority, a Government Company, will provide operators with relevant licensing for oil and gas exploration, development, and production within the offshore region (excluding internal waters).

2. DAERA in NI and DAFM in the RoI are the responsible authorities for the issuing of marine licences and any new applications will require departmental consent.

Currently there are no exploratory licences in place and no operational facilities, thus there is no risk.

3. Within the management plan area, there is a commitment from the RoI to end the issuing of new licences for exploration of oil and gas. As a result, the DECC is no longer accepting new applications for exploration.
4. Prior to any new offshore oil and natural gas exploration operations, critical engagement from local communities and regional stakeholders must be considered.
5. The Crown Estate will have an input in all energy related applications as the seabed and subsurface owner and leasing authority.
6. All operators within the oil and gas industry should have a dedicated plan for dealing with potential contaminates and pollutants that may be released into the management plan area because of oil and gas exploration. This approach should be developed to contain potential spillages and contaminants and provide a framework for potential clean-up operations.
7. Operators must recognise and mitigate against the degradation of all designated features and species present within the management plan area.
8. The developments will not be likely within the management plan area and are therefore not of major concern for this management plan.

Strategic Guidance 7: Marine Infrastructure, Ports and Harbours.

Management measures which cover marine infrastructure, ports, and harbours management within the management plan area are outlined below and include both statutory measures and guidance.

1. Developments within ports and harbours the in the management plan area should be done so under appropriate legislative guidelines, with preapproved planning permission and an obtained marine construction licence from the competent authorities (DAERA, 2017e).
    a. DAERA are the marine licensing authority in NI and in the RoI, DAFM is responsible for marine infrastructure licencing.
2. A Port Waste Management Plan (PWMP) should be in place to ensure all waste generated by shipping vessels and other cargo operations is responsibly managed and disposed of.
    a. Ports and harbours are obliged to ensure the provision of waste reception facilities and to ensure a preapproved waste management plan is in place for any shipping operations taking place within the port/harbour (DAERA, 2017e).

b. This plan should incorporate all processes required by the relevant legislations, with focused intentions to mitigate damages to environmental habitats/features (DAERA 2017e). This plan should include details of:

    1. Waste type
    2. Quantities
    3. Storage facilities
    4. Waste treatments required (if any)
    5. Charging systems
    6. Waste disposal details.

c. All shipping operations must obtain approval from the designated port/harbour 24 hours prior to operations commencement.
d. All ship-generated waste must be delivered to a pre-designated waste reception facility and pay a mandatory charge for the service (DAERA, 2017e).
e. All persons operating within harbours/ports/waste management facilities should be familiar with the Marine Guidance Notices (MGNs), Merchant Shipping Notices and Marine Information Notices published by the Maritime and Coastguard Agency (DAERA, 2017e).
f. Harbour authorities along the management plan area should conduct daily patrols to retrieve floating waste/debris/marine litter generated from land and marine based activities or storms.
g. Spreading awareness through citizen science gatherings, school talks and education will encourage the public to change their behaviour with regards to the disposal of personal litter when in a marine environment.
h. Any ‘End-of-life’ shipping vessels must be responsively dismantled/recycled to prevent any potential contaminated material escaping and potentially harming marine and human life. The competent authorities should continually review current energy and waste related infrastructure along the management plan area and the environmental profile of all port users (DAERA, 2017e).

3. Shipping operations, shipping traffic, recreational water sports other terrestrial and marine activities that take place along the management plan region have the potential to cause water pollution.

    i. Harbours and ports within the management plan region is obliged to have specific pre-planned contingency arrangements for potential water pollution events that may occur in the region. The MCA has published a Contingency Planning for Marine Pollution Preparedness and Response Guidelines for local ports and harbours to refer to and can be found:

https://www.gov.uk/government/publications/contingency-planning-for-marine-pollution-preparedness-and-response-guidelines-for-ports.

ii. In the RoI, protection against dredging activities will fall under several international policies including the Sea Pollution (Amendment) Act, 1999, Dumping at Sea Act, 1996, and the Sea Pollution Act, 2006 (Gov.ie, 2019).

4. All fast-moving vessel operators within the management plan area must adhere to any designated speed limits within shipping lanes. This mitigates the risk of reckless disturbances, injury, or mortality of marine wildlife, in particular larger marine mammals such as grey seals and cetacean species.

5. A wildlife licence must be obtained from the relevant authorities intending to partake in marine activities that are prohibited under conservation legislations within the management plan area.

6. Acoustic monitoring should be conducted within management plan area to enhance marine management by monitoring the acoustic presence of a target species, and indirectly by monitoring the acoustic environment individuals are exposed to.
    a. This should be undertaken through Passive Acoustic Monitoring (PAM), which can collect information on the wider soundscape, including noise emitting anthropogenic activities. As benthic feeders, seals are repeatedly exposed to underwater noise pollution.

Strategic Guidance 8: Climate Change, Coastal Processes and Shoreline Change.

Management measures which cover climatic, and shoreline change within the management plan area are outlined below and include both statutory measures and guidance.

To increase resilience along the management plan area's coastal habitats, restoration of features should be encouraged by local landowners, local authorities, and competent regional authorities to help reduce the impacts of increased storm, flooding, and erosion events.

1. The above approach should focus on the use of green infrastructure over grey infrastructure, which can help to dissipate the direct energy, and impacts associated with storms, flooding, and wave energy.
    a. Using green and blue infrastructure (i.e., marshes to increase resilience to sea level rise will create living shorelines that can help to stabilise and protect against higher water levels).
    b. In extreme cases where the competent authority deems it appropriate, hard engineering response will be accepted as a last resort.

c. Managed realignment should be encouraged and promoted by competent authorities.

a. Coastal landowners and responsible authorities should apply nature-based solutions as a provision for greater mechanisms to aid adaptation and mitigation.
    a. Nature-based solutions provide beneficial infrastructure options as they often have a smaller carbon footprint than grey infrastructure and often sequester carbon.
    b. Nature-based solutions can be cost effective in comparison to grey infrastructure and can provide more societal and economic benefits.
b. In areas of identified coastal risk areas, grey infrastructure such as sea walls, rock armour and gabions, should be discouraged with greater focus on green infrastructure.
c. Existing storm defence infrastructure from either governmental, private or a local authority's perspective should consider introducing nature-based solutions or soft engineering.
d. Coastal infrastructure operators should work with competent authorities to achieve an aligned management approach.

2. The proposed measures within this section may require permission from Departments in NI and RoI, for planning permission, licensing, consent and assent etc. Some of these guidance measures may require additional assessment to determine potential impacts on designated features within the MPAs .

3. All relevant coastal landowners should encourage the rehabilitation of sand dunes to restore their natural processes, through grass planting, fencing and controlled grazing within the dune systems, which can help create a buffer and sustain or establish new habitats. This should help to offset coastal squeeze (loss of natural habitats or deterioration of their quality).
    a. All shoreline users should keep to designated paths provided and avoid walking directly on sand dunes as this can result in trampling of dune habitats and damages to the stability of dune systems.
    b. All shoreline users, particularly those with regular access to the designated features, should take extra regard for areas of highly sensitive sand dunes because of coastal erosion, through awareness of local existing signage and restricted areas.

4. All maritime users should report any/all sightings and occurrences of non-indigenous species to the competent authorities.
    a. Marine users can learn about non-indigenous species and the reporting procedures with the relevant departments using the Island of Ireland Interactive Story Map and Citizen Science.

b. In NI the Centre for Environmental Data and Recording (CEDaR) records all data reported for both native and non-native species and can be found at: CEDaR Online Recording | CEDaR Online Recording (habitas.org.uk)
c. In the RoI, the National Biodiversity Data Centre (NBDC) records all data reported for both native and non-native species and can be found at https://biodiversityireland.ie/.

5. Competent authorities should identify low-lying coastal areas along the management plan area that are particularly vulnerable to coastal flooding due to rising sea levels and establish mitigation measures to reduce the risks of flooding. In NI, this is the responsibility of the Department for Infrastructure (DFI) and in the RoI this is the responsibility of the Office of Public Works (OPW).
    a**.** The competent authorities should promote the restoration and establishment of coastal saltmarshes in areas identified as being vulnerable to rising sea levels.
        i. This should involve engagements with local landowners and communities to raise awareness through identification procedures and to be developed in conjunction with both regional and local authorities.
    b**.** Saltmarsh habitats have the effect of by binding and raising sediments, reducing the risk of coastal flooding due to rising sea levels.
    c**.** Competent authorities should identify areas at risk for breeding or overwintering birds within and adjacent to MPAs and install mitigation measure to reduce declines, examples include the installation of artificial floating islands.

6. Coastal work to combat erosion and maritime works capable of altering the coastline are subject to Environmental Impact Assessment under The Marine Works (EIA) Regulations 2007 as amended. DAERA has published guidance on requirements of EIA in marine licensing: https://www.daera-ni.gov.uk/publications/northern-ireland-guidance-environmental-impact-assessment-under-part-4-marine-and-coastal-access-act.

7. Climate change adaptation should focus on managed realignment using 'Nature-Based Solutions' to aid foraging and nesting success sustainability.
    a. The competent authorities should review current conservation methods through 'Nature-Based Solutions' which could aid nesting success through shoreline stabilisation or creation of new wetland habitats.
        i. This process could use existing treated waste from infrastructure projects or marine projects.
    b. Conservation management should switch focus to protection of prey fish stocks of and the protection of internationally important sea bird colonies from storm events (Johnston *et al.,* 2021).

c. Government Departments across the island of Ireland should examine limited access time periods to fishing grounds with sand eels or herring to aid enhancement of food provision for seabirds.
d. Government Departments should ensure that climate change adaptation and mitigation measures should align with the seabird conservation strategy and the MPA strategy review.

Blue Carbon Habitats.

1. The competent authorities should conserve and establish new areas of Blue Carbon habitats within the management plan area, as supported by The Green Growth Strategy 2022, Blue Carbon Action Plan for NIand the EU Adaptation Strategy 2021 for the RoI
    a. Competent authorities should ensure that there is no net loss of existing Blue Carbon habitats and ensuring where possible a net gain of Blue Carbon habitats is achieved.
    b. Enhancing Blue Carbon habitats can be promoted through partnership and effective co-ordination across governmental departments with inter-departmental arrangements set out to help develop and maintain Green Growth strategies as appropriate.
        i. Blue Carbon enhancement should take reference of the blue Carbon Action Plan and MPA Strategy review work that is currently being undertaken by DAERA and key stakeholders. This is following a co-design process with focus group workshops planned and a consultation due in 2023.
    c. The competent authorities should ensure that stakeholder engagement is sought out and maintained throughout the process of maintaining, restoring, and establishing Blue Carbon habitats.
    d. To support further development and implementation of adaption strategies and plans at all levels of governance, the competent authorities should promote local ownership and the use of nature-based solutions.

2. It is an offence to damage, remove or destroy areas of Atlantic saltmarsh meadows, maerl or eel grass (*Z. marina*) beds intentionally or through negligence, under the EU Habitats Directive.
    a. The use of off-road vehicles, agricultural equipment, quadbikes, or other powered vehicles should be prohibited in areas in which Atlantic saltmarsh meadows and eelgrass (*Z. marina)* beds are growing.
    b. Marine users participating in recreational activities such as dog walking, bird watching, trekking, or engagement in citizen science should avoid trampling areas of Atlantic saltmarsh meadows and eel grass (*Z. marina*) beds, keeping to existing footpaths where they are present.

3. The competent authorities should devise and deploy an effective means of removing invasive cord grass (*Spartina anglica)* from areas of Blue Carbon habitats, whilst conserving areas of native habitats.
    a. The use of herbicide spraying methods to remove invasive cord grass (*S. anglica)* should be carefully considered due to the potential adverse impacts on indigenous plant species, as well as the potential impacts on water and sediment stability.

4. The competent authorities should examine and characterise current and future threats to Blue Carbon habitats (and potential Blue Carbon) due to climate change and human activities.

5. Further research and monitoring of coastal areas along the northern coast of Ireland should be undertaken regularly to identify un-designated potential Blue Carbon habitats, with the aim of proposing new Blue Carbon habitats and ecosystems so that they may receive the appropriate level of protection.

6. The competent authorities should provide recommendations for Blue Carbon restoration and generation to help support NI's and the RoI's national response to climate change within associated climate, nature, biodiversity, marine planning and spatial planning policy frameworks.

Strategic Guidance 9: Research and Education.

Management measures, which cover research and education management within the management plan area, are outlined below and include both statutory measures and guidance.

1. Strict guidelines and practices developed by the Joint Nature Conservation Committee (JNCC) UK for survey work seek to ensure that any impact on features is minimised to the lowest possible levels and that the conservation objectives can be achieved.

2. Marine research activities surveys are generally performed by trained, qualified staff using non-invasive techniques (where possible) such as acoustic and video methodologies.

3. In NI, DAERA and the Crown Estate, must be notified before any activities within the MPAs take place and will require the provision of detailed methodologies for all marine research to assess if any impacts to the SPAs, SACs and MCZs features are likely to occur.
    a. The Marine Licensing (Exempted Activities) (Amendment) Order (Northern Ireland) 2022 Article 17 Scientific instruments etc.

4. In the RoI, conducting marine scientific research within SPAs and SACs is subject to consent from the National Parks and Wildlife Service, through the Activities Requiring Consent (ARC) process.

5. In the RoI, researchers conducting surveys on vessels should follow the code of practice for undertaking marine scientific research by the Marine Institute within MPAs.
    a. For research in SACs researchers must apply for consent to the DHLGH National Parks and Wildlife Service through the Conduct Marine Scientific Research at Irish Coral Reef Special Conservation Areas.

6. The Marine Monitoring Handbook addresses the principles behind, and the procedures for, monitoring the habitats and species within marine SACs in UK waters to assess their condition.
    a. Researchers should use the Handbook as a toolkit to assist those with responsibility for monitoring to select and use appropriate methods.

7. Within the UK and Ireland, a series of Recommended Operating Guidelines were produced by the MESH (Mapping European Seabed Habitats) and MESH Atlantic projects to standardise the use of survey equipment. This enables users to obtain the best quality data for habitat mapping and it is recommended that researchers utilise these guidelines for mapping intertidal, shallow subtidal, and deep subtidal habitats by remote and on-site surveys.

    a.For the standards and protocols for the use and ground-truthing of acoustic techniques and remote sensing imagery.

Strategic Guidance 10: Ballast Water and Accidental Offshore Discharges.

Management measures, which cover ballast water and accidental discharges within the management plan, are outlined below and include both statutory measures and guidance.

