



The Irish Sea Network

Ecological Considerations for Marine Spatial Planning in the Irish Sea

Giving nature a voice in the marine spatial planning process

Partners:



Manx Wildlife Trust
Treisht Bea-Feie Vannin



Ymddiriedolaeth Natur Gogledd Cymru
North Wales Wildlife Trust



North West Wildlife Trusts



Scottish Wildlife Trust



Wildlife Trust of South & West Wales
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The Wildlife Trusts

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Background and context

The Irish Sea Network (ISN, see Appendix 1, p36 for list of acronyms) is a partnership of ten Wildlife Trusts¹ from around the Irish Sea, Northern Ireland Marine Task Force, Irish Wildlife Trust, and the Sustainable Water Network (SWAN), who have come together to improve our collective impact for nature.

Responding to the urgent need for greater cross-national collaboration and knowledge sharing, the ISN's aim is to improve understanding of marine conservation activities and pressures across the Irish Sea and to provide a forum for communication, co-operation and greater advocacy for better management of the Irish Sea. The ISN was formed in 2020 and is funded for five years thanks to the John Ellerman Foundation and Esmée Fairbairn Foundation.

In 2022 the ISN published a 'Review of the Irish Sea' (Irish Sea Network, 2022a). The report is the ISN's baseline assessment of the Irish Sea, to be used by decision-makers considering the management of marine activities in the region. This work formed the evidence base that informed the ISN's 'Vision and joint position statements'.

The Network's 2030 vision for the Irish Sea:

A healthy and resilient Irish Sea, enabled by collaborative, cross-national action; where marine wildlife and blue carbon habitats thrive, supporting multiple environmental, social and economic benefits.

The Irish Sea is an important regional sea, both ecologically and socio-economically. However, the marine environment is under significant and increasing pressure, with insufficient management measures to protect it (Irish Sea Network, 2022a). From minke whales to sea pens, the Irish Sea's marine and coastal ecosystems are incredibly diverse, supporting a huge variety of important wildlife. The rich and productive waters support a range of megafauna including the UK's largest semi-resident population of bottlenose dolphins, the elusive basking shark and rare angel sharks. The vast expanses of sandy and carbon-rich muddy sediments are home to key species of shellfish and marine invertebrates that are crucial components

of food webs and feed internationally important seabird populations. Coastal habitats such as rocky outcrops, biogenic reefs and kelp forests act as nursery grounds for fish and crustaceans which support the livelihoods of local coastal communities. Saltmarshes, mudflats and seagrass beds store vast amounts of carbon and can play an important role in defending coastal communities from flooding and coastal erosion. These highly biodiverse habitats also provide nursery grounds for commercially important fish. The connectivity of habitats and species in the Irish Sea (for example, Manx shearwater, cockles and sea bass (Irish Sea Network, 2022a), demonstrates how the Irish Sea cannot be considered as six individual parts but rather as one diverse interconnected system.

Our 'Review of the Irish Sea' (2022a) highlights the number and scale of activities taking place in the region including fishing and aquaculture, large-scale offshore wind development, a growing tidal energy sector, high levels of industrial and recreational maritime traffic, aggregate extraction, oil and gas extraction, military activity, and tourism and recreational activities (Figure 1). The mounting pressure and cumulative impacts from these activities, along with pollution, the impacts of climate change, and emerging technologies (e.g. exploration for carbon capture, usage and storage (CCUS) and nuclear waste disposal sites), are all having large and compounding impacts on the marine environment.

Looking to the future, the already busy Irish Sea is set to become even busier and the pressures that come with these activities will intensify. Governments of all six nations are rapidly expanding marine renewable energy developments as they race to meet net zero targets². In order to meet these targets, offshore wind capacity will need to more than quadruple across the UK and Republic of Ireland's waters by the end of the decade to reach a target of 57GW by 2030 (current capacity is 14GW) (Appendix 3, p37). The Isle of Man will also be progressing its first offshore wind farm to help achieve their goal of 100% renewable energy by 2030. Beyond 2030, the Climate Change Committee (2020) has predicted that, in the UK, a 14-fold increase from the current installed capacity of offshore wind will be required to meet net zero by 2050. A significant area of the Irish Sea will therefore be taken up by

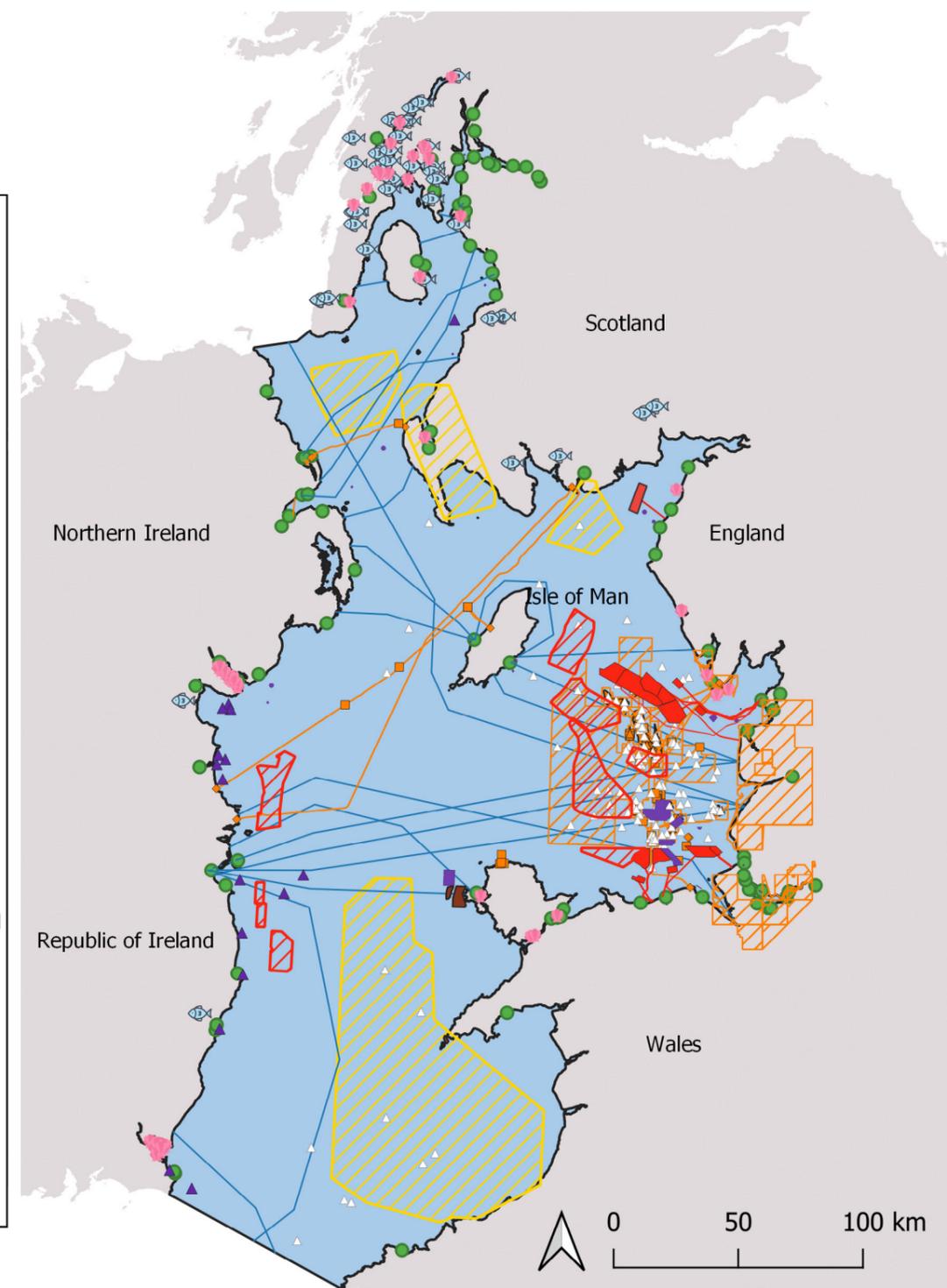
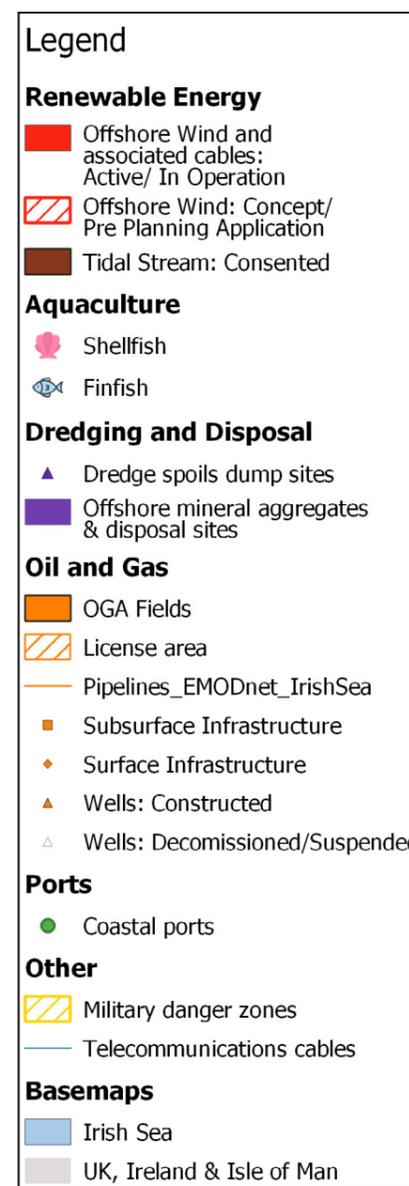