1. All vessels must comply with the Ballast Water Management convention by the IMO:
    a. All vessels to exchange ballast water at sea away from coastal areas; and
    b. All vessels should specify the maximum number of viable organisms allowed to be discharged, including identified specified indicator microbes harmful to human health.
    c. Vessel operators should be aware of certain circumstances where this convention does not apply,

        i. If a vessel is on a voyage between specified locations,

ii. If all ballast operations are being conducted within the same location,

iii. If the vessel remains in the same jurisdiction and is not a new vessel or unfit for retrofitting, and

iv. If a vessel is operating within a defined area.

v. For more information please visit: https://www.gov.uk/guidance/control-and-management-of-ballast-water#:~:text=Exemptions%20to%20the,Guidelines%20(Guideline%20G7).

2. All new vessels before being put to sea must demonstrate variation of a Water Management Plan and associated systems compliance.
3. All vessels new and existing should follow the statutory requirements within the International Ballast Water Management Certificate, for surveys and outputs of the water management system.
4. Vessel operators should endeavour to develop strategies that demonstrate incident preparedness for accidental collisions with other vessels, submerged rocks, wrecks, accidental beaching or stranding that may result in the accidental discharges of pollutants.
5. Vessel operators should be aware of all MPAs, the MPA network and the connectivity between MPAs when carrying out benthic dredging and where practicable should limit the impact to designated features.

Strategic Guidance 11: Land-Use Sediment Run-off.

Management measures, which cover land-use sediment runoff within the management plan, are outlined below and include both statutory measures and guidance.

1. In Northern Ireland, operators should adhere to the Water (Northern Ireland) Order 1999, which provides the basis for the disposal of wastewater, effluent or industrial discharges.
2. In the Republic of Ireland, operators should use the National Wastewater Sludge Management Plan (NWSMP) which sets out how waste is managed in a sustainable way.
3. Operators should be conscious of the production and disposal of waste during their activities, with particular regard to wastewater which can contain suspended sediments.

a. Directly dumping wastewater into the North Coast-North Channel region or adjoining bodies of water should be avoided, even if consent has been given to do so.

4. Coastal developers should follow the guidance in Planning in the Coastal Area- A developers' guide to planning considerations and environmental responsibilities.
   https://niopa.qub.ac.uk/bitstream/NIOPA/7352/1/Planning%20in%20the%20Coastal%20Area%20-%20June%202017.pdf.
   a. Developers should take measures to reduce excess runoff of sediments into marine areas by designating areas for temporary surface water drainage measures such as settlement ponds.
   b. Silty wastewater should be treated before being discharged to remove the majority of suspended solids within the wastewater.
   c. It is advised that site operators follow the guidelines laid out within the UK's Control of Water Pollution from Construction Sites - Guidance for consultants and contractors C532.

5. Participants of agricultural practices near coastal areas should be aware of the potential risk of agricultural run-off to marine areas and seek advice to achieve Good Farming Practice regarding the environment from the relevant department in Northern Ireland and Republic of Ireland.

   a. Agricultural practitioners are required to receive consent from the Department of Agriculture, Environment and Rural Affairs through the Groundwater Regulations (Northern Ireland) 1998 before disposal of any effluent produced from agricultural operations.
   b. Agricultural practitioners in the Republic of Ireland should follow the official outputs of the River Basin Management Plans as laid out by the Water Frameworks Directive.

6. Any accidental discharge from operations that have the potential to increase the rate of sediment flow into the marine environment or adjoining waterways should be reported to DAERA and DAFM and/or NI Water and Irish Water.

   a. Causing an incident of accidental discharge or failing to report such an incident may result in a criminal prosecution.
   b. New applications for sewage or dredge disposal will be subject to the marine licensing and Water Order discharge consent processes.
   c. Any changes to the current discharge sites will be managed by Northern Ireland Water (NIW) and Irish Water in consultation with the statutory departments.

Strategic Guidance 12: Seaweed Foraging and Cultivation.

As an extension of the public right to fish and gather items from the sea, members of the public can take fresh seaweed which is floating in the sea. Floating seaweed on the foreshore (occurring either as fresh vegetation or drift) can be harvested as part of this public right when the tide is in. However, seaweed remaining as fresh vegetation or drift when the tide is out cannot be taken, unless for some other legal basis.

Seaweed harvesting is not currently regulated through a specific licensing or permit system. However, it is controlled by the following legislation in terms of its impact on nature:

- The Environment (NI) Order 2002;
- The Conservation (Natural Habitats etc) Regulations (NI) 1995 (commonly referred to as the Habitats Regulations); and
- The Wildlife (NI) Order 1985.

Seaweed harvesting guidance was created by the Environmental Heritage Service in 2007 (Now DAERA Marine and Fisheries Division). The management measures are currently undergoing a review and are to be published in March 2023.

Management measures, which cover seaweed foraging and cultivation within the management plan, are outlined below and include both statutory measures and guidance.

1. In NI, DAERA Marine and Fisheries Division and local council must be consulted before harvesting seaweed and landowner permission must be sought.

2. In RoI, DHLGH and local council must be consulted before harvesting seaweed and landowner permission must be sought.

3. Seaweed remaining as fresh vegetation or drift when the tide is out cannot be taken, unless some other legal basis for taking seaweed is established.

4. Seaweed cast above the mean high-water mark belongs to the owner of the land. There is no public right to take seaweed in these circumstances and another legal basis for claiming a right to take seaweed must be established.

5. Harvest seaweed only by hand, mechanical methods should not be used.

6. A private individual or individuals who have been gathering seaweed from the shore for a considerable time period may be able to assert a legal right to do so (sometimes referred to as a ‘wrack right’).
    a. Wrack rights are not unrestricted.

7. An informal right of this nature may be recognised where the person or persons concerned have been taking seaweed from a particular part of the shore for more than 20 years.

8. While taking small quantities of seaweed for personal use is allowed, taking large quantities which might damage the seaweed ‘crop’ in a particular area or have an adverse effect on the local marine environment is not permissible under nature conservation laws.

9. Do not use vehicles on the foreshore.

10. Avoid disturbing wildlife such as seabirds and seals by keeping an appropriate distance away.

11. Avoid or minimise trampling on non-target organisms and avoid taking ‘bycatch’ such as stalked jellyfish and brittlestars.

12. Collect less than one third of an individual plant to allow for regrowth.

13. Cut fronds (leaves) well above the point of growth (e.g., the meristem for kelps) and always leave the holdfast attached.

14. Harvest sparsely, taking only a small percentage of standing stock.

15. Rotate harvesting areas to allow ample time for recovery. Harvested areas should be left for up to several years, depending on the species, before harvesting again.

16. Harvest seaweeds during the active growth season to allow for quicker recovery.

17. Harvest seaweeds after reproduction has occurred if possible and ensure a substantial proportion of mature plants remain.

18. Take extra care when harvesting invasive non-native seaweeds to ensure that seaweeds or spores are not transferred to other areas.

Cultivation/Farming.

Any deposits or construction to facilitate that cultivation is authorised through the marine licensing process by DAERA under the Marine and Coastal Access Act 2009. Extensive commercial harvesting of seaweed would require permission from the Departments (NI and RoI), to ensure a full assessment of impacts can be undertaken.

The information presented on seaweed cultivation/farming has been created using best practice guide from Natural England (Wilding *et al*, 2021).

1. Best practice recommendation for kelps is to collect fertile material from only a restricted number of wild plants (i.e., 10-30 individuals) which can be bio-banked and also used to initiate gametophyte cultures.
    a. Collections should be carried out in accordance with the Crown Estate harvesting licence and operational marine licence.
    b. Environmental Impact Assessments are required in most nascent industries to minimise ecological damage and ensure long-term sustainability and a Habitat Regulations Assessment will be required where seaweed farms are sited near MPAS.
    c. Reproductive material should be sought from sites relatively near to the aquaculture site.

2. Following best practice guidelines for hatchery processes, which include use of sterile air and seawater, UV filtration systems, and germanium dioxide to remove diatom contamination can minimise the change of spread through seedling production.

    a. Recommendations for best practice are difficult to develop as there is limited knowledge about seaweed diseases in the UK (Campbell *et al*., 2019).

3. Biosecurity planning (and cleaning processes) need to be put in place to prevent movement on non-native species.

4. Seaweed cultivation should be sited away from sources of pollution including areas of wastewater outflow.

5. Management to limit the INNS should take into account biosecurity measures that reduce the movement of fouled objects, including service vessels.
    a. Following recommendations to ‘check, clean and dry’ surfaces would also be beneficial to growers where these reduce colonisation and associated losses of seaweed biomass and reduce operational costs resulting from biofouling.
    b. Siting and management may reduce impacts from INNS by considering levels of exposure and water movement, water temperature, cultivation period, timing of harvest, and through the choice of infrastructure materials, which all influence biofouling rates.
    c. Where species tolerances allow, farming at more exposed locations may limit biofouling.

6. Regular maintenance of all cultivation infrastructure is advised, in order to prevent losses into the marine environment, with mandatory reporting of material losses.

7. Applications for new sea farms should incorporate risk planning to examine the possible impacts from catastrophic loss of infrastructure due to storm events,

impacts on hydrodynamics, and the carrying capacity of the site in terms of cultivation density.

8. Developers should seek engagement with the local community where the activity is taking place.

Strategic Guidance 13: Military and Defence.

Management measures, which cover military and defence within the management plan, are outlined below.

1. The UK MoD Sustainable Development and Environmental Manual (JSP 418) set out their commitments to avoiding environmental damage.
2. The presence of **Red flags and/or Red Lights** within the Magilligan Point Firing range prohibits access to the danger area. The authorities can expect that you will not linger in the area, and they operate on the 'Clear Range' principle.
    a. When the red lights are on and red flags are raised there is live firing across this area at those times with the risk of serious injury or death.
3. Under the EU's Maritime Strategy, the Republic of Ireland as a member state provides protections and enhancement of exploitation of the maritime resource including the destruction of marine habitats through the DoD.
4. In the Republic of Ireland, the Naval Service provides a unique sea-going capability for National maritime defence, and the Air Corps provides an effective maritime surveillance capacity.
5. The White Paper on Defence (2000) recognises that Naval Service vessels carry with them unique characteristics as an expression of state sovereignty and political will at sea and in furthering policy objectives in the maritime domain.
6. The Naval Service and the Air Corps provide a range of services to assist the SFPA in securing an efficient and effective enforcement of fisheries protection legislation and these services are covered under an SLA. Naval Service and Air Corps personnel are empowered by statute as Sea Fishery Protection Officers to carry out inspections at sea and to enforce fisheries legislation and regulation.

5. Monitoring of plan effectiveness.

Monitoring, evaluation, and research are fundamental to the success of MPA Management plans (Figure 12). This management plan needs to demonstrate to regulatory authorities, marine activity users and local communities that the management policies are making a difference to the integrity of the conservation objectives and achieving the aim of the plan. This process needs to be iterative with continual learning from management experience to help keep improving the overall integrity of the plan area through adaptive management.

The management plan policies use monitoring to help evaluate the effectiveness of management approaches. Initially the monitoring should focus on outputs that can be measured, using the modelling and data outputs from the MarPAMM project, as well as key species and habitats within MPAs. This approach to monitoring is essential to distinguish the success in delivering the aims, objectives, and outcomes of the management plan. To balance the need for plan evaluation and management stability the regulatory authority will look annually at key performance of the plan and undertake a detailed plan review every six years to provide a detailed update and review of the strategic guidance.

The six-year plan review aligns with the reporting obligations attached within the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 in NI and Article 12 and 17 reporting obligations within the Birds Directive and Habitats Directive for RoI. The monitoring approach and the six-year plan review will also align with the Common Standards Monitoring approach of feature condition assessment within protected areas. This will help with biodiversity indicators, international obligations and assessing progress on feature sustainability from local to international scales.

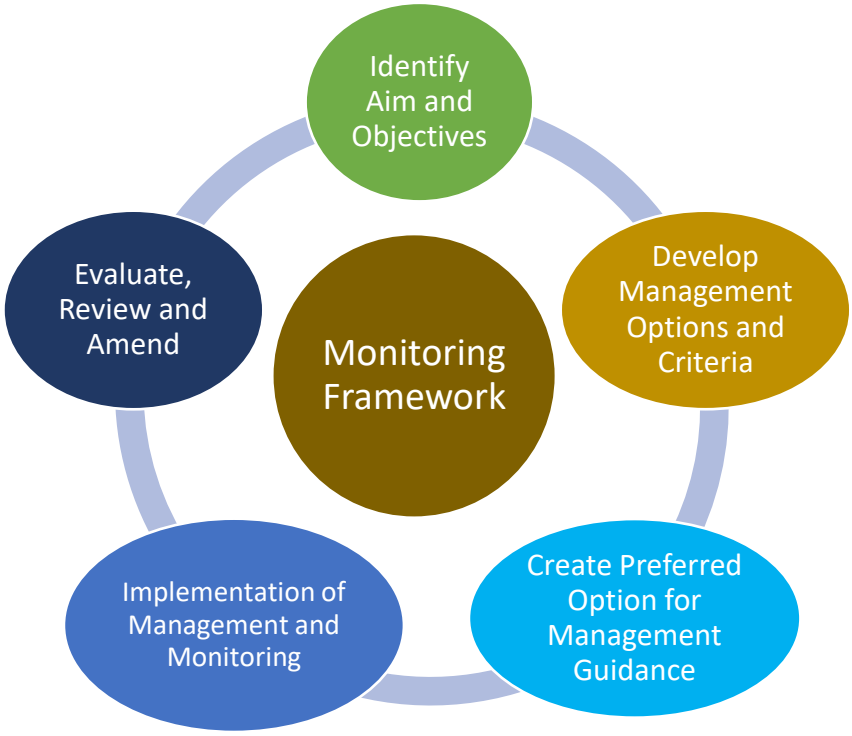

Figure 12: Management monitoring framework (AFBI, 2022).

Strategic Guidance 1: Commercial Fisheries.

1. DAERA Marine and Fisheries Division (NI) and DAFM (RoI) will monitor the impact and application for mitigation of bycatch, such as modifying fishing gear to reduce the accidental catching of non-target species.
    a. This should include extensive monitoring of current impacts and recordings of bycatch on stocks, seabirds, and marine mammals within the management plan area.
    b. AFBI and the Marine Institute will undertake observer trips throughout the year on commercial fishery vessels, which encompasses MPAs to examine target species and by-catch implications. This is island of Ireland wide and not just within the within the management plan area.
    c. The AFBI and Marine Institute observer programme will also alert if non-native species appear in catches.
2. Genetic v-notch monitoring should be undertaken every 2 years to monitor the healthy status of crustacean stocks.
    a) This should include a process to authorise/reject lobster samples to be sent to Queens University for study. This will help to establish how larvae retention is working within management plan area.
3. DAERA Marine and Fisheries Division (NI) and DAFM (RoI) will monitor the scale of biosecurity measures within MPAs.

4. DAERA Marine and Fisheries Division and DAFM will examine the impacts of activities that affect benthic environments and develop records of present condition and subsequent variation of condition in the feature(s) of interest.
5. DAERA Marine and Fisheries Division and DAFM will review and examine the impact of actions associated with this guidance, this should align with climate sectoral plans for commercial fishing and fisheries management plans.

Strategic Guidance 2: Aquaculture.

1. AFBI and the Marine Institute will continue existing monitoring and evaluation procedures examining potential impacts from aquaculture activities within the management plan area.
2. DAERA Marine and Fisheries Division in NI and the Aquaculture and Foreshores Management Division of DAFM in the RoI will continue to monitor the condition of designated features and seabed to assess the impact of aquaculture processes.
3. DAERA Marine and Fisheries Division in NI and the Aquaculture and Foreshores Management Division of DAFM in the RoI will monitor the scale of biosecurity measures concerning the extent of disease, non-native species establishments and native species absence within MPAs that contain aquaculture licences.
4. DAERA Marine and Fisheries Division in NI and the Aquaculture and Foreshores Management Division of DAFM in the RoI will establish monitoring for unlicensed aquaculture activities. Both authorities should examine governance /jurisdictional ambiguity and responsibilities for enforcement.
5. DAERA Marine and Fisheries Division and DAFM will construct an assessment document to review and examine the impact of measures associated with this guidance.
6. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 3: Benthic Dredging and Disposal.

1. The competent authorities (DAERA, DFI (NI), DAFM, DGHLG (RoI)) will monitor the acquisition of permit requirements for all shipping vessels conducting dredging activities in benthic and coastal areas of the management plan area.
2. The competent authorities (DAERA (NI), DECC and DGHLG (RoI)) will monitor the condition of habitats near and adjacent to dredging sites during and after dredging operations.

3. The competent authorities (DAERA (NI), DGHLG and Local authorities) will ensure there is an appropriate waste management plan in place to facilitate the safe and responsible removal of potentially contaminated materials.
4. The competent authorities (DAERA (NI), DECC and DGHLG (RoI)) will monitor and assess the impact of redeposited dredged sediment deposits and test for any chemical pollutants within the material to mitigate risks of contamination to the surrounding environment.
5. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 4: Recreation and Tourism.

Shoreline based recreation.

1. MPA Managers will monitor and assess the levels of recreational activities taking place within the management plan area to enable evaluation of user interaction impacts on features.
2. Competent authorities will monitor recreational shipping vessel's adherence to assigned speed limit within the channel.
3. Local Authorities and/or NGOs with remits for shoreline/beach/pathways should monitor the impacts from visitors in terms of disturbance, litter, camping and anti-social behaviour.
    a. Monitoring should assess the impacts from applications of codes of conduct including 'Enjoy and Protect' and 'Leave No Trace'.
4. The component authorities should monitor the impact of recreational interactions with the conservation objectives of protected features.
5. The competent authorities should develop an assessment document for the purpose of examining the impact of actions associated with this guidance.
6. All aspects of this guidance will be re-examined as part of a six-year plan review.

Surface based recreation.

1. The competent authority will monitor the condition of designated features and benthic seabed to assess the impact of sub-aqua activities and their impact on processes.
2. The competent authority will monitor biosecurity measures and the extent of disease, non-native spread, and native species absence within MPAs.
3. Local authorities and DAERA or DGHLG, will monitor the impact of commercial watercraft sight sighting tours and self-owned recreational jet-skis and fast watercraft.

    1. Monitoring should assess the impacts from applications of codes of conduct including ‘The Wise Scheme’.
4. The competent authority will construct an assessment document to review and examine the impact of actions associated with this guidance.
5. All aspects of this guidance will be re-examined as part of a six-year plan review.

Sub Aqua recreation.

1. DAERA Marine and Fisheries Division, alongside AFBI (NI) and DAFM, alongside the Marine Institute (RoI) will monitor the condition of wrecks, features and seabed to assess the impact of sub-aqua activities and their impact on processes.
2. DAERA Marine and Fisheries Division and DHLGH will construct an assessment document to review and examine the impact of measures associated with this guidance.
3. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 5: Renewable Energy.

1. Any energy activity within and adjacent to MPAs needs to be monitored by the competent authorities to assess impact of activities on designated features from a short term and a long-term period. Currently most renewable energy projects offshore are not old enough to be considered for long-term monitoring.
2. DAERA, alongside AFBI and DGHLG, alongside the Marine Institute, will monitor all renewable energy development operations and ensure the pre-examinations of local biodiversity for baseline data are carried out prior to the commencement of construction.
3. DEARA and DGHLG will ensure minimal impact to marine and benthic species during the laying of submarine cables within the management plan area and throughout operations, will consistently examine any potential impacts these activities have on benthic environments and marine mammal species.
4. DAERA and DAFM will examine the impact and recordings of bycatch on stocks, seabirds, and marine mammals.
5. All competent authorities will ensure that procedures and protocols set out within the JNAPC Code of Practice for Seabed Development is followed by developers during construction of any necessary renewable energy production structures i.e., offshore wind turbine foundations.
6. DAERA and DGHLG will ensure the necessary licences are acquired by developers for waste disposal including Dumping at Sea Permits (DLHGH).
7. DAERA and DGHLG will construct an assessment document to review and examine the impact of the guidance action set out in this guidance document.

8. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 6: Offshore Oil and Natural Gas Exploration.

1. The competent authorities will monitor the impact of offshore oil and gas developments within MPAs.
    i. In NI, the Department of Energy and Climate Change in London (DECCL) are the responsible authority and in the RoI, the Department of the Environment, Climate and Communications (DECC) is the responsible authority for monitoring natural gas exploration.
2. The competent authorities will monitor how offshore oil and gas developments effect designated species behaviours and distributions within MPAs.
3. The competent authorities will construct an assessment document to review and examine the impact of actions associated with this guidance.
4. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 7: Marine Infrastructure, Ports and Harbours.

1. The competent authorities will monitor the condition of features to assess the impact of marine infrastructure developments within MPAs.
2. The competent authorities will monitor how marine infrastructure operations effect designated species behaviours and distributions within MPAs.
3. The competent authorities will monitor the impact of shoreline and beach profile changes as well as erosion rates.
4. The competent authorities for flood prevention measures will monitor the impact of this approach from the perspective of pluvial, fluvial, and coastal flooding.
5. The competent authority will monitor shipping and cargo vessel's adherence to the assigned speed limit of the lough.
6. The competent authorities should monitor larger commercial vessels for adherence to speed limits set within inland loughs, estuaries and MPAs.
7. The competent authorities will construct an assessment document to review and examine the impact of actions associated with this guidance.
8. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 8: Climate Change, Coastal Processes and Shoreline Change.

1. The competent authorities will monitor the condition of designated features to assess the impact of climate change and their impact on processes.
2. The competent authority (DAERA, DFI, DHLGH, and LAs) should monitor the condition of future shoreline within the dynamics of change and the impacts of features.
3. DAERA Marine and Fisheries Division and the National Parks and Wildlife Service will monitor the scale of biosecurity measures and the extent of disease, non-native spread, and native species absence within MPAs.
4. The competent authority will construct an assessment document to review and examine the impact of actions associated with this guidance.
5. All aspects of this guidance will be re-examined as part of a six-year plan review.

Due to the impact of climate change on the marine environment, and the natural processes which take place within, there is no designated feature, MPA or adjoining area within the management plan area that will not be affected by climate change. This extends to all MarPAMM Regions around the island of Ireland, Argyll and Outer Hebrides. As such the actions and measures listed in this strategic guidance can be applied and amended to suit all MarPAMM Regions.

Blue Carbon Habitats.

1. Competent authorities will monitor the scale of biosecurity measures and the extent of disease, non-native spread, and native species absence within designated Blue Carbon Habitats.
2. DAERA should work with NGOs including Ulster Wildlife in monitoring Blue Carbon initiatives in relation to managing successful interventions.
3. DAERA Marine and Fisheries in NI and the National Parks and Wildlife Service in the RoI will construct an assessment document to review and examine the impact of actions associated with this guidance.
    a. Reporting on Blue Carbon habitats should align with reporting within the Blue Carbon Action Plan for NI.
4. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 9: Research and Education.

1. Competent authorities will monitor the scale of biosecurity measures within MPAs.

2. Competent authorities will examine the impact and recordings of bycatch on stocks, seabirds, and marine mammals.
3. Competent authorities will examine the impacts of activities that affect benthic environments and develop records of present condition and subsequent variation of condition in the features of interest.
4. Competent authority should develop an assessment document to review the impact of actions associated with this guidance.
5. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 10: Ballast Water and Accidental Offshore Discharges.

1. DAERA Marine and Fisheries Division and DECC Environmental Protection Unit competent authorities will continue to monitor ballast water discharges.
2. The competent authorities will monitor incidents of permitted and accidental discharges into or adjacent to MPAs and assess the impact of designated features.
3. The competent authorities will construct an assessment document to review and examine the impact of actions associated with this guidance.
4. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 11: Land-Use Sediment Run-off.

1. The competent authorities will continue to monitor discharges of effluent.
2. The competent authorities will monitor incidents of permitted and accidental discharges into or adjacent to MPAs and assess the impact of designated features.
3. The competent authorities will construct an assessment document to review and examine the impact of actions associated with this guidance.
4. All aspects of this guidance will be re-examined as part of a six-year plan review.

Strategic Guidance 12: Wild Seaweed Foraging and Cultivation (Farming).

1. The competent authorities will monitor the impact of seaweed wild harvesting and seaweed cultivation/ farming practices with the surrounding environment.
    a. It is necessary to fill the knowledge gaps which currently impede development and licensing consent of seaweed cultivation and farming in NI.

2. The competent authorities' need to monitor the cumulative effects from multiple seaweed farms, as a small farm is unlikely to result in nutrient depletion, whereas several farms in close proximity may have a detectable local impact.
3. The competent authority will monitor the scale of biosecurity measures and the extent of disease, non-native spread, and native species absence within MPAs that contain aquaculture licences.
4. The competent authority will construct an assessment document to review and examine the impact of management associated with this guidance.
5. All aspects of this guidance will be re-examined as part of a six-year plan review.

The non-statutory policies within this Management Plan will need to be assessed for management effectiveness through a formal engagement process in the future that can examine policy outcomes and to help stakeholders understand the rationale of management approaches applied. The monitoring policies created for each of the thirteen Strategic Guidance areas need to feed into wider regional monitoring for the marine environment in NI and RoI. This ensures accountability for this Management Plan. The monitoring reviews could aid the completion of OSPAR Score Cards as a straight-forward self-assessment tool used by MPA managers to monitor management effectiveness (OSPAR, 2007). 2

An OSPAR Score Card could act as a tool to enable rapid assessment of MPAs across the inshore region of NI and the MarPAMM areas of Co. Donegal and Co. Louth in the RoI. This self-assessment review could use the monitoring outputs of the management plan policies to aid those in Departmental MPAs teams to assess and report on biological and environmental information on the status of species and habitats within MPAs (OSPAR, 2007).

The policies outlined in this management plan have monitoring measures associated with each of them by which progress towards achieving the objectives of this management guidance plan can be assessed. Initially the monitoring should focus on outputs that can be measured with reliance on key species and habitats within MPAs. This approach to monitoring is essential to distinguish the success in delivering the management actions and delivery of the plans aims and objectives. To balance the need for plan evaluation and management stability the regulatory authority will look annually at key performance and undertake a detailed plan review every 6 years to provide a detailed update and review of the strategic guidance.

6. MarPAMM management considerations and Future Work.

This management plan sets out non-statutory guidance and reaffirms existing statutory policy to help enhance and further protection for marine and coastal biodiversity for MPAs within the North Coast – North Channel region. This section looks at future considerations for marine management that may arise or are important for consideration as part of the marine management strategy. By creating this management plan, future uncertainty can be mitigated/adapted by applying the plan's generated principles.

The outputs of the MarPAMM seabirds, marine mammals and benthic habitats and species modelling work packages provide new data and evidence that can be used outside of this plan to improve and enhance integrated and universal marine management. Further MarPAMM work can identify potential gaps that could lead to new research areas or considerations that may become important for any future improvements.

Seabird Modelling work package outputs.

The seabirds work package included collection of new data on sea bird abundance and distribution/movement (via at-sea surveys and tracking studies), collation of existing data and knowledge, and new analysis and models. Listed below are the core components, highlighting key findings and relevance to management.

The key findings from this work are:

- Better understanding of storm petrel colony sizes in NI, including the discovery of new breeding sites. As well as providing this information to inform Seabirds Count (2015-22), these counts provided updated data on sites that have not been surveyed for many years and may help provide baseline data should more regular counts be carried out in future years.
- Baseline data for kittiwake productivity including the creation of standardised plots that can be used at the sites going forward to provide ongoing data on Kittiwake breeding outcomes. Given the recent declines in Kittiwakes, the fact that they have moved from Amber to Red on the Birds of Conservation Concern in Ireland 2020-26 and the fact that Kittiwakes appear to be one of the species susceptible to the current strain of bird flu, having a baseline as well as the ability to monitor productivity going forward is vital.
- Satellite tracking has shown important foraging areas as well as migration routes for a range of species. This work was carried out by BirdWatch Ireland

and AFBI in the MarPAMM project and included tracking work (GPS – foraging, short term and migration) on Lesser and Herring Gulls (GPS/GSM), Kittiwake (GLS & GPS), Fulmar (GLS & GPS), Manx Shearwater (GLS & GPS). This is important work in both an international and Irish context as much of the technology is relatively novel with recent developments improving longevity of tracking devices and potential to cover longer distances.

- Aerial surveys in Donegal Bay, Carlingford Lough and Belfast Lough have shown key sites for wintering bird species but also showed a worrying lack of some species. For example, despite being a qualifying species for the Donegal SPA, there was no Common Scoters (*Melanitta nigra*), detected during the 2020 winter aerial survey of the site.
- ESAS survey in Donegal Bay showed importance of the site for priority species currently in unfavourable condition which do not breed in significant numbers in the immediate area. These include the species Puffin and Manx Shearwater.
- It would be beneficial in future to build on the datasets produced by MarPAMM, SeaMonitor, and COMPASS by combining oceanographic models with sea bird distribution information.

Recommendations for future management.