Figure 1: Activities occurring in the Irish Sea. See Appendix 2, p36 for data sources

1. Manx Wildlife Trust, North Wales Wildlife Trust, North West Wildlife Trusts (Cumbria, Lancashire and Cheshire), Royal Society of Wildlife Trusts, Scottish Wildlife Trust, Ulster Wildlife, Wildlife Trust of South and West Wales and Wildlife Trusts Wales.
 2. The UK, Isle of Man and the Republic of Ireland have committed to achieving Net Zero carbon emissions by 2050 and Scotland have committed to achieving it by 2045. Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, Climate Change Act (Northern Ireland) 2022, Climate Action and Low Carbon Development (Amendment) Bill 2021, Climate Change Act (Isle of Man) 2021, Environment (Wales) Act 2016 and the UK's Climate Change Act 2008.

See interactive marine planning maps for more detail: Marine Mapviewer | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk), The Wales Marine Planning Portal, Scotland's National Marine plan interactive (nmpi), marineplan.ie and Explore marine plans (marineservices.org.uk). No equivalent online map is available for the Isle of Man's marine activities. This map does not include all activities that take place in the Irish Sea. For maps showing levels of fishing and shipping see the Irish Sea Network 2022a.

these developments, expanding into new, larger geographical areas and deeper waters where the technology will need to move from fixed to floating turbines, the impacts of which are still uncertain. This ambition will result in an unprecedented scale of development in the marine environment resulting in the industrialisation of large parts of the Irish Sea.

We must ensure that whilst meeting net zero targets, other environmental commitments are not jeopardised. Offshore renewables must be delivered alongside environmental needs, not instead of them. Each nation has committed to protect and conserve the marine environment and ensure sustainable use of its resources. The Marine Strategy Framework Directive 2008/56/EC (MSFD) sets out how EU countries, including the Republic of Ireland (RoI), will “maintain healthy, productive and resilient marine ecosystems while securing a more sustainable use of marine resources”. The MSFD was written into UK law by the Marine Strategy Regulations (2010). This sets out how the UK will achieve the vision of “clean, healthy, safe, productive and biologically diverse oceans and seas”. The overall aim of the MSFD and UK Marine Strategy is to provide a framework for achieving Good Environmental Status (GES)³.

The Isle of Man sets out how it will manage the marine environment in its Marine Infrastructure Management Act (2016). While the Isle of Man is not signed up to the MSFD or Water Framework Directive, its Marine Monitoring Strategy is based on the UK’s with the aim of achieving GES. In 2023 the Isle of Man Government began a water monitoring programme to assess its progress against a number of GES descriptors. Currently, both the Republic of Ireland and the UK are failing to achieve GES in 6 out of 11 and 11 out of 15 indicators, respectively (DHPLG, 2020 and Defra, 2019).

Each nation has agreed to protect marine ecosystems through an ecologically coherent network of Marine Protected Areas (MPAs) and has made commitments to effectively conserve, manage and restore 30% of their marine and coastal ecosystems by 2030⁴ (CBD, 2022). Some countries have also made other commitments to marine protection for example, through designating Highly Protected Marine Areas (HPMAs) (Appendix 4, p38). The need for area-based management of the marine environment places demand for space in the Irish Sea. However, protecting and allowing marine ecosystems to recover is vital not only in its own right but because healthy, functioning marine ecosystems underpin all life on earth, including our own. Half the world’s oxygen comes from the

ocean and huge amounts of carbon are stored in marine habitats. MPAs that have effective management can allow degraded marine biodiversity to bounce back and can enhance the populations of commercially important species (Stewart et al., 2020). A healthy, thriving and functioning marine environment forms the fundamental basis of all social and economic activities in and around the Irish Sea.

In order to address the linked crises of climate change and biodiversity loss, it is crucial that we meet both net zero targets and marine ecosystem protection and recovery targets. One cannot happen at the expense of the other. As the Irish Sea becomes more industrialised, it is likely that the opportunity for marine ecosystems to thrive or recover will diminish and communities and businesses around the Irish Sea will feel the impact (Box 1). To prevent this from happening we need strategic, effective and aligned Marine Spatial Plans that prioritise nature’s recovery and achieving net zero.

As the Irish Sea Network, representatives for each of the six nations’ Wildlife Trusts and partner organisations have come together to agree our position on key issues in the Irish Sea and give nature a voice in the marine spatial planning process. We need policy makers and stakeholders to come together to create aligned plans that benefit all wildlife and communities around the Irish Sea. Many marine plans are currently being reviewed or developed which provides a unique time to influence marine planning. Due to the interconnections between marine ecosystems and the large-scale changes forecast, all six nations must work together to tackle the cross-boundary pressures that are impacting the Irish Sea.

The Irish Sea Network believes that strategic and effective regional marine spatial planning that takes an ecosystem-based approach⁵ with cross-national collaboration, would reduce the impact upon, and enhance, sensitive wildlife habitats and carbon stores, caused by multi-sectoral pressures.

Irish Sea Network (2022b)

3. Good Environmental Status is defined in Article 3 (5) of the MSFD as “the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations”.

4. All nations of the Irish Sea are signatories to the UN Convention on Biological Diversity (CBD) – the historic Kunming–Montreal Global Biodiversity Framework (GBF) was agreed at the 15th meeting of the Conference of Parties to the CBD. The GBF includes 23 global targets for 2030. Target 2 and 3 call for 30% of degraded marine and coastal ecosystems to be under effective restoration by 2030 and for 30% of marine and coastal ecosystems to be effectively managed and conserved by 2030. Read the full text [here](#).