Due to Covid-19 and other issues, it was not possible to progress as much work on Common Scoter as originally planned so further work on sea ducks on the Donegal coast would be useful to identify key populations and areas. This is especially important considering the lack of Common Scoter seen during the 2020 Donegal Bay Aerial Survey. Further productivity monitoring of the Kittiwake sites should be undertaken to monitor future changes.

Further tracking of seabirds is required in this sea area; in the short-term the priorities should include recovery of

1. Already deployed tracking devices (such as GLS on Fulmar, Manx Shearwater); and
2. Deployment of remaining devices for the purpose they were intended (if required to supplement analysed and reported data to incorporate into scientific papers for subsequent publication – on the understanding that the devices/data belongs to the MarPAMM project; Covid-19 and Highly Pathogenic Avian Influenza (HPAI) have had significant impacts in all years except 2019).
3. In the longer-term, tracking should increase the range of species where possible and concentrate on those key sites where experience has been gained.
    a. These might include The Maidens, Rathlin, Inishtrahull, Tory Island and Donegal Bay.

Cliff-nesting Seabirds in Northern Ireland.

On Rathlin Island 9 of the 13 species surveyed showed positive population trends, meanwhile on the North Antrim coast only 4 of the 13 species showed positive trends. Shag (*Gulosus aristotelis*), Razorbill (*Alca torda*) and Kittiwake (*R. tridactyla*) all showed different trends between the two survey areas, with all three increasing on Rathlin Island and decreasing on the North Antrim coast. Both Puffin and Black-headed gulls showed notable declines on Rathlin Island, with the latter facing near-extinction on the island. Key recommendations include increasing the frequency of the censuses of key seabird sites like Rathlin Island and collecting more demographic data for the area.

Population Viability Analysis.

The PVA report produced under the MarPAMM Seabird Modelling WP aimed to investigate population-level impacts of changes in breeding success and adult survival of seabirds. The report found that species which lay more than one egg benefited more from increases in breeding success, while species that only laid a single egg tended to benefit more from increases in adult survival. From these results the report identified potential management interventions to protect seabirds, focusing on increasing either adult survival or breeding success, depending on the life history traits of the target species. Increasing prey availability could benefit all species of seabirds, while managing invasive predators will more greatly benefit burrow nesting species.

Black Guillemot foraging ecology and diving behaviour (in relation to areas with strong tidal currents) report, NI.

The construction of tidal stream turbines may alter habitat used by inshore foraging seabirds. One such species is the benthic diving Black Guillemot (*C. grylle*), which associates with areas of strong tidal currents for foraging. Black Guillemots dive to the depths at which turbine blades operate and are therefore at potential risk of collision. The extent to which turbines will impact Black Guillemots is currently limited by gaps in our knowledge of the species' diving behaviour exhibited at foraging locations. To address these gaps, tracking of breeding adult Black Guillemots using GPS/Temperature Depth Recorder (TDR) tags was conducted to examine habitat use and dive depths around the Copeland Islands in Northern Ireland, an area associated with strong tidal currents, during the 2021 breeding season.

Birds were found to remain close inshore (<5 km) in relation to the breeding colony and used distinct and individualistic foraging areas. Through the novel combination of GPS and TDR records, maximum dive depths were observed to correspond with

seafloor depth profiles, indicating benthic foraging behaviour. Birds were found to exhibit both benthic and mid-water dives in areas of high oceanic kinetic energy. Bathymetries, benthic substrate, and kinetic energy associated with foraging were often found to be individual-specific. Greatest variation in habitat selected between individuals was seen in relation to kinetic energy and substrate. Overall, birds often used areas of fast flowing currents, remaining within the shallow circalittoral (10 to 30 m) bathymetry zones, despite greater depths being available (Johnston *et al*., 2022).

Marine Mammals Modelling work package outputs.

The North Coast - North Channel is home to a diverse variety of marine mammal species, from cetaceans to pinnipeds. The grey seal (*H. grypus*) is the UK and Irelands most abundant seal species. There are approximately 8000-10,000 grey seals (Seal Rescue Ireland, 2022), on the island of Ireland, protected under the Irish Wildlife Act 1976 (Revised), The Wildlife (Northern Ireland) Order 1985 (as amended) (and under Annex II of the EU Habitats Directive (92/43/EEC).

5 designated Special Areas of Conservation are located in Donegal protecting breeding grounds for grey seals, these are; Slieve Tooey, Tormore Island, Lough Beg Bay, Horn Head and Rinclevan (Ó Cadhla *et al*., 2013) with five other sites throughout Ireland. In 2005 approximately 795-1022 grey seals were counted across the coastline of Donegal (O'Cadhla *et al*., 2008). In 2018 505 grey seals were counted through known haul-out sites across Ireland (Morris *et al*., 2018). In the RoI large seal counts have been discovered in Donegal. Breeding season in Ireland ranges from September to December, with pupping season occurring from October to February.

Within the management plan area there are several identified, important grey seal (*H. grypus*) haul-out sites due to the abundance of food sources and hidden bays along the coastal region. Unfortunately, human disturbance is a serious threat that grey seals face within this region. Disturbances to pupping locations may disturb mothers, leading to the potential increase in abandoned pups (Cronin *et al.,* 2014). Breeding and pupping seasons are sensitive times for seals, especially seal pups as they are highly vulnerable at this stage in their life and during this time will spend most of their time onshore (Russell *et al*., 2019).

Pups are most vulnerable for the first 3 - 4 weeks after birth as they are ashore, susceptible to crushing by adult seals and impacted by storm surges. Within this period, it is crucial that there are protected sites for pups to rest and develop. Disturbances during this vulnerable time may force pups into the water which may

result in the pup's developing hypothermia or drowning. It should be noted that often disturbance is accidental and reported abandoned seal pups in many cases can be rescued, treated in rehabilitation centres, and rereleased across the UK and Ireland (Wilson *et al.,* 2021). In addition, as benthic feeders', seals are increasingly exposed to noise pollution. Other anthropogenic interference from construction or marine developments can lead to noise pollution which causes harm to grey seals by masking their vocalisations in which they use to communicate and may cause temporary deafness, reducing the hearing threshold (Trigg *et al.,* 2018) which usually ranges from 50 Hz - 80 kHz. Noise pollution at this level often occurs within busy shipping channels (Chen *et al.,* 2017).

Shipping traffic within the management plan area can also be a cause of harm to many marine mammals including Harbour Porpoise (*P. phocoena*). During a study reviewing the interactions and impacts between Harbour Porpoise (*P. phocoena*) and shipping vessels within Swansea Bay and the south Gower coast in southwest Wales by Oakley *et al.,* a significant correlation was observed between the number of vessels present and the number of harbour porpoise sightings (Oakley *et al.,* 2017). Vessels ranged from large cargo ships to recreational vessels such as jet skis and stand-up paddleboards, with the most common being recreational shipping vessels. No positive reactions to vessels from harbour porpoise (*P. phocoena*) were observed, with steady speed vessels accounting for 70% of all negative interactions with harbour porpoise (*P. phocoena*). 69% of behavioural reactions occurred when vessels were located approx. 200m from individuals (Oakley *et al*., 2017). Further investigation into these reactions revealed foraging and feeding behaviour appeared to significantly reduce depending on vessel type and the speed at which is travelling, suggesting that shipping traffic, does have a negative influence on the ecological behavioural patterns of harbour porpoise (*P. phocoena*) (depending on the location and number of individuals within the area) (Oakley *et al*., 2017).

Marine litter is another pollutant of ever-growing concern for coastal species. Incidents of larger marine mammals such as dolphins, whales, and seals ingesting plastics (Desclos *et al.,* 2022) and/or becoming entangled in negligently discarded fishing gear (Luck *et al.,* 2022) have greatly increased and are often linked to peak tourism seasons. Awareness of these situations are crucial to the successful conservation of grey seals and cetaceans.

The ability of Passive Acoustic Monitoring (PAM) to provide year-round high resolution temporal data on grey seal presence could be a valuable complement to existing monitoring efforts. Traditionally grey seal population studies have involved visual counts at haul-out sites and the use of satellite telemetry. Both techniques provide a wealth of information on species abundance, population health and spatial distribution.

The addition of non-invasive PAMv to grey seal monitoring schemes, however, may provide the opportunity for interrogation of temporal dynamics in species presence. PAM has the potential to play a future role in monitoring harbour seal populations in important coastal waters within this management plan area.

Benthic Habitat and Species Modelling work package outputs.

Fan mussel habitat suitability model.

The fan mussel *(Atrina fragilis)* has been listed as a priority marine feature for MPA designation in Scotland and Northern Ireland. Due to their rarity a model has been developed and used to predict the distribution of fan mussel habitat within the project area, as part of the MarPAMM project.

The modelled output (Figure 13) is a map of predicted density of fan mussel records. Areas predicted to have an intensity of records greater than a threshold, represented suitable habitats. The threshold was chosen to result in a sensitivity of 0.9 in the species records. The suitable areas were assessed against the MarPAMM MPA management regions and Marine Protected Areas to analyse replication and representation in the project area. As fan mussel are a benthic species, only MPAs that include at least one benthic species as a protected feature were included. The model predicts that approximately 48.56% of the total area of benthic MPAs included in the modelled area is suitable habitat for fan mussel.

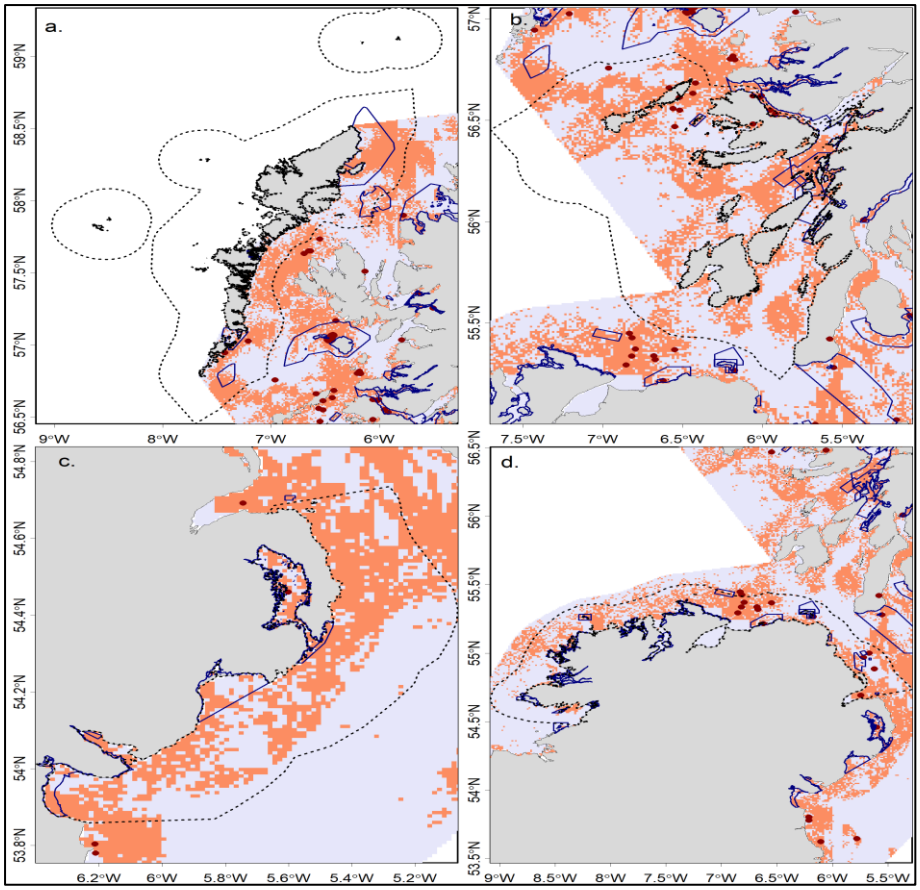

Figure 13. The MPAs containing predicted habitat suitable for fan mussel (*A. fragilis*) and confirmed records for each MarPAMM MPA Management region; a) Outer Hebrides, b) Argyll, c) County Down to County Louth and d) North Coast Ireland to North Channel. Pale blue area is the extent of the modelled domain (Langton *et al.*, 2022c).

Sea-pen habitat distribution model.

Sea-pen habitats have been listed as a "*threatened and declining habitat*" under the 1992 Oslo Paris (OSPAR) Convention (Langton *et al*., 2022b). The MarPAMM region overlaps with region III Celtic Seas where this habitat is in notable decline. Sea-Pens are considered important indicator species with regards to negligent fishing activities within soft sediment areas and communities characterised by sea pens are protected by MPAs in Scotland and Northern Ireland (Langton *et al.*, 2022b).

MarPAMM have developed a model (Figure 14) to predict the distribution of habitats of three sea pen species within the project area. *Funiculina quadrangularis* (Western Scotland), *Pennatula phosphorea* (Western Scotland) and *Virgularia mirabilis*. The areas of suitable habitat were intersected with the MarPAMM MPA management regions and Marine Protected Areas to assess replication and representation in the

project area (Langton *et al.,* 2022b). As sea pens are benthic species, only MPAs that include at least one benthic species as a protected feature were included.

Model extent within the area was restricted by the available environmental data and therefore does not cover the full extent of all the management regions. The model predicts that all the MarPAMM regions contain habitat that is suitable for each of the three species.

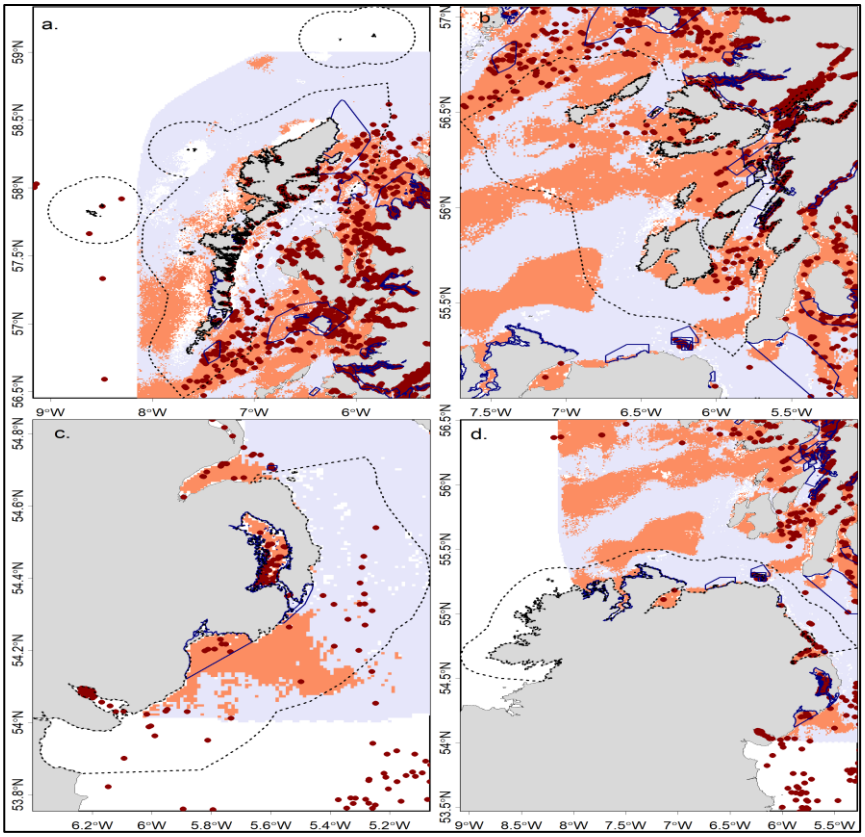

Figure 14. The MPAs containing a mean (N=1000) species richness of at least one sea pen and confirmed records of sea pen for each MarPAMM MPA Management region; a) Outer Hebrides, b) Argyll, c) County Down to County Louth and d) North Coast Ireland to North Channel. Pale blue area is the extent of the modelled domain (Langton *et al.,* 2022b).

Sandeels habitat suitability model.

Sandeels are an important prey species for seabirds and marine mammals and considered a key component of the marine food web. As part of the MarPAMM project, a model has been developed and used to predict the distribution of lesser sand eel habitat within the project area (Langton *et al*., 2021).

Data for lesser sand eel (*Ammodytes spp.*) populations were collated from bottom trawl surveys using Grande Overture Verticale (GOV) trawls, downloaded from the DATRAS database and included data spanning from 1985 to 2018 (DATRAS, 2022).

The modelled output (Figure 15) is a map of predicted probability of presence and density given presence of lesser sandeel records. Areas that were predicted to have a 10% probability of sand eel presence were in the top 5 percentile of densities and considered to represent suitable habitat (Langton *et al.,* 2021). The suitable areas were intersected with the MarPAMM MPA management regions and Marine Protected Areas to assess replication and representation in the project area (Langton *et al.,* 2021).

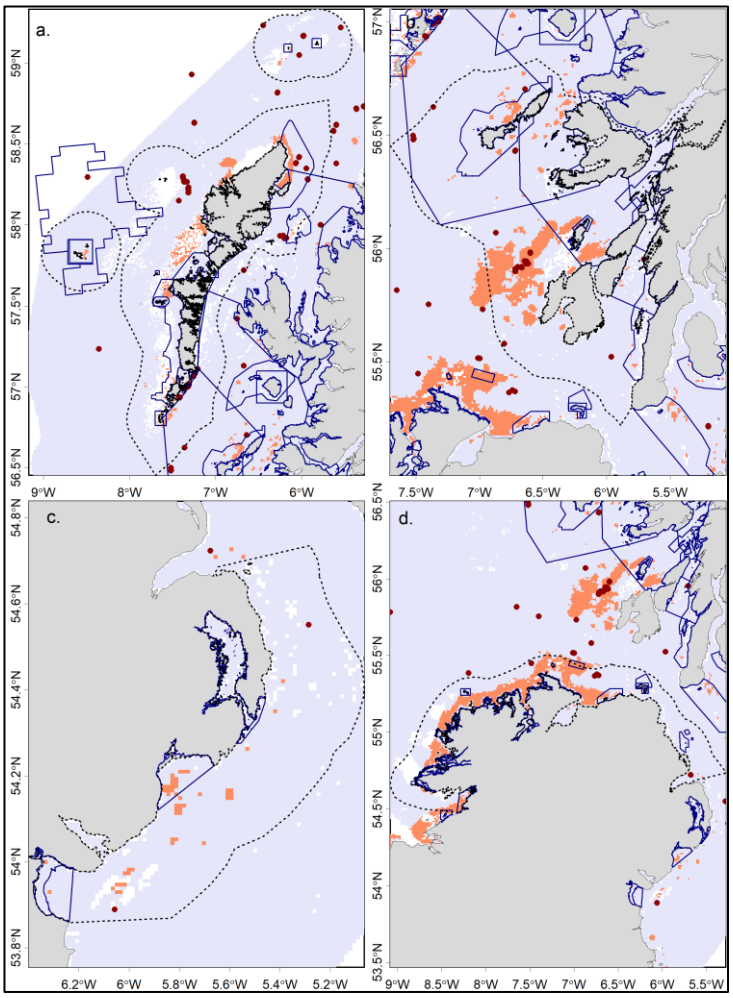

Figure 15. The MPAs containing predicted habitat suitable for lesser sandeel (*Ammodytes spp.*) and confirmed records for each MarPAMM MPA Management region; a) Outer Hebrides, b) Argyll, c) county Down to County Louth and d) North Coast Ireland to North Channel. Pale blue area is the extent of the modelled domain (Langton *et al.*, 2021).

Sea fan species complex habitat suitability model.

The marine coral Sea fan species complex comprises of two species: Northern Sea fan and the Pink Sea fan. Both species are protected under National and European legislation and are designated features of MPAs across the management plan area (Langton, 2022a). As part of the MarPAMM benthic habitat and species modelling work package, a model was developed and used to predict the distribution of the Sea fan complex habitat within the Interreg VA area (NI, RoI and WS; Langton, 2022a).

The model output (Figure 16) was a map depicting locations of Sea fan complex density (Langton *et al.,* 2022a). The areas that had the highest 5% of predicted intensity were considered suitable habitat. The model predicts that approx. 12.08% of the total area of benthic MPAs included in the modelled area is suitable habitat for Sea fan complex (Langton *et al.,* 2022a).

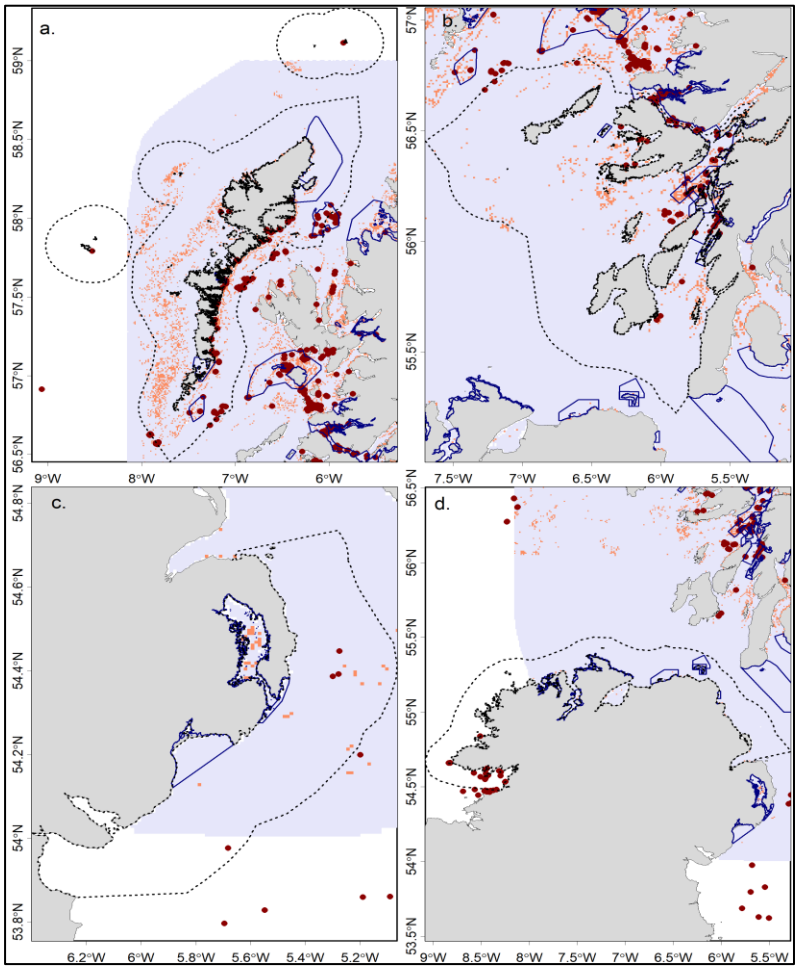

Figure 16. The MPAs containing predicted habitat suitable for sea fan complex and confirmed records for each MarPAMM MPA Management region; a) Outer Hebrides, b) Argyll, c) County Down to County Louth and d) North Coast Ireland to North Channel. Pale blue area is the extent of the modelled domain (Langton *et al*., 2022a).

Horse Mussel (M. modiolus) habitat suitability modelling output.

Within the MarPAMM region, 0.11% of the modelled area (Figure 17) is predicted to be most suitable habitat for the formation of Horse mussel *(M. modiolus) beds,* 9.41% is predicted to be less suitable habitat and 90% is predicted to be unsuitable habitat (Brown, 2022). Within the North Coast – North Channel management plan area, 0.04% of the modelled extent is predicted to be a suitable habitat for the horse mussel (*M. modiolus)* beds, while 33.81% is predicted to be less suitable and 66.15% is predicted to be unsuitable (Brown, 2022). Within in the management plan area, there are 13 designated MPAs and 51.00% of the area is predicted to be the most suitable for habitats, while 2.92% of the area is predicted to be less suitable (Brown, 2022).

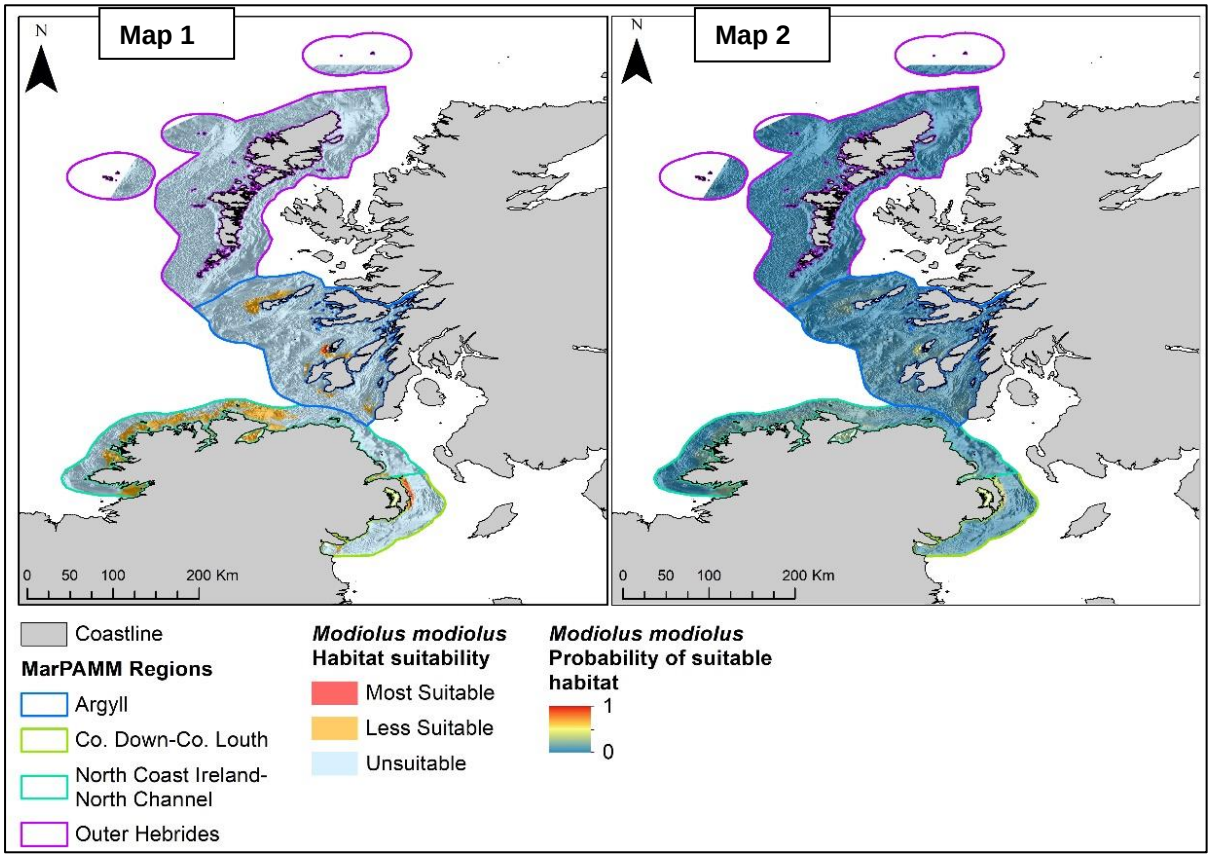

Figure 17. Habitat suitability maps for horse mussel (*M. modiolus*) beds. Map 1 represents the suitability in categories whereas Map 2 represents the probability of there being suitable habitat on a continuous scale, where 0 represents no probability and 1 represents a high probability of suitability (Brown, 2022).

Ocean Quahog (A. islandica) habitat suitability modelling output.

Within the MarPAMM region, 37.48% of the area is predicted to be most suitable habitats for ocean quahog (*A. islandica)* (Figure 18), 29.29% predicted to be less suitable, and 33.22% is predicted to be unsuitable habitat (Brown, 2022). Within the North Coast - North Channel region, 18.88% of the modelled extent is predicted to be suitable habitat for ocean quahog (*A. islandica*,) 27.41% is predicted to be less suitable for their formation and 53.71% is predicted to be unsuitable. There are 13 MPAs designated within the North Coast – North Channel MPAs management plan area, of which 6.10% is predicted to be most suitable and 3.19% of the area predicted to be less suitable habitat (Brown, 2022).