5. The Convention on Biological Diversity defines the ecosystem-based approach (EBA) as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”.



Box 1. The future of the Irish Sea should business as usual continue

If there is no change in the way we manage the marine environment, it is likely the Irish Sea will become more industrialised and nature will be squeezed out. The rapid expansion of offshore developments and the desire to grow the blue economy means that more space will be allocated to marine industries leaving less space for nature to thrive. We will therefore fail to meet environmental objectives including net zero, GES and 30 by 30.

Traditional uses such as aggregate extraction and shipping will continue to grow. Oil and gas exploration will continue. Significant areas will be assigned to fixed and floating offshore wind farms with webs of cables covering the seabed. We will see expansion of new technologies such as hydrogen generation, Carbon Capture Usage and Storage (CCUS) and nuclear waste storage. The fishing industry as we know it will change dramatically as fishing becomes excluded from large areas of the sea due to offshore developments. Fisheries that are able to adapt will continue but less catch will be available as fish populations continue to decline and the competition for smaller fishing grounds puts high pressure on stocks. Aquaculture industries will expand and intensify.

Without safeguarding and restoring nature, marine ecosystems will continue to diminish, fish and shellfish populations will continue to fall and seabirds and marine megafauna will all continue to decline. On the coast, important habitats such as saltmarshes and seagrass beds will be squeezed out as sea levels rise and coastal development and artificial flood defences limit any adaptation. Development at sea and changes in environmental conditions will escalate the spread of

invasive non-native species which may further drive the loss of local wildlife. Blue carbon habitats are not protected from continued dredging, trawling and construction, disturbing the seabed and leading to degradation and loss of habitats. This turns carbon sinks into sources of carbon, further exacerbating climate change. Fragile and sensitive ecosystems will collapse as they are already stressed and have little resilience to new pressures such as rapidly changing climate conditions, disturbances from development and disease outbreaks (e.g. avian flu). Without stronger management and monitoring, priority marine habitats and species will continue to degrade and remain in unfavourable condition.

As blue spaces become more industrialised, coastal communities’ health and wellbeing will diminish as the spaces they use for recreation and their livelihoods become less safe and productive. Marine pollution will continue to prevent people from using beaches for activities such as swimming, surfing and snorkelling, threatening businesses dependent on recreation and tourism. Local wildlife tourism businesses will suffer as marine wildlife sightings fall. Large businesses grow as they take from natural resources but this growth is short-term and to the detriment of smaller-scale local businesses which will be unable to continue as degraded seas and significant competition mean they are unable to make a profit. This will negatively impact people’s health and wellbeing, as their businesses fail. The increase in activity in the sea will lead to increased conflicts between other sea users and with the marine environment.

But with spatial prioritisation, where nature is prioritised the picture is very different (see Box 2, p14).

Do we have enough sea space to deliver ambitious targets?

All Irish Sea nations have responded to the joint nature and climate crises by committing to protect and restore at least 30% of our seas by 2030 and achieving net zero by 2050. However, with all of the large-scale developments and numerous activities in the Irish Sea (Figure 1, p5), there is little room left for nature to recover.

While the multi-dimensional nature of the marine environment allows for activities to coexist, Figure 2 represents a simplified visualisation of how much space is currently being used by major human activities⁶ in the Irish Sea, leaving little room for expansion.

Without clarity on the priorities as to how we use the marine environment, there will be an increased risk of conflict between sea users and the marine environment, and conflict between users themselves, whether recreational or industrial stakeholders, as well as the continued degradation of marine ecosystems with negative impacts on the livelihoods and health and wellbeing of coastal communities (Box 1, p7). While it may be a difficult and sensitive task to prioritise activities in the Irish Sea it must be done urgently, with tackling the climate and nature crises at the heart of the decision-making process.