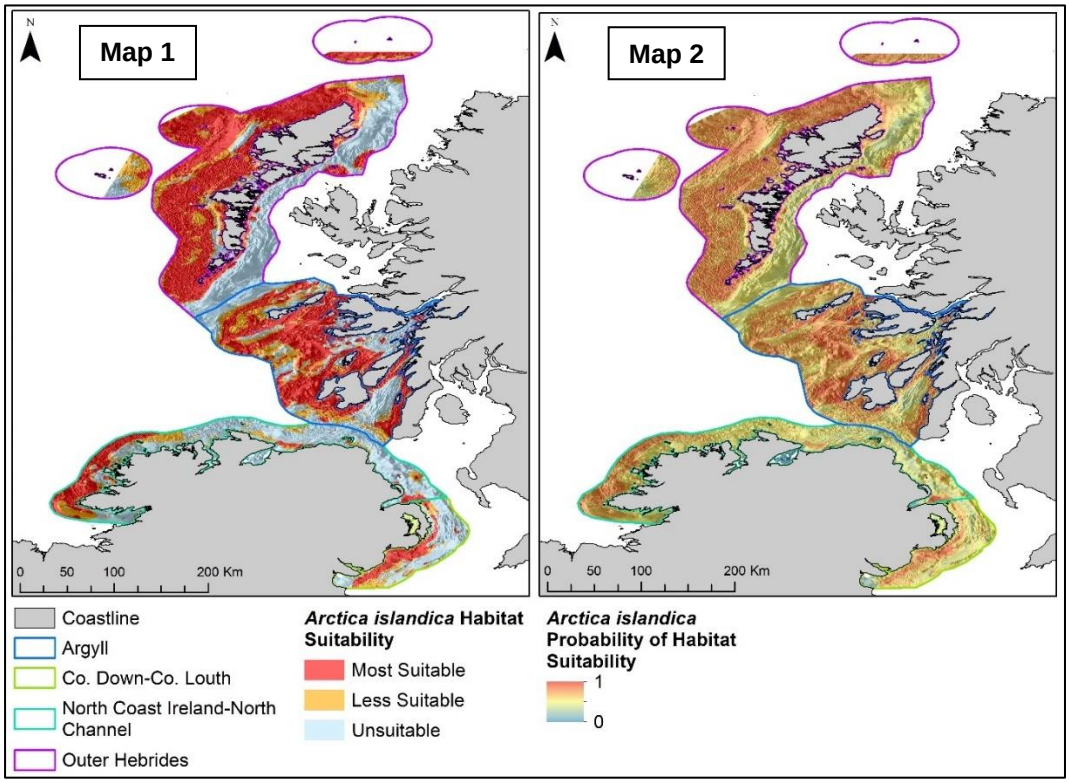

Figure 18. Habitat suitability maps for ocean quahog (*A. islandica*). Map 1 represents the suitability in categories whereas Map 2 represents the probability of there being suitable habitat on a continuous scale, where 0 represents no probability and 1 represents a high probability of suitability (Brown, 2022).

Maerl (Lithothamnion spp.*) habitat suitability modelling output.*

Of the predicted extent of the MarPAMM region: 5.60% is predicted to be most suitable habitat for maerl (*Lithothamnion* spp.) (Figure 19), 6.01% is predicted to be less suitable habitat with 88.38% predicted to be unsuitable (Brown, 2022). Within the

management plan area, 8.10% of the modelled extent is predicted to be a suitable habitat for maerl (*Lithothamnion* spp.), 7.65% is predicted to be less suitable for their formation and 84.26% is predicted to be unsuitable (Brown, 2022). There are 13 existing MPAs within the management plan, of which 13.50% of the area predicted to be less suitable habitats for maerl *(Lithothamnion* spp.*).*

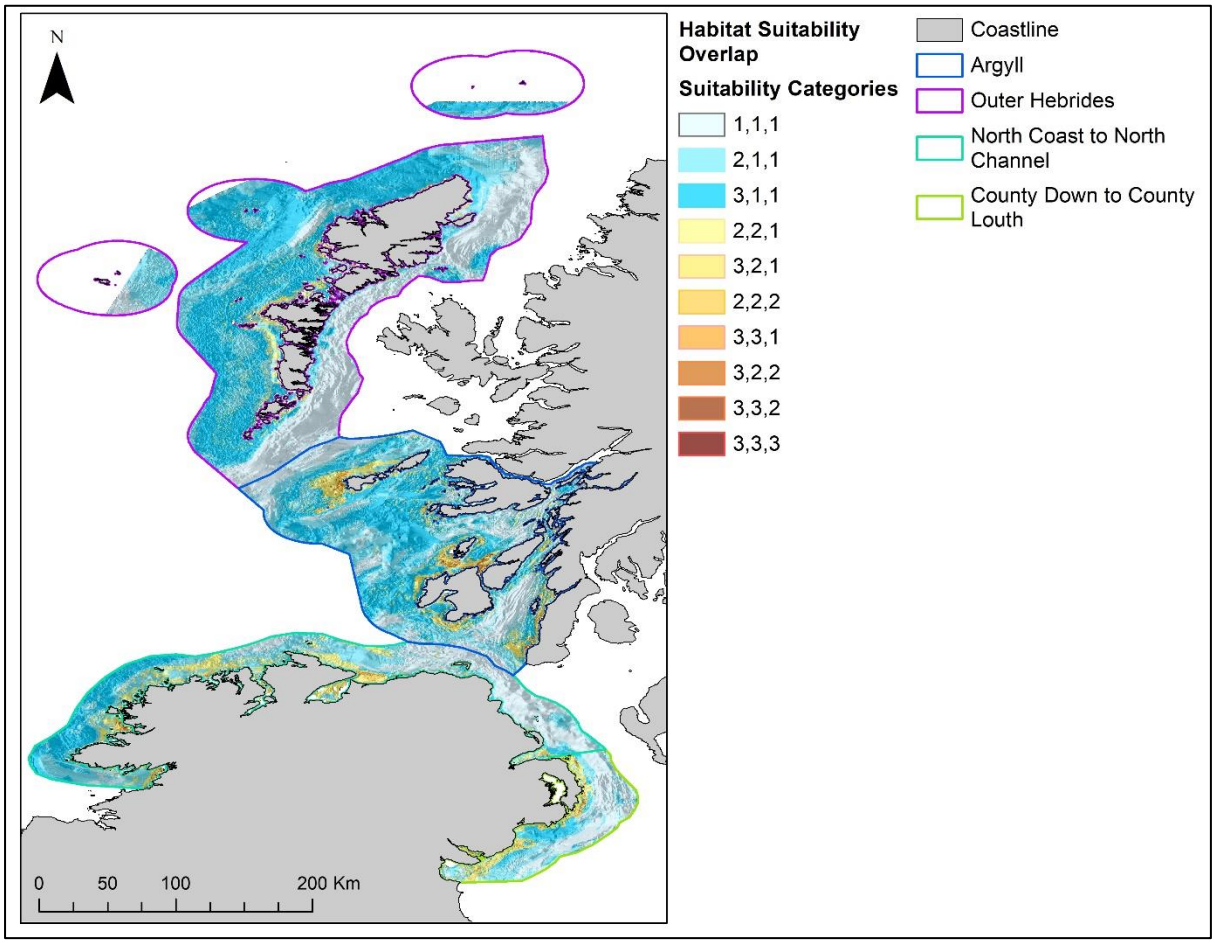

Figure 19. A map representing locations where suitable habitat between horse mussel (*M. modiolus*) beds, Ocean Quahog (*A. islandica*) and maerl (*Lithothamnion spp.)* (. Overlaps. Habitat suitability in this map has been coded, where 3 = "Most suitable", 2 = "Less Suitable" and 1 = "Unsuitable". Each category is assigned three habitat suitability numbers. Locations which have been assigned the code 3,3,3 = locations which are likely to be "Most suitable" habitat for all three of the modelled species, 2,2,2 = Locations which are likely to be "Less suitable" habitat for all three species and 1,1,1 = Locations which are likely to be "Unsuitable" habitat for all three species.

All marine and coastal developments should be aware of these benthic mapping distributions when reviewing planning proposals to make sure that areas aren't compromised for future growth or improvement to sustainability for these features. With regards to habitat and feature restoration, within the primary stage, organisations

involved in restoration or identification of areas for new habitats should use the modelling from the benthic works package to aid site selection suitability.

Steering Group Future.

The Regional MPA Management Steering Group was created to create a platform for stakeholders to engage and assist on the development of management policy, as well as detailed revisions of the policy iterations. The process enabled stakeholders to work with MarPAMM scientific outputs to help develop management which would aid sustainability.

The department (DAERA & DGHLG) should look at mechanisms to sustain the Steering Group with the intention of developing it into a Marine Advisory Group. The future of this group should be evolved for the purpose of evaluation and review to help the monitoring of plan guidance effectiveness from industry and activity users. New funding avenues should be considered to help support the development of a marine advisory group through the next round of European funding (post Brexit) through the Peace Plus programme. This will help to evolve and grow the skills of Steering Group members for the benefit of future decision making within the plan area.

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Appendix 1: Stakeholder Engagement Report.

TCI Engagement - Final Report to AFBI, re MarPAMM project January 2022.

1. Background.

TCI Engagement (TCIe) was commissioned by AFBI in autumn 2019, after competitive tender, to assist with Stakeholder Management activities during the MarPAMM project, then scheduled until autumn 2021 (subsequently extended by mutual agreement, by reason of the Covid pandemic, until January 2022).

TCIe specialises in stakeholder management and managing public consultation, through advice and guidance, training, and other relevant support. An agreed work plan, which was updated and refined during the project and guided TCIe and MarPAMM officers, ensuring efficient project management.

Significant components of the work plan covered:

- Stakeholder identification, profiling and mapping
- Risk Assessment and mitigation
- Stakeholder communication and engagement
- Database management and monitoring
- Responses to stakeholder enquiries
- Production of online content (social media, web etc)
- Servicing meetings through alerts, agendas, minutes etc

The engagement plan has been delivered to deadline, and to budget.

2. How were stakeholders recruited into the MarPAMM project?

After wide promotion, a well-attended in-person seminar in December 2019 engaged participants in a detailed discussion on Stakeholder Mapping and Consultation / Engagement Risk Management.

Stakeholders were identified as those who will be affected and impacted by the decisions recommended through this policy drafting process. This includes stakeholders who live, work, use or have an interest in the areas and the topics. Activists, officials, farmers, fishers, campaigners, lobbyists, academics, trade associations, other public bodies, environmental and conservation groups all fall under the umbrella term of stakeholders.

Once stakeholders were identified and profiled (who are they, whom do they represent?), the process of stakeholder mapping was undertaken: this is an iterative, matrix-based process, drawing on and contributing to corporate memory; it allows for amendments to stakeholder involvement to be made as the project evolves; it also aids resource allocation, targeting and eliminates wasteful activities.

The process of stakeholder management also involves the categorisation of key stakeholders into key areas, policy objectives and geographical locations (e.g., Murlough SAC group, Carlingford SAC group and Regional SAC group; these three geographies were selected to maximise efficiencies and reflect each locality's needs).

3. How did this convert into Steering Groups and what did the Steering Groups achieve?

Stakeholder mapping led to the formation of three Steering Groups made up of representative stakeholders as described above. These Steering Groups were designed to facilitate engagement with stakeholders to benefit from site-specific knowledge and expertise on the coastal areas included in the MarPAMM project.

Steering Groups provided a platform for stakeholders to raise concerns about the pressures and unanticipated issues they felt were facing coastal areas, whether that be in their line of work, their property, communities or as recreational visitors.

They also facilitated information-sharing, issue debates and sharing of ideas, updating on the project and its direction, as well as engaging special interest / single issue groups.

Overall, Steering Groups provided the opportunity for stakeholders to be directly involved in the drafting process which will inform policy implementation in their areas.

TCIe facilitated online protocols and a Code of Conduct that guided participants in best practice, ensuring strong impacts.

At all times GDPR and data security protocols were noted and fully observed.

Covid19: Rethinking stakeholder engagement and initial approaches made to transfer MarPAMM engagement online.

In light of Covid19 from March 2020, compliance required that adjustments be made to the management of stakeholder engagement, to facilitate online communication in place of in-person face-to-face activity, to ensure the safety of all participants. Reduced activity during lockdowns also meant that some activities were suspended, or rescheduled (including by agreement, the TCIe contract, which was extended to January 2022.

The video conferencing and meeting platform Zoom, curated, and provided by TCIe, allowed for stakeholder meetings to be conducted online, in accordance with public health advice. Features such as breakout rooms, online polling (via Sli.do) and screen-sharing allowing for personable experiences for stakeholders. Chairs reported improved delegate contributions, more manageable discourse and less time-wasting; sessions began and ended on time; the Chairs were respected and advice from support staff followed.

The platform established by TCIe with a dedicated MarPAMM email address and central hub, for information and data sharing, worked well, with all correspondence tracked and archived when appropriate; meeting alerts, calendar invites, agendas, Friday / Tuesday reminders and follow-ups were all undertaken efficiently.

In addition, to ensure inclusivity for all stakeholders, detailed minutes were circulated after each meeting, with supporting papers, to keep those unable to attend up-to-date on project direction and stakeholder interaction with project officers.

Online written materials such as website updates and newsletters were circulated, with the purpose of keeping stakeholders informed about project activities across the three Irish region Steering Groups and MarPAMM partners from across the project.

While issues surrounding internet connectivity (broadband width) and ICT resource and hardware constraints occasionally arose for some stakeholders through this process, the email system requires less technical resource, and Zoom allowed for stakeholders to participate in meetings in a time-efficient and convenient manner from a PC, tablet or mobile device.

Social media platforms (Twitter and Facebook) provide convenient tools for stakeholder engagement. Small bite-sized pieces of information, with relevant graphics, photographs and video content was available to a wide audience, increasing the reach of, interest in, and impact of the project.

Please see selected graphs below showing engagement with MarPAMM social media outlets.

4. Benefits of the MarPAMM project - policy guidance and drafting.

The core objectives of the MarPAMM project were to deliver four novel models designed to support the conservation of habitats and species that underpin Marine Protected Area (MPA) designations within the eligible region.

MarPAMM is an environment project to develop tools for monitoring and managing several protected coastal marine environments in Ireland, Northern Ireland and Western Scotland. It will be completed by 31 March 2022.
It is a cross-border project because many marine species and habitats do not abide by administrative borders. To manage mobile species and border areas requires cooperation.
MarPAMM partners will collect data on the abundance, distribution and movement of marine protected species and habitats. These data will help us produce new habitat maps and develop models for a range of species, including connectivity assessment for species with mobile life stages.
We will produce a regional sea bird model, a regional model of protected seabed-dwelling species and habitats, a seal foraging and underwater noise model and a coastal processes model.

Stakeholder engagement is important as it helps to address gaps within current marine conservation policy by identifying the up-to-date issues and pressures that face these areas, from experts active in the areas.

As marine species and habitats do not abide by administrative borders the cross-border element of the MarPAMM project was vital, building and cementing relationships and networks of future value. MarPAMM believes that MPAs work better when they arise from a point of connectivity between the geographies and the personnel servicing those areas. Therefore, objectives included deployment of a collaborative cross-border approach involving rich and extensive, meaningful stakeholder engagement; this worked productively.

Another benefit of the MarPAMM project was the importance placed upon connectivity between species and habitats. MarPAMM has potentially created sustainable networks, which provide an interdisciplinary approach (quantitative science packages and qualitative stakeholder engagement) to MPA research, leading to more concerted, coherent and impactful actions.

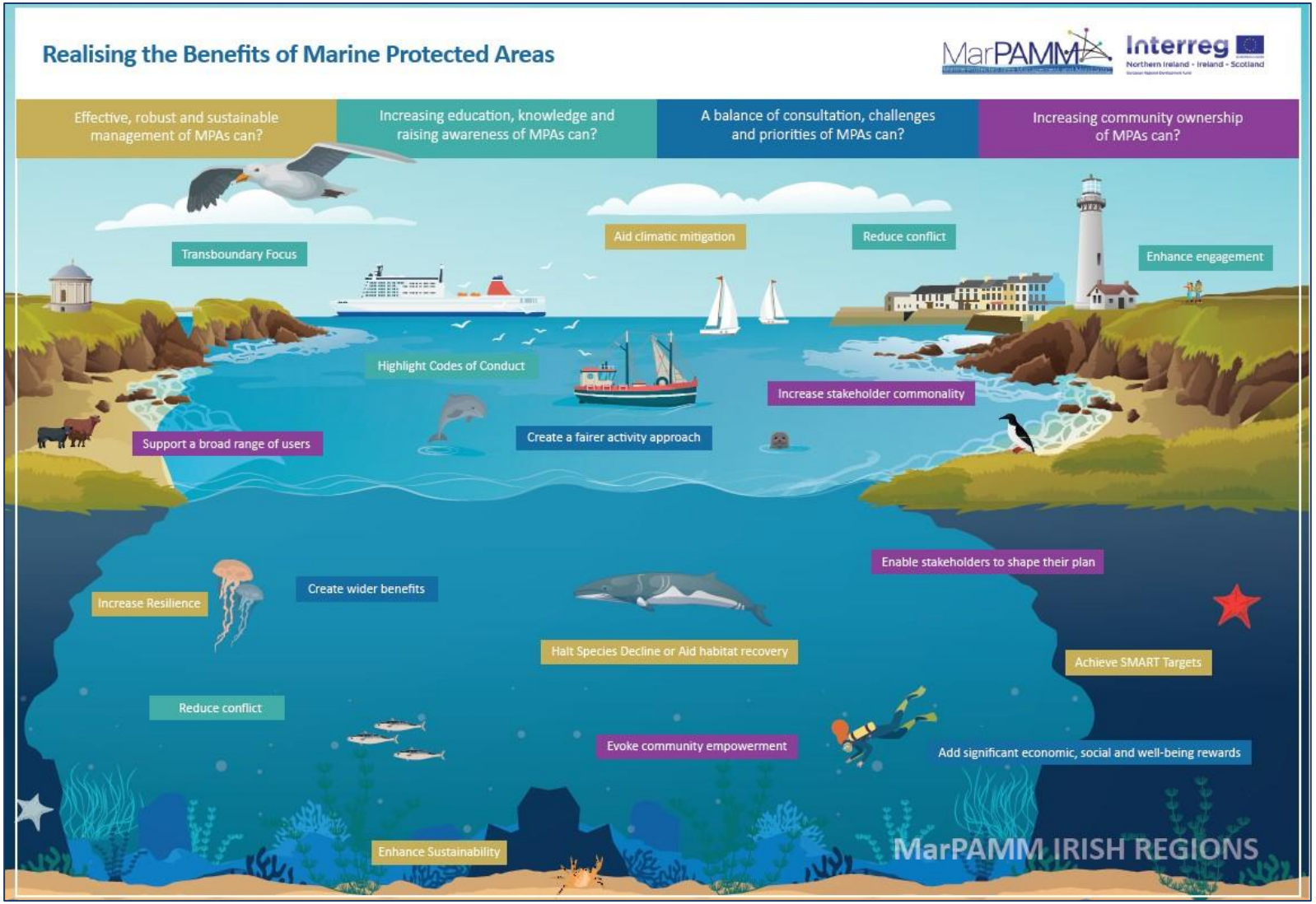
5. Result: Finished policy guidance draft brought back to stakeholders.

The result of the MarPAMM project is a policy guidance document, which will provide coastal users / environmental organisations / stakeholders / local government / other non-departmental public bodies (NDPBs) / other departments and DAERA itself with information about MPA areas, and best practice that meets conservation objectives.

This policy guidance document along with the accompanying social media / online engagement will improve the reach and visibility of marine work of this sort being conducted by MarPAMM; the model can also ensure embedding of the proceeds of the connectivity described above between geographies, disciplines and marine mammal – and many other – species.

Effective stakeholder engagement in turn strengthens relationships, causing deeper involvement, interactions and possible co-management of future programmes.

Appendix 2: Regional Steering Group Infographic.



Appendix 3: Full outline of designated features within North Coast- North Channel Region.

List of all SPAs, SACs, MCZs and ASSIs within the North Coast – North Channel Region. These include all species and habitats from the designated sites from Inishmurry in Co Sligo to Inner Belfast Lough in Co Antrim.

Seabirds:

Area	Feature
Inishmurray SPA	Shag (*Phalacrocorax aristotelis*), breeding
	Barnacle Goose (*Branta leucopsis*), wintering
	Herring Gull (*Larus argentatus*), breeding
	Storm Petrel (*Hydrobates pelagicus*), breeding
	Lesser Black-backed Gull (*Larus fuscus*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Common Gull (*Larus canus*), breeding
Durnesh Lough SPA	Whooper Swan (*Cygnus cygnus*)
	Greenland White-fronted Goose (*Anser albifrons flavirostris*)
Donegal Bay SPA	Great Northern Diver (*Gavia immer*), wintering
	Common Scoter (*Melanitta nigra*), wintering
	Light-bellied Brent Goose (*Branta bernicla hrota*), wintering
	Sanderling (*Calidris alba*), wintering
	Black-throated Diver (*Gavia arctica*), wintering
	Red-throated Diver (Gavia stellata), wintering
	Red-breasted Merganser (*Mergus serrator*), wintering
Inishduff SPA	Storm Petrel (*Hydrobates pelagicus*), breeding
	Barnacle Goose (*Branta leucopsis*), wintering
	Shag (*Phalacrocorax aristotelis*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Herring Gull (*Larus argentatus*), breeding
	Eider (*Somateria mollissima*), breeding
	Storm Petrel (*Hydrobates pelagicus*), breeding
Rathlin O'Birne Island SPA	Storm Petrel (*Hydrobates pelagicus*), breeding
	Lesser Black-backed Gull *(Larus fuscus*), breeding
	Barnacle Goose (*Branta leucopsis*), wintering
	Fulmar (*Fulmarus glacialis*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Herring Gull (*Larus argentatus*), breeding
	Eider (*Somateria mollissima*), breeding
	Common Tern (*Sterna hirundo*)
	Arctic Tern (*Sterna paradisaea*)
	Black Guillemot (*Cepphus grylle*), breeding
West Donegal Coast SPA	Fulmar (*Fulmarus glacialis*), breeding
	Razorbill (*Alca torda*), breeding

	Kittiwake (*Rissa tridactyla*), breeding
	Herring Gull (*Larus argentatus*), breeding
	Cormorant (*Phalacrocorax carbo*), breeding
	Shag (*Phalacrocorax aristotelis*), breeding
	Black Guillemot (*Cepphus grylle*), breeding
	Guillemot *(Uria aalge*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Atlantic Pufin (*Fratercula arctica*), breeding
	Lesser Black-backed Gull (*Larus fuscus*), breeding
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
	Greenland White-fronted Goose (*Anser albifrons flavirostris*), wintering
	Barnacle Goose (*Branta leucopsis*), wintering
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
	Whooper Swan (*Cygnus cygnus*), wintering
Sheskinmore Lough SPA	Greenland White-fronted Goose (*Anser albifrons flavirostris*), wintering
	Barnacle Goose (*Branta leucopsis*), wintering
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
	Whooper Swan (*Cygnus cygnus*), wintering
Inishkeel SPA	Barnacle Goose (*Branta leucopsis*), wintering
	Great Northern Diver (*Gavia immer*), wintering
	Eider (*Somateria mollissima*), wintering
Roaninish SPA	Greenland White-fronted Goose (*Anser albifrons flavirostris*), wintering
	Barnacle Goose (*Branta leucopsis*), wintering
	Storm Petrel (*Hydrobates pelagicus*), breeding
	Arctic Tern (*Sterna paradisaea*), breeding
	Shag (*Phalacrocorax aristotelis*), breeding
	Cormorant (*Phalacrocorax carbo*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Herring Gull (*Larus argentatus*), breeding
	Eider (*Somateria mollissima*), breeding
Illancrone and Inishkeeragh SPA	Barnacle Goose (*Branta leucopsis*), wintering
	Arctic Tern (*Sterna paradisaea*)
	Little Tern (*Sterna albifrons*)
	Herring Gull (*Larus argentatus*)
	Common Gull (*Larus canus*)
West Donegal Islands SPA	Shag (*Phalacrocorax aristotelis*), breeding
	Barnacle Goose (*Branta leucopsis*), wintering
	Herring Gull (*Larus argentatus*)
	Common Gull (*Larus canus*)
Tory Island SPA	Atlantic Puffin (*Fratercula arctica*), breeding
	Fulmar (*Fulmarus glacialis*), breeding
	Razorbill (*Alca torda*), breeding
	Kittiwake (*Rissa tridactyla*), breeding
	Shag (*Phalacrocorax aristotelis*), breeding
	Guillemot (*Uria aalge*), breeding

	Arctic Tern (*Sterna paradisaea*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Herring Gull (*Larus argentatus*), breeding
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
	Common Gull (*Larus canus*)
	Black-headed Gull (*Chroicocephalus ridibundus*), wintering
Inishbofin, Inishdooey and Inishbeg SPA	Arctic Tern (*Sterna paradisaea*)
	Common Gull (*Larus canus*)
	Lesser Black-backed Gull (Larus fuscus), breeding
	Storm Petrel (*Hydrobates pelagicus*), breeding
Horn Head to Fanad Head SPA	Fulmar (*Fulmarus glacialis*), breeding
	Razorbill (*Alca torda*), breeding
	Kittiwake (*Rissa tridactyla*), breeding
	Shag (*Phalacrocorax aristotelis*), breeding
	Guillemot (*Uria aalge*), breeding
	Greenland White-fronted Goose *(Anser albifrons flavirostris*), wintering
	Barnacle Goose (*Branta leucopsis*), wintering
	Cormorant (*Phalacrocorax carbo*), breeding
	Black Guillemot (*Cepphus grylle*), breeding
	Atlantic Pufin (*Fratercula arctica*), breeding
	Great Black-backed Gull (*Larus marinus*), breeding
	Chough (Pyrrhocorax pyrrhocorax), breeding
	Herring Gull (*Larus argentatus*), breeding
	Common Gull (*Larus canus*)
Greers Isle SPA	Black-headed Gull (*Chroicocephalus ridibundus*)
	Common Gull (*Larus canus*)
	Sandwich Tern (*Sterna sandvicensis*)
	Common Tern (*Sterna hirundo*)
	Arctic Tern (*Sterna paradisaea*)
	Red-breasted Merganser (*Mergus serrator*), breeding
Lough Swilly SPA	Great Crested Grebe (*Podiceps cristatus*)
	Whooper Swan (*Cygnus cygnus*)
	Red-breasted Merganser (*Mergus serrator*)
	Greenland White-fronted Goose (*Anser albifrons flavirostris*)
	Common Tern (*Sterna hirundo*)
	Sandwich Tern (*Sterna sandvicensis*)
	Greylag Goose (*Anser anser*)
	Great Northern Diver (*Gavia immer*), wintering
	Slavonian Grebe (*Podiceps auritus*), wintering
	Common Gull (*Larus canus*)
	Black-headed Gull (*Chroicocephalus ridibundus*)
Trawbreaga Bay SPA	Herring Gull (*Larus argentatus*)
	Whooper Swan (*Cygnus cygnus*)
	Barnacle Goose (*Branta leucopsis*), wintering
	Black-headed Gull (*Chroicocephalus ridibundus*)
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
	Common Gull (*Larus canus*)

Inishtrahull SPA	Shag (*Phalacrocorax aristotelis*), breeding
	Barnacle Goose (*Branta leucopsis*), wintering
	Common Gull (*Larus canus*)
	Kittiwake (*Rissa tridactyla*), breeding
	Fulmar (*Fulmarus glacialis*), breeding
	Lesser Black-backed Gull (*Larus fuscus*), breeding
	Chough (*Pyrrhocorax pyrrhocorax*), breeding
Lough Foyle SPA (RoI)	Red-breasted Merganser (*Mergus serrator*)
	Eider (*Somateria mollissima*)
	Red-throated Diver (*Gavia stellata*)
	Herring Gull (*Larus argentatus*)
	Black-headed Gull (*Chroicocephalus ridibundus*)
	Great Crested Grebe (*Podiceps cristatus*)
	Light-bellied Brent Goose (*Branta bernicla hrota*), wintering
Lough Foyle SPA (NI)	[Canada/Ireland] - Light-bellied brent goose (*Branta bernicla hrota)*
	Bar-tailed godwit (*imosa lapponica)*
	Waterfowl assemblage
Rathlin Island SPA	Peregrine falcon (*Falco peregrinus)*
	Black-legged kittiwake (*Rissa tridactyla)*
	Common guillemot (*Uria aalge)*
	Razorbill (*Alca torda*)
Outer Belfast Lough SPA	Great Cormorant (*Phalacrocorax carbo*)
	Red-breasted Merganser (*Mergus serrator*)
	Ringed Plover (*Charadrius hiaticula*)
	Turnstone (*Arenaria*)
	Great Crested Grebe (*Podiceps cristatus*)
Belfast Lough SPA	Common Tern (*Sterna hirundo)*
	Artic Term (*Sterna paradisaea)*
	Bar-tailed Godwit (*Limosa lapponica*)
Rathlin Island MCZ	Black Guillemot (*Cepphus grille)*

Area	Feature
Lough Foyle ASSI	Great Cormorant (*Phalacrocorax carbo*)
	Eider (*Somateria mollissima*)
	Great Crested Grebe (*Podiceps cristatus*)
	Greylag Goose (*Anser answer*)
	Red-breasted Merganser (*Mergus serrator*)
Bann Estuary ASSI	Breeding bird assemblage
Sheep Island ASSI	Great Cormorant (*Phalacrocorax carbo*)
Carrickarede ASSI	Breeding bird assemblage

Rathlin Island ASSI	Fulmar (*Fulmarus glacialis*)
	Herring Gull (*Larus argentatus*)
	Lesser Black-backed Gull (*Larus fuscus*)
	Atlantic Pufin (*Fratercula arctica*)
	Breeding bird assemblage
Fair Head and Murlough Bay ASSI	Peregrine Falcon (*Falco peregrinus*)
Larne Lough ASSI	Light Bellied Brent Goose (*Branta bernicla hrota*)
	Roseate Tern (*Sterna dougallii*)
	Breeding bird assemblage
	Red-breasted Merganser (*Mergus serrator*)
Portmuck ASSI	Razorbill (*Alca torda*)
Inner Belfast Lough ASSI	Ringed Plover (*Charadrius hiaticula*)
	Turnstone (*Arenaria*)
	Great Cormorant (*Phalacrocorax carbo*)
	Red-breasted Merganser (*Mergus serrator*)