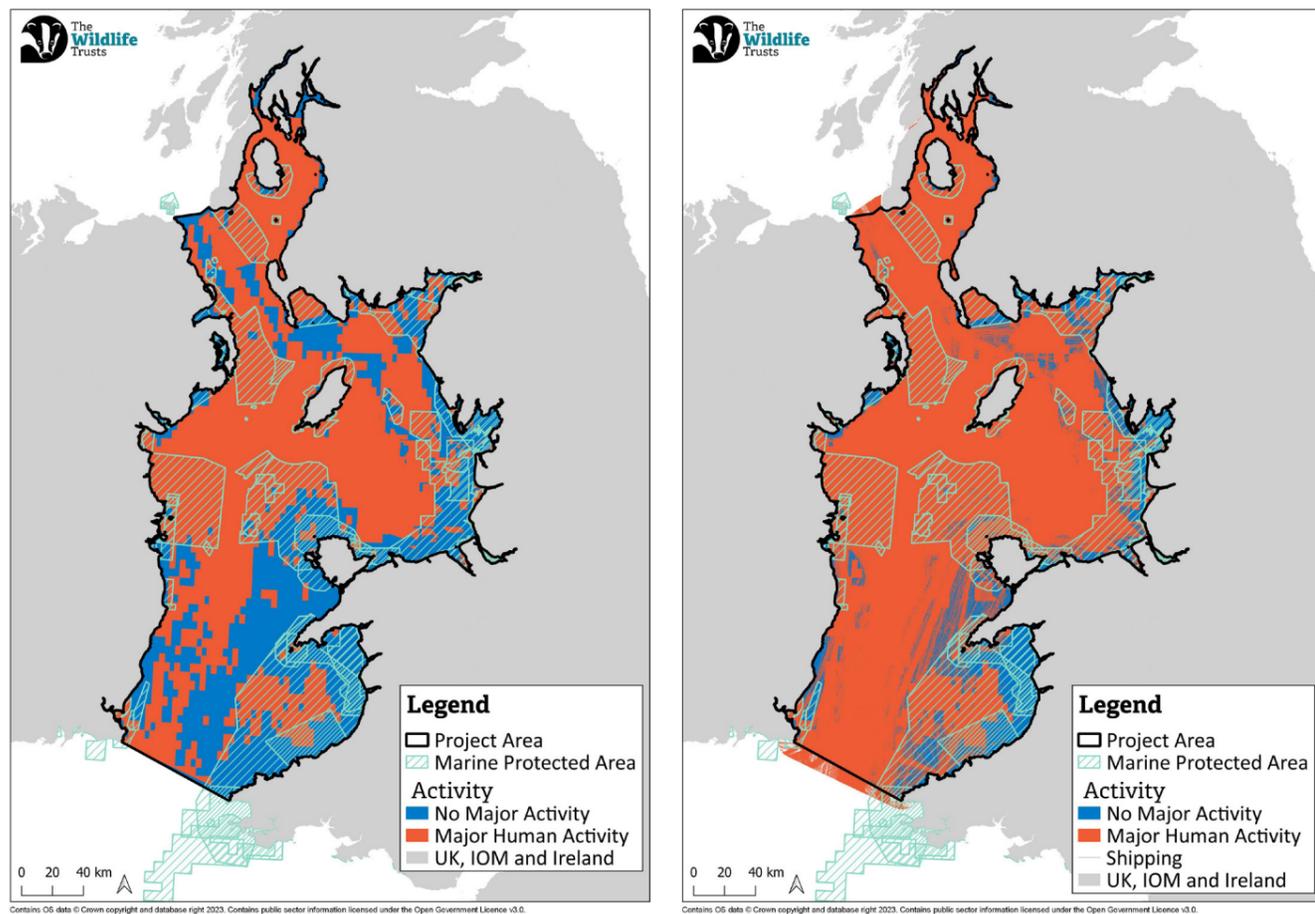
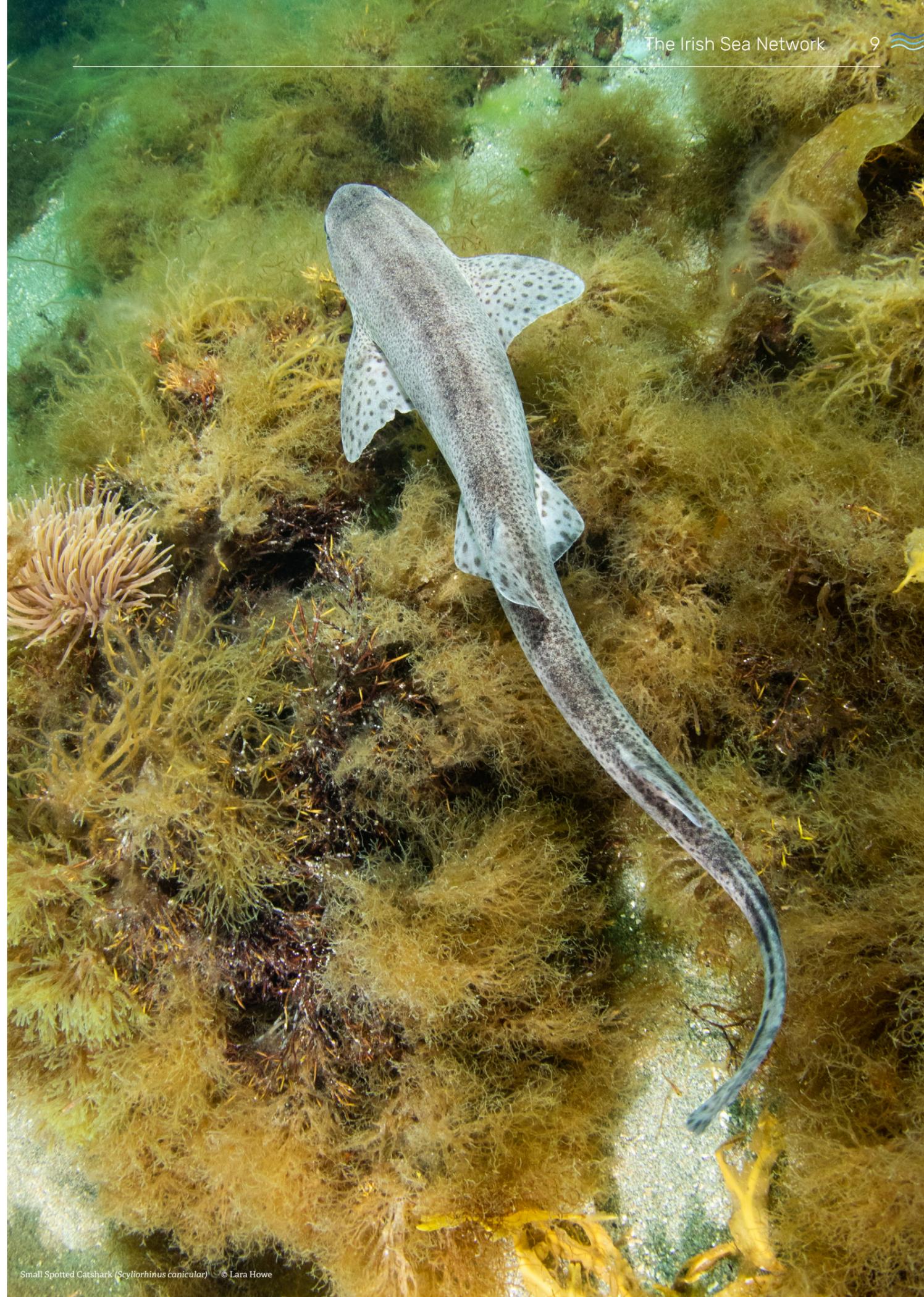


Figure 2: Major human activities (red) and designated site boundaries (hashed polygons) in the Irish Sea (a - left) excluding shipping and (b - right) including shipping. See Appendix 2, p36 for data sources

6. Major human activities include aggregates, aquaculture, dredging, fishing, military, pipelines, offshore renewable energy and oil and gas infrastructure and licenses.



Small Spotted Catshark (*Scyliorhinus canicular*) © Lara Howe

The change we want to see:

All nations around the Irish Sea must work together to implement Marine Spatial Prioritisation (MSPri) that has nature's recovery and achieving net zero at its core. Plans must be strategic, effective and aligned, taking into account the cumulative impacts of activities on an Irish Sea scale.

The Irish Sea Network recommends that the next Marine Spatial Plans in the Irish Sea must:

1. **Ensure transboundary collaboration** during the marine planning process to align plans across the Irish Sea and ensure all six nations are working towards the same goals of nature recovery and achieving net zero.
2. **Prioritise nature**, ensuring that it is a golden thread throughout; without this the sustainability of all other marine activities will be compromised.
3. **Make plans spatially explicit**. Develop a process to prioritise and strategically plan what activities can occur in what location. This can be achieved by calculating the current and projected demands on the Irish Sea, calculating the Irish Sea's carrying capacity and conducting sensitivity mapping and scenario planning.
4. **Contain a plan for nature's recovery** in order to achieve 30 by 30. For MPAs to count towards 30 by 30, they must have plans to strengthen and implement management measures and plans to monitor and enforce these measures. There must be recognition of the need for stricter marine protection across whole sites and areas set aside for habitat restoration.
5. **Prioritise achieving net zero** in tandem with nature's recovery. This can be achieved through plans to reduce energy consumption and improve energy efficiency, developing sustainable marine renewable energy in the right location, at the right scale and with the right technology and implementing nature-based solutions.
6. **Consider climate change scenarios** and build long term resilience of marine ecosystems and marine activities.
7. **Include a plan for achieving a just transition** for sea users and coastal communities and include them at all stages of the planning process.



1. Ensuring transboundary collaboration

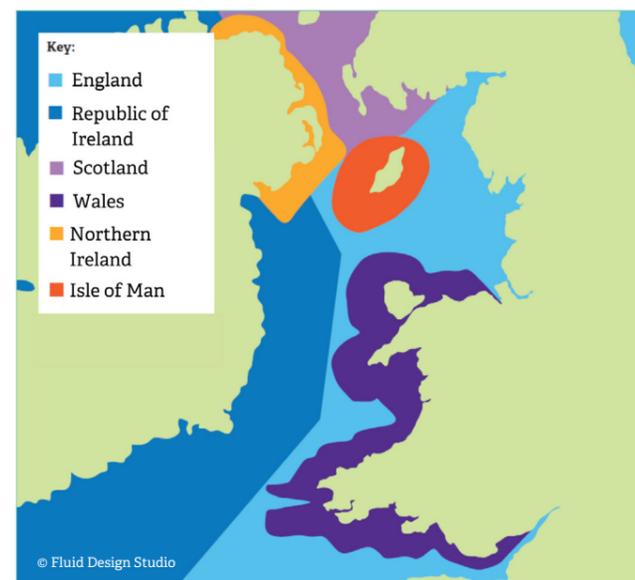
There is no regional marine spatial plan for the Irish Sea, but rather six different plans at different stages of the marine planning process (Appendix 6, p40).

Although there are some key similarities in their objectives and priorities, each plan differs in its approach and there is limited alignment of plans across the Irish Sea (Appendix 7, p41). Working across borders is complex, particularly due to the different priorities of each nation and multiple different legal frameworks, policies and legislations. However, as wildlife does not adhere to borders, the Irish Sea's marine environment is interconnected (See case studies 1, 2 and 3, Irish Sea Network, 2022a), and therefore cannot be managed without considering the entire range of species and habitats, which may extend outside of current marine plan boundaries. Moreover, many of the activities and pressures⁷ act on a large, cross-border scale and have cumulative impacts, not limited to the marine plan boundary. The pace and scale of change from emerging pressures coupled with climate change, is going to have significant and devastating impacts on marine species, habitats and blue carbon if not managed effectively. Therefore, we must take action at an Irish Sea scale.

All plans reference transboundary cooperation, but mostly with neighbouring administrations rather than on an Irish Sea scale, and without a strategic plan in place to harmonise marine plans between countries⁸. It is therefore unclear what the statements and policies mean in practice.

Recommendation: Ensure transboundary collaboration during the marine planning process to align plans across the Irish Sea and ensure all six nations are working towards the same goals of nature recovery and achieving net zero.

- A regional approach to Marine Spatial Planning that puts nature and climate at the heart of decision making is key to managing the Irish Sea sustainably. We need all nations of the Irish Sea to come together to create spatially explicit, ecosystem-based Marine Spatial Plans that prioritise nature's recovery and achieving net zero.
- Due to the complexity and the connectivity of ecosystems, marine planners from all nations need to work together to avoid adverse effects from one area undermining management in another.
- There needs to be coherence between plans through international cooperation and consultation. Transboundary issues should be tackled through multidisciplinary collaboration between governments, industry, researchers and NGOs, and cross border partnerships (case study 1).



Division of Marine Spatial Planning responsibilities in the Irish Sea (adapted from Kidd, 2023).



Case Study 1. Our Dee Estuary

The River Dee Basin District spans 2,251 square kilometers, primarily in Wales with a smaller area in England. Originating in Snowdonia National Park, it flows to the Dee Estuary, an internationally significant intertidal and wading bird habitat. The Dee supplies drinking water to nearly three million people in Wales and North West England, necessitating rigorous pollution protection measures.

The Tidal Dee Catchment Partnership, which spans England and Wales, was formed in 2013 to facilitate local collaboration between stakeholders, and to identify priority actions for the water environment, in line with the catchment-based approach. Recognising that issues facing the catchment were similar in both countries, the Catchment Partnership initiated a cross-border partnership project; Our Dee Estuary / Caru Aber Dyfrdwy, began in 2018 with funding from the National Lottery Heritage Fund, it aims to address threats to the Dee Estuary to create a new sense of stewardship to protect it.

The project, led by Cheshire Wildlife Trust, seeks to connect the coastal communities of the Wirral, Flintshire and Denbighshire to the spectacular and often unique natural heritage of the Dee Estuary.

Our Dee Estuary aims to make the estuary integral to people's lives, improve natural heritage management, raise awareness of habitats and species, and empower communities to reduce environmental impacts through training and lifelong learning.

The project has proven to be successful with communities from all walks of life taking part along the estuary. From citizen scientists taking ownership of monitoring the quality of water entering the estuary and locating problem sources, to community led mental health support groups getting involved in surveying for invasive species and using practical methods to improve sand dune habitats. The bottom-up approach to fostering positive change within the catchment has inspired and empowered people to take an active role and become the drivers for the project.

Following the success of this catchment-based work the project has taken forward the approach to the coast in order to establish a coastal-based partnership to tackle coastal issues. Work is currently being undertaken to develop and structure a formal coastal partnership in the tidal Dee Estuary.

7. Such as climate change, shipping, pollution, cables and large-scale development.

8. For example, Republic of Ireland's marine plan states that parties must "show evidence of consultation with the relevant public authorities, including terrestrial planning authorities and other country authorities" however, there is no strategic plan in place to harmonise marine plans between countries that share the Irish Sea.

2. Prioritising nature

Current marine plans all consider growing sustainable marine industries and the blue economy as a key priority, often mentioned ahead of environmental objectives. Some plans reference the need to balance the social, economic and environmental benefits, giving them equal importance.

Marine plans have dedicated sections for environmental objectives and policies to meet these, but for some, it is not clear that achieving social and economic objectives will only be possible if the environmental objectives are met and that nature should be considered when carrying out any activity in the marine environment.

Recommendation: Prioritise nature, ensuring that it is a golden thread throughout; without this the sustainability of all other marine activities will be compromised.

- Nature must be prioritised and the golden thread throughout the entire marine plan. It should be considered at all stages of the planning process, not just in an individual section on the environment. Prioritising actions that promote the protection and recovery of marine ecosystems will positively benefit marine industries and improve the wellbeing of local communities, for example by increasing fish stocks, protecting coasts from flooding and erosion and attracting tourism (Box 2).
- Nature must be recognised as the fundamental basis of all social and economic development and it should be made clear that all other marine activities rely on a healthy and thriving marine environment.
- Scotland's marine plan states that it "puts the marine environment at the heart of the planning process to promote ecosystem health, resilience to human induced change and the ability to support sustainable development and use". Similarly, Ireland's marine plan explains the importance of healthy marine ecosystems for each sector, while making the point that marine life has intrinsic value beyond any value realised by humans. This messaging should be reflected in all Irish Sea marine plans, not only through their visions but also evident in their policies and action plans.



Box 2. The future of the Irish Sea if marine plans prioritise nature

If Marine Spatial Planning prioritises nature's recovery and achieving net zero we should see recovery of the Irish Sea. We will have a clean, safe, healthy and productive sea where ecosystems are diverse and functioning, benefitting society and the economy. Collaboration among all nations bordering the Irish Sea will be fundamental to this process and will lead to an ecologically coherent Marine Protected Area (MPA) Network. Each nation's 30 by 30 plans will include good representation of the Irish Sea and when taken collectively at least 30% of the Irish Sea will be under active management. Every designated site will be effectively managed as a whole site and the stricter protection will result in ecosystem wide recovery of ecological processes and ecosystem functions, enhanced marine biodiversity, safeguarded blue carbon stores and increased fish and shellfish populations which spill over into surrounding areas. Rigorous monitoring of MPAs and our wider seas, will result in a better understanding of the marine environment and how it responds to human activities, climate change and management, informing adaptable marine plans. Marine and coastal habitats will be in recovery through pressure reduction and active restoration and we will benefit from the associated ecosystem services these habitats provide. Climate change will still drive changes to the marine environment (e.g. through sea level rise and increased frequency of extreme weather events) but this will be accounted for in plans and both social and ecological resilience will be built in (Sala and Giakoumi, 2017).

We will sustainably use sea resources, with space clearly defined for marine activities, including harmonious coexistence. Comprehensive cumulative impact assessments will ensure activities do not exceed the Irish Sea's carrying capacity. Clear spatial prioritisation will provide clarity for people working in the marine sector of what they can and cannot do within and outside of MPA boundaries and how to operate within environmental limits while having an overall benefit to marine biodiversity. This will make it easier for marine industries to develop in the right places, ultimately streamlining consent processes and reducing opposition. For example, strategic planning of offshore wind farm infrastructure, including cable corridors, that follow the mitigation hierarchy, will result in arrays being built outside of MPAs and marine biodiversity net gain of each project. Net zero will be achieved through a diverse mix of solutions. Reduced energy consumption means the demand for renewable energy development will not exceed the sea's capacity. Sea users will be supported during the transition to a new energy system and alternative sustainable livelihoods. Nature-based solutions will be included as part of the solution. Blue carbon habitats will play a significant role in sequestering and storing carbon thanks to pressure reduction and restoration activities with involvement from local communities. Greater protection and enhancement of coastal habitats will reduce the impacts from flooding and coastal erosion, easing the anxiety of coastal communities.

Stricter management and ecosystem recovery will result in more productive fisheries, as fish and shellfish biomass and abundance will increase and catch will be larger and greater in age, bringing higher income. Sustainable fishing practices will be rewarded, and consumers will demand sustainably caught seafood. Fishers will diversify their income by offering tourism and recreation services. The positive framing of this transition for physical and mental wellbeing and greater income will mean that the previous narrative of people feeling devalued when transitioning into service work is challenged (Winchenbach, et al., 2022).

Access to a thriving marine environment means that all people around the Irish Sea will reap the benefits of blue spaces, experiencing a boost in mental and physical wellbeing. Local coastal economies will thrive, benefiting from the increase in recreation and sustainable tourism. People will become reconnected with the natural world and engaging in activities like rock pooling, snorkelling, and citizen science will boost local residents' confidence, skills, and knowledge. This will foster stronger communities, with a sense of "pride in place" and community cohesion, which reduces loneliness, mental health illnesses and eco-anxiety. Engagement of local communities in marine conservation activities will help to address the issues of shifting baseline syndrome and improved ocean literacy and there will be a stronger understanding and appreciation of the Irish Sea.

3. Plans are fit for purpose and spatially explicit

Planning processes and the current format of plans are limited in their ability to support the achievement of GES, net zero and nature's recovery.

Firstly, plans lack spatial solutions and instead are more strategic in nature, often repeating policies such as the MSFD and UK Marine Strategy and ecosystem-based approach, without including clear spatial guidance or detailed action on how each GES descriptor target or policy will be reached or has been implemented. Plans do not demonstrate the current, planned or projected volume, intensity or location of activities, which is required in order to understand and assess the cumulative impacts to the environment and the carrying capacity of the Irish Sea (i.e. the maximum amount of activities the region can sustain without environmental degradation). Without this assessment, plans cannot take an ecosystem-based approach and will be less effective in progressing GES targets and nature's recovery. Moreover, sensitivity mapping is an essential step in applying the ecosystem-based approach however, there is no evidence that this has been carried out in any of the current marine plans for the Irish Sea.

The vast and growing number of activities in the Irish Sea and the need to expand renewable energy developments will result in spatial conflicts from direct competition over limited space or one sector negatively impacting the other. While many activities can coexist, others are incompatible and have conflicting objectives, for example, cabling for offshore wind is not compatible with some fishing activities. Current spatial plans do not prioritise activities or provide guidance on which activities can coexist, or not. Irish Sea spatial plans lack regional compatibility matrices which demonstrate the levels of conflict and consequent requirements for spatial management.

Recommendation: Make plans spatially explicit. Develop a process to prioritise and strategically plan what activities can occur in what location. This can be achieved by calculating the current and projected demands on the Irish Sea, calculating the Irish Sea's carrying capacity and conducting sensitivity mapping and scenario planning.

- We need marine spatial prioritisation (MSPri) that establishes a clear hierarchy for the use of the Irish Sea that is compatible with nature's recovery and achieving net zero.
- As part of the MSPri process, significant mapping needs to take place to enable Marine Spatial Plans to be used to provide spatial solutions to managing human activities in line with achieving environmental targets. To inform this process, the following needs to be mapped and calculated:
 - The current and projected demands on the Irish Sea and the carrying capacity of the marine environment at an Irish Sea scale to see if these are compatible.
 - Cumulative impact assessments to estimate the overall impacts of all activities to the marine environment, this will inform whether current and planned activities will exceed the marine environment's carrying capacity. Assessments should include activities from the whole Irish Sea region and consider impacts on all levels (i.e. direct/indirect, short/long-term, permanent/temporary and positive/negative). The multi-dimensional and dynamic nature of the marine environment⁹ must also be considered.
 - Scenario planning that considers climate change and cumulative impacts of all activities in the Irish Sea region for the short- (by 2030), medium- (2050) and long-term to inform the future location of activities (For example the Marine Climate Change Impacts Partnership (MCCIP, 2023) report on the most up to date scientific understanding of climate change impacts on UK coasts and seas and give guidance on adaptation advice based on low-high confidence climate change scenarios).
 - Develop a compatibility matrix for human activities to understand what activities can and cannot coexist.
 - Make use of sensitivity matrices¹⁰ for important ecosystem components and human activities, in an Irish Sea context.
- Sensitivity mapping that considers climate change and cumulative impacts of all activities in the Irish Sea region. All ecologically important areas (See list in Appendix 5, p39) should be identified in the marine plan and mapped spatially using the best available data. Combining this with data on the sensitivity of species and habitats to pressures will highlight areas that are likely to be most vulnerable to human activities and climate change, this can be used to inform which areas are most suitable for activities to occur in and areas to avoid development. These maps can then also be used to prioritise areas for nature's protection and recovery, strengthening the ecological coherence of the MPA network, and ecological connectivity outside of protected areas (case study 2, p18).
- Identify data and knowledge gaps and create an action plan to fill them. There are currently large data and knowledge gaps due to a severe lack of marine monitoring. Governments must back these action plans with the necessary funding for nature conservation bodies. In the meantime, the precautionary approach should be taken (Kriebel et al., 2001).
- Marine plans should go beyond the land-sea interface by integrating land-use plans (such as the Local Nature Recovery Strategies in England). This will enable MPAs and other effective area-based conservation measures (OECMs) to be integrated into wider landscapes and seascapes. Activities on land have an impact on the coastal and marine environment (e.g. agricultural run-off and coastal developments), and vice versa (e.g. offshore wind cabling landing onshore to converter stations). It is therefore important that marine plans consider the aims of land-use plans and that cumulative impact assessments include pressures from land activities.
- Identify areas where activities can be co-located. Industries should explore innovations to enable co-location.



9. Biodiversity, environmental conditions and human activities can vary substantially with height above sea level and depth. Both vertical and horizontal spatial prioritisation is required (Venegas-Li et al., 2017).

10. Tools currently available include FEAST Feature, Activity, Sensitivity Tool, MOAT Marine Online Assessment Tool, or the Advice on Operations that form part of Natural England's conservation advice packages for MPAs.



Common Lobster (*Homarus gammarus*) © Aoibheann Gillespie-Mules



Common Starfish (*Asterias rubens*) © Aoibheann Gillespie-Mules



Fireworks Anemone (*Pachycerianthus multiplicatus*) © Aoibheann Gillespie-Mules

Case Study 2. Spatial analysis- Ireland's Areas of Interest

Fair seas (2022) conducted a spatial analysis of existing ecological data to inform the selection of sites where marine habitats and species in the Republic of Ireland should be conserved or restored. The study identified 16 Areas of Interest (AOIs) for potential Marine Protected Area designation.

AOIs were developed by conducting spatial analyses of species of conservation interest. Five species groups were considered in this study: (1) cetaceans (marine mammals in the order Cetacea, e.g. whales and dolphins); (2) seabirds; (3) elasmobranchs (sharks, skates and rays and chimaeras); (4) commercially exploited species; and (5) seabed features. Different analyses were conducted for species groups depending on available data. Survey data for cetaceans, seabirds and elasmobranchs were used to identify areas with high population density and species richness in the Irish Maritime Area.

For seabed features, occurrence maps of particularly sensitive organisms and habitats were created; for commercially exploited species, existing locations of spawning grounds were considered as evidence that an area is of high importance for the species in question. Additionally, for seabirds, a scoring system was developed to identify potential hotspots, taking account of the species' conservation status and age of the recorded sighting.

Fair Seas hope that this work will accelerate the Irish government's efforts to designate an MPA network in Irish waters. The identification of AOIs is a first step to instigate actions and discussions between stakeholders that will ultimately lead to achieving 30 by 30.

4. Planning for nature's recovery

Current MPAs are failing to protect the marine environment and spatial plans have not been used to address how the MPA network will be strengthened.

With only 5% of MPAs in the Irish Sea having fisheries management measures in place (Figure 3, p21), no management plans for two thirds of designations, and many MPA features in unfavourable conditions, it is evident that current management across the network is not effective and we will therefore continue to fail Environment Act (2021) targets in the UK, obligations under the EU Birds and Habitat Directive in the Republic of Ireland, 30 by 30 targets and GES (Irish Sea Network, 2022a; Schere, 2020). While management of MPAs across the Irish Sea as a whole is minimal, the picture for the Isle of Man is more positive (case study 3, p22). Damaging activities¹¹ are continuing to take place inside many MPAs in the Irish Sea, preventing the recovery of marine ecosystems and their ability to reach favourable condition (Natural England, 2023).

Furthermore, the majority of the Irish Sea's MPAs take a feature-based approach which is comparable to protecting individual trees rather than a whole woodland as management only covers a small proportion of an MPA. In addition, current management is based on maintaining the current, often degraded state of these features, suffering from shifting baseline syndrome¹². This feature-based approach does not allow ecosystem wide recovery of ecological processes and ecosystem functions. Evidence shows that fully protecting whole sites is the most effective approach to marine conservation to reach environmental, economic and social targets (Turnbull et al., 2021). Currently, in the Irish Sea, only Allonby Bay HPMAs (England) and Lamlash Bay No Take Zone (Scotland) take this approach.

All six nations of the Irish Sea support 30 by 30 targets however, the majority of the Irish Sea's MPAs do not actually offer sufficient protection to be included in 30 by 30 calculations. We cannot achieve 30 by 30 through the current MPA network unless we expand protection measures to cover whole sites.

Furthermore, very few MPAs are adequately monitored, meaning we do not know the condition of the marine ecosystem or how this has changed since designation. There is also no effective monitoring of activities inside MPA boundaries. We cannot achieve 30 by 30 if we do not better understand what is happening within MPAs.

Recommendation: Contain a plan for nature's recovery in order to achieve 30 by 30. For MPAs to count towards 30 by 30, they must have plans to strengthen and implement management measures and plans to monitor and enforce these measures. There must be recognition of the need for stricter marine protection across whole sites and areas set aside for habitat restoration.

- Achieve 30 by 30 in all nations bordering the Irish Sea.
 - o The Irish Sea Network believes that a minimum of 30% of each nation's waters should be effectively designated and managed for nature's recovery by 2030 including areas with stricter protections¹³. Actions taken within territorial seas should ensure there is an ecologically coherent network, with sufficient coverage of the Irish Sea (Box 3). This target cannot be met by the process of designation alone. Effective condition monitoring and management plans must be implemented as a matter of urgency in order to inform progress against the target.
- An MPA recovery plan should be included in marine plans.
 - o We must strengthen our current MPA network by implementing effective management to remove all damaging activities from MPA boundaries.
 - o To achieve 30 by 30 and nature recovery targets, we need a whole site approach to MPA management and sites must be fully protected from damaging activities. Management must go beyond maintaining a feature's condition to recovering whole ecosystems within a site. MPAs must also be well-connected with nature corridors allowing the movement of mobile species safely between sites and the movement of species as they adapt to change.

11. For example, development of offshore renewable energy infrastructure, sewage discharges and fishing with bottom-towed gears.
 12. Shifting baseline syndrome (SBS) describes a gradual change in the accepted norms for the condition of the natural environment due to lack of past information or lack of experience, memory and/or knowledge of past conditions. Consequences of SBS include an increased tolerance for progressive environmental degradation, changes in people's expectations as to what is a desirable state of the natural environment, and the establishment and use of inappropriate baselines for nature conservation, restoration, and management (Soga and Gaston, 2018).
 13. Strictly protected MPAs prohibit all extractive and industrial activities within their entire boundaries. HPMAs in England fit this criteria.

- MPAs must have robust condition monitoring plans in place to assess their contribution towards meeting 30 by 30 targets (WWF and IUCN WCPA, 2023).
- Marine plans must recognise the importance of designations with stricter protections across the whole site (for example, HPMA in English waters).
 - o While we need to urgently prioritise improving protections within current MPAs, it must be recognised that in some areas, all extractive, destructive and depositional uses should be prohibited. Fully protecting sites and removing all damaging activities is the best way to safeguard marine ecosystems giving them the greatest chance of recovery (case study 4, p24).
- Allocate nature recovery areas with plans in place to restore marine and coastal habitats.
 - o Marine Spatial Plans need to include restoration activity policies to identify and map ecosystem restoration opportunities, allocate space for restoration and act as a mechanism to promote proactive restoration of marine ecosystems (not just restoration for mitigation purposes).
 - o For many marine habitats, the only way to achieve restoration is to remove pressures; this is only possible through stricter management and strategic planning that prioritises the recovery of the marine environment. However, for some coastal species, restoration is possible through active intervention (case study 5, p25).

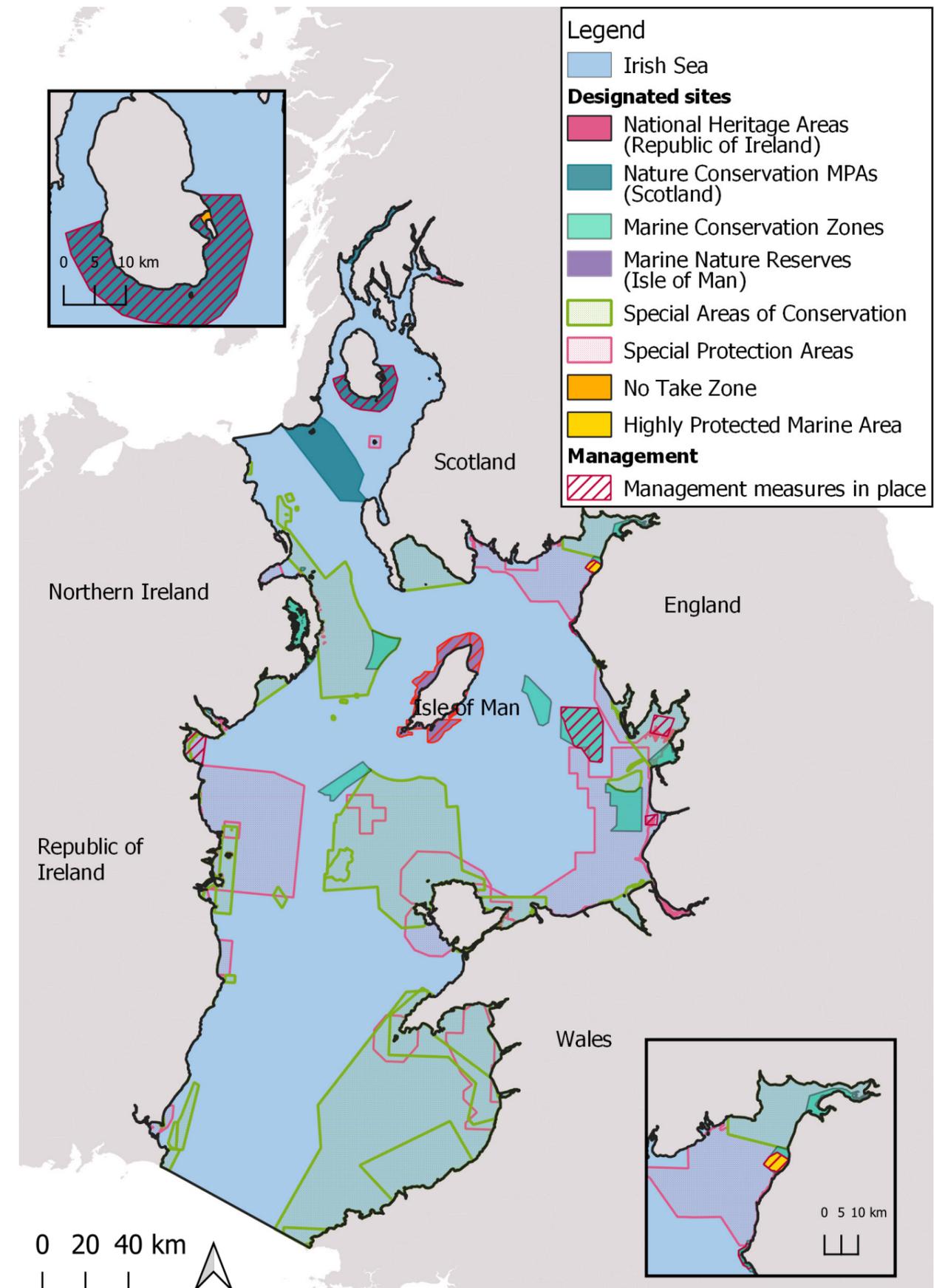


Figure 3: Marine Protected Areas in the Irish Sea and areas with management measures in place (red hashed polygons) Data from JNCC, Natural England, Scottish Natural Heritage, DAERA, Natural Resource Wales, North Western IFCA. The Irish Sea region boundary (blue).



King Scallop (*Pecten maximus*) © Lara Howe

Case Study 3. The Isle of Man's Marine Nature Reserves

The Isle of Man has a long history of closed and/or restricted areas to mobile fishing gear since the 1980s and more recently with the designation of ten Marine Nature Reserves (MNRs). Initially there was some resistance to these closures but over time the industry has seen the benefits, such as over-spill and restocking by larvae to other areas.

This has particularly been seen with the development of Ramsey Bay MNR, historically a productive area with good populations of scallops. However, there were no restrictions and it was over fished. So, in December 2009, an emergency closure was put in place with the aim of recovering the fishery.

Over the next few years there was a lengthy public and industry engagement process which resulted in a formal consultation to create the first Manx MNR that was to benefit the marine environment and the scallop fishery.

Ramsey Bay MNR was designated in 2011 with five zones: four focused on marine conservation and one zone as a fisheries management zone, where scallops could be harvested in a sustainable way maintaining the ecological integrity of the Bay. Surveys began in 2012, initially by DEFA but later by industry and showed that scallop numbers were increasing both in size and abundance.

The added benefit of the MNR to the fishing industry is that the value for this product has increased and the travel time/time at sea to reach their quota is reduced, reducing their carbon footprint and reducing the physical footprint on the seabed. Since then, an additional nine MNRs were created in 2018, under the Wildlife Act 1990, with the support of the industry, covering just over 50% of the Island's 0-3nm.

Box 3. 30 by 30 in the Irish Sea

All nations have committed to ensuring that 30% of coastal and marine ecosystems will be effectively conserved and managed by 2030 through the Kunming-Montreal Global Biodiversity Framework (GBF) which was agreed at the 15th meeting of the Conference of Parties to the UN Convention on Biological Diversity (CBD, 2022).

The text of GBF Target 3 is as follows: *“Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities including over their traditional territories.”*

30 by 30 is a huge and incredibly ambitious target; careful planning will be critical to implementing it within the tight time frame of 2030 (WWF and IUCN WCPA, 2023). In order to reach 30 by 30, all the elements included in Target 3 should be achieved, not just the percentage element. Marine Protected Areas and other area based conservation measures must therefore take a whole site approach and be fully protected from damaging activities.

Whilst this target is a profoundly important step forward in recognising the scale of change that is needed, attention must be given to how the targets are implemented to avoid perverse effects. For example, in areas with multiple jurisdictions like the Irish Sea, theoretically, individual nations could make unilateral decisions that undermine the overall effectiveness of the Irish Sea region i.e. each nation could protect 30% of their seas outside of the Irish Sea region leaving little or no protection for the Irish Sea. To achieve the greatest benefits, actions to achieve 30 by 30 in each nation's territorial seas should therefore ensure there is an ecologically coherent network of effectively protected marine areas across the Irish Sea. This will require cooperative working with neighbouring nations.



Basking Shark (*Cetorhinus maximus*) © Alexander Mustard/2020VISION

Case Study 4. Highly Protected Marine Areas in the Irish Sea

HPMAs in England:

The first three Highly Protected Marine Areas (HPMAs) in England were designated in July 2023. Allonby Bay, located in the Irish Sea off Cumbria, is the only inshore HPMA to be designated. This site is important for its diverse mix of habitats from carbon and nutrient-rich mud, living reefs made up of blue mussels and honeycomb worms, rare peat and clay exposures, sandflats and rocky outcrops.

The site also contains key spawning and nursery areas for fish, including cod, bass, plaice and sole, and thornback ray. These habitats and fish support a vast array of shorebirds and seabirds such as guillemots and razorbills. No extractive, destructive or depositional activities can take place within the HPMA. This will give the marine ecosystem the best chance of recovery.

Unlike other MPAs, HPMAs in England protect everything within their boundaries. The protected feature of the Allonby Bay HPMA is the marine ecosystem of the area. *“The marine ecosystem”* is defined as *“all marine flora and fauna, all marine habitats and all geological or geomorphological interests, including all abiotic elements and all supporting ecosystem functions and processes, in or on the seabed, water column and the surface of the sea”*. The conservation objective is to *“achieve full recovery of the protected feature, including its structure and functions, its qualities and the composition of its characteristic biological communities present within the Allonby Bay HPMA, to a natural state, and prevent further degradation and damage to the protected feature, subject to natural change”* (The Allonby Bay Highly Protected Marine Area (Marine Conservation Zone) Designation Order 2023).

The designation of the first three HPMAs in England is a great first step, but these sites cover just 0.4% of English seas. We need more HPMAs to recover our seas if we are to meet 30 by 30 targets, GES and sustain key marine industries.

HPMAs in Scotland:

The Scottish Government published the Bute House Agreement in 2021 which included a commitment to *“add to the existing MPA network by designating a world-leading suite of Highly Protected Marine Areas (HPMAs) covering at least 10% of our seas”*. A consultation was held in 2023 which set out the proposed policy framework for designating HPMAs in Scottish waters by 2026.

In June 2023 it was announced in a statement by the Cabinet Secretary for Transport, Net Zero and Just Transition that *“the proposal, as consulted on, would not be taken forward”* based on an initial analysis of consultation responses and feedback from stakeholders. In the statement the Cabinet Secretary committed to *“developing a new pathway and timetable for enhancing marine protection”* with renewed focus on community-led conservation initiatives and further engagement