Marine Mammals:

Area	Feature
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	Grey Seal (*Halichoerus grypus*)
Skerries and Causeway SAC	Harbour porpoise (*Phoca phocoena)*
North Channel SAC	Harbour porpoise (*Phoca phocoena)*
The Maidens SAC	Grey Seal (*Halichoerus grypus*)

Benthic Species:

Area	Feature
Red Bay SAC	Maerl bed (*Phymatolithon calcareum*)
Outer Belfast Lough MCZ	Ocean quahog (*Arctica islandica)*

Intertidal:

Area	Feature
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	Mudflats and sandflats
	Large shallow inlets and bays
Donegal Bay (Murvagh) SAC	Tidal Mudflats and Sandflats
St. John's Point SAC	Large shallow inlets and bays
Slieve League SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
Gweedore Bay and Islands SAC	Coastal lagoons
Rutland Island and Sound SAC	Coastal lagoons
	Large shallow inlets and bays
Aran Island (Donegal) Cliffs	Large shallow inlets and bays
Termon Strand SAC	Coastal lagoon
Tory Island Coast SAC	Coastal lagoons
	Vegetated sea cliffs of the Atlantic and Baltic coasts
Ballyness Bay SAC	Estuaries
	Mudflats and sandflats
Horn Head and Rinclevan SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
Sessiagh Lough SAC	Oligotrophic to mesotrophic standing waters
Sheephaven SAC	Mudflats and sandflats
Mulroy Bay SAC	Large shallow inlets and bays
	Large shallow inlets and bays
Tranarossan and Melmore Lough SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
	Mudflats and sandflats
Lough Nagreany Dunes SAC	Oligotrophic to mesotrophic standing waters
Ballyhoorisky Point to Fanad Head SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
Lough Swilly SAC	Estuaries
	Coastal lagoons
Inishtrahull SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts
North Inishowen Coast SAC	Mudflats and sandflats
	Vegetated sea cliffs of the Atlantic and Baltic coasts
ASSI Bann Estuary	Coastal saltmarsh
ASSI Giant's Causeway and Dunseverick	Coastal saltmarsh
ASSI Larne Lough	Coastal saltmarsh

ASSI Caste Point	Intertidal Rock
ASSI Rathlin Island	Intertidal Rock
ASSI Fairhead and Murlough Bay	Intertidal Rock
ASSI Galboly	Intertidal Rock
ASS The Gobbins	Intertidal Rock
Larne Lough ASSI	Saline Lagoons

Subtidal:

Area	Feature
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	Reefs
Durnesh Lough SAC	Coastal Lagoons
St. John's Point SAC	Reefs
Slieve League SAC	Reefs
Rathlin O'Birne Island SAC	Reefs
Gweedore Bay and Islands SAC	Reefs
Rutland Island and Sound SAC	Reefs
Aran Island (Donegal) Cliffs SAC	Submerged or partially submerged sea caves
Tory Island Coast SAC	Submerged or partially submerged sea caves
	Reefs
Rathlin SAC	Reefs
Skerries and Causeway SAC (extended boundary)	Reefs
Maidens SAC	Reefs
Rathlin SAC	Submerged or partially submerged sea caves
Skerries and Causeway SAC (extended boundary)	Submerged or partially submerged sea caves
The **Maidens SAC**	Sandbanks which are slightly covered by sea water all the time
Rathlin Island SAC	Sandbanks which are slightly covered by sea water all the time
Skerries and Causeway SAC (extended boundary)	Sandbanks which are slightly covered by sea water all the time
Red Bay SAC	Sandbanks which are slightly covered by sea water all the time
Waterfoot MCZ	*Zostera marina* Eel Grass beds on subtidal sand
Outer Belfast Lough MCZ	Subtidal sand
Rathlin Island MCZ	Deep seabed
	Geo-diversity- Indicators of change relative sea level

Appendix 4: Detailed Policy Review.

Northern Ireland.

International Legislation.

International legislation that are applicable to the management plan include:

- OSPAR Convention 1992,
- Marine Strategy Regulations 2010,
- Marine and Coastal Access Act 2009, and
- Marine Policy Statement 2011.

Under the OSPAR Convention to Protect the Marine Environment of the Northeast Atlantic, Ireland and the UK are committed to establishing marine protected areas to protect biodiversity (i.e., OSPAR MPAs). The OSPAR Convention aims develop an ecologically coherent network of well-managed MPAs. OSPAR provides a mechanism through collaborative governance with EU and non-EU members to protect the marine environment of the North-East Atlantic. OSPAR includes a wide array of marine issues from work on pollution and dumping at sea to the conservation of marine biodiversity (OSPAR, 2016).

The marine Strategy Regulations 2010 replaces MSFD post-Brexit and provides the framework for delivering marine policy at the UK level. The UK Marine Strategy Regulations 2010 require the UK to take the necessary measures to achieve or maintain Good Environmental Status through the development of a UK Marine Strategy. The UK Marine Strategy sets out a comprehensive framework for assessing, monitoring, and taking action across the UK's seas to achieve the shared vision for 'clean, healthy, safe, productive and biologically diverse ocean and seas. There are strong links between the UK Marine Strategy and River Basin Management Plans (RBMPs). The RBMPs address the improvement and protection of the chemical and ecological status of surface waters over the whole river basin ranging from rivers, lakes, and ground waters through to estuaries and coastal waters out to one nautical mile at sea and overlap with the UK Marine Strategy in coastal waters. The Department for Environment, Food and Rural Affairs (DEFRA) are responsible implementation of the Regulations within the UK, with devolved responsibility for NI delegated to DAERA.

Across the UK, each devolved administration has the power to create Marine Protected Areas to conserve nationally important wildlife and habitats. These national sites have different names in the devolved nations of the UK. The Marine and Coastal Accesses Act 2009, in Northern Ireland gives DAERA's Marine and Fisheries Division the responsibility for licensing of activities related to construction, deposition or

removal of any substance or object as the marine planning process. The Marine Policy Statement 2011 provided the platform for the development for a Northern Ireland Marine Plan ensure the sustainable use of marine resources and 52 strategic management of marine activities from renewable energy to nature conservation, fishing, recreation and tourism.

National Legislation.

National designations that are applicable to the management plan include:

- The Marine Act (Northern Ireland) 2013,
- Water Environment (Floods Directive) Regulations (Northern Ireland) 2009,
- Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017,
- Water (Northern Ireland) Order) 1999,
- The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019,
- The Environment (Northern Ireland) Order 2002,
- Nature Conservation and Amenity Lands Order (Northern Ireland) 1985,
- The Wildlife (Northern Ireland) Order 1985 (as amended)

The Marine Act (Northern Ireland) 2013, establishes a strategic system of marine planning within the inshore region (out to 12 nautical miles) and helps to streamline the process of marine licensing. As part of this act is the creation of draft of our The Marine Plan for Northern Ireland 2013, which informs and guides the regulation, management, use and protection of our marine area, one for the inshore region and one for the offshore region (as a material consideration due to draft). This plan covers the inshore region from the Mean High Water Spring Tide mark out to, at most, 12 nautical miles and the small offshore region. The Marine Plan will be used for making decisions on activities in the marine environment. The Act enables the delivery of an ecologically coherent network of Marine Protected Areas, through giving DAERA the power, with the agreement of the Secretary of State, to designate MPAs, called Marine Conservation Zones (MCZ).

Marine Conservation Zones (MCZs) are designated protect a range of nationally important habitats and species such as cold-water coral reefs which thrive in the UK's deeper waters, sedimentary seabed habitats vital for a range of marine processes. MCZs fulfil the obligations of The Marine Act (Northern Ireland) 2013 to contribute to an ecologically coherent UK network of MPAs as well as wider biodiversity

commitments at North-East Atlantic and global level while fully taking into account any economic, cultural or social consequences of doing so.

The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009, is **t**he transposed, post Brexit legislation for managing flood risk from floods of all flood types (fluvial, pluvial, sea water, groundwater, artificial water bearing infrastructure. It has a particular focus on riverine and coastal floods. Coastal waters are assigned to these river basin districts as well as are groundwater bodies.

Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, is the transposed, post Brexit framework for the Community action in the field of water policy. The sets out the management of the 'water environment' including rivers, lakes, transitional waters, groundwater and coastal waters out to 1 nautical mile (12 nautical miles for chemical status, i.e., for territorial waters). Member States must aim to achieve good chemical and ecological status in identified water bodies by 2015. This includes transitional (estuarine) and coastal waters out to one nautical mile.

Under the Water (Northern Ireland) Order 1999, the discharge of trade or sewage waste to any waterway, or any water contained underground requires the consent of the Department of Agriculture, Environment and Rural Affairs. This includes waste from any commercial, industrial, or domestic premises not connected to the public sewer.

Special Areas of Conservation (SAC) are sites designated under the Habitats Directive for habitats of European Importance. SACs are designated for habitats and species listed under Annex I and II of the EC Habitats Directive, such as reefs and sandbanks. The Habitats Directive requires Member States to take measures that contribute to the conservation of biodiversity by maintaining or restoring certain habitats and species at a favourable conservation status. The Habitats Directive was transposed by The Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 and is required to identify and protect a series of Special Areas of Conservation (SACs). This has been transposed into NI legislation post Brexit through The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019.

Areas of Special Scientific Interest (ASSIs) are designated under The Environment (Northern Ireland) Order 2002 and contains powers for the protection of nationally important flora and fauna within Northern Ireland. Schedules of listed nationally important habitats and species include reference to coastal and marine features, including mudflats and common seals.

An Area of Outstanding Natural Beauty is designated under the Nature Conservation and Amenity Lands Order (Northern Ireland) 1985.

The Wildlife (Northern Ireland) Order 1985 (as amended), prohibits the intentionally killing, taking or injuring of certain species of wild birds and animals or the intentional destruction, uproot or picking of certain wild plants. Under the Wildlife (Northern Ireland) Order it is an offence to release into the wild non-native invasive species as listed in Schedule 9 Part II of the Order.

Republic of Ireland.

International Legislation.

International designations that are applicable to the management plan area include:

- OSPAR Convention 1992,
- Convention on Wetlands of international importance/Ramsar Convention,
- Marine Strategy framework directive 2008/56/EC,
- Marine Strategy Regulations 2010,
- The Floods Directive 2007/60/EC,
- Water Frame Works Directive 2000/60/EC,
- The EU Birds Directive 2009/147/EC, and
- The Habitats Directive (92/43/EEC).

Under the OSPAR Convention to Protect the Marine Environment of the Northeast Atlantic, Ireland and the UK are committed to establishing marine protected areas to protect biodiversity (i.e., OSPAR MPAs). The OSPAR Convention aims develop an ecologically coherent network of well-managed MPAs. OSPAR provides a mechanism through collaborative governance with EU and non-EU members to protect the marine environment of the North-East Atlantic. OSPAR includes a wide array of marine issues from work on pollution and dumping at sea to the conservation of marine biodiversity (OSPAR, 2016).

The Convention on Wetlands of Importance/Ramsar Convention is an intergovernmental treaty that provides the framework for national and international action for the conservation and appropriate use of wetlands for resources. Currently there are 147 contracting parties to the convention covering 1,524 wetland sites, a total of 129.2 million hectares (NPWS. More information on the Convention on

Wetlands of Importance/Ramsar Convention can be found here: https://www.ramsar.org/ (NPWS, 2022).

The Marine Strategy Frameworks Directive 2008 was introduced on the 17th of June 2008 by the European union in an active attempt to effectively protect the vast marine environment across Europe. A set of detailed criteria was commissioned to assist member states in implementing the Marine Strategy Framework Directive. The directive has encouraged a better understanding of current pressures and the impact of anthropogenic activities on the sea, their implications to marine biodiversity, habitats, and surrounding ecosystems. Knowledge from this initiative was one of the main drivers in developing the 'Single Use Plastics Directive' as well as increased levels of cooperation from member states within the four European sea regions (EC, 2021).

The Floods Directive (FD) 2007/60/EC is the European legislation for managing flood risk from floods of all flood types (fluvial, pluvial, sea water, groundwater, artificial water bearing infrastructure. It has a particular focus on riverine and coastal floods. Coastal waters are assigned to these river basin districts as well as are groundwater bodies.

The Water Framework Directive "Directive 2000/60/EC" of the European Parliament established a framework for the Community action in the field of water policy. The sets out the management of the 'water environment' including rivers, lakes, transitional waters, groundwater and coastal waters out to 1 nautical mile (12 nautical miles for chemical status, i.e., for territorial waters). Member States must aim to achieve good chemical and ecological status in identified water bodies by 2015. This includes transitional (estuarine) and coastal waters out to one nautical mile.

Special Areas of Conservation (SAC) are sites designated under the Habitats Directive for habitats of European Importance. SACs are designated for habitats and species listed under Annex I and II of the EC Habitats Directive, such as reefs and sandbanks. The Habitats Directive requires Member States to take measures that contribute to the conservation of biodiversity by maintaining or restoring certain habitats and species at a favourable conservation status. The Habitats Directive was transposed by The Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 and is required to identify and protect a series of Special Areas of Conservation (SACs).

National Legislation.

National designations that are applicable to the management plan include:

- Wildlife Act 1976 (Revised), and
- Foreshore Act 1933.

Wildlife Act 1976 (Revised).

The Wildlife Act 1976 (Revised) is the main piece of national legislation in the Republic of Ireland for providing protection to wildlife and control to some activities that may adversely affect wildlife and biodiversity. The act aims to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims.

Foreshore Act 1933.

The 1933 Foreshore Act identifies the RoI foreshore as the seabed below the high-water mark of medium tides, extending out to 12 nautical miles. The Foreshore Act requires that before the commencement of any works or activity (including the erection of any structures) on State-owned foreshore a licence or lease must be obtained. Marine and coastal developments in this area generally require consent an administered by the Foreshore Section of the DHLGH. Foreshore Activities relating to sea fisheries and aquaculture are administrated by DAFM. Dredging is regulated by Environmental Protection Agency, with the Department of Communications, Climate Action and the Environment regulates oil and gas related developments. Local authorities regulate planning functions immediately above the identified shoreline. All regulatory authorities have a legal obligation to ensure activities or operations that are likely to have a significant effect on the protected habitats and/or species in a Special Area of Conservation are subject to an Appropriate Assessment (NPWS, 2022).

Appendix 5: Infographic of new benthic habitats on windfarm foundations (SEER, 2022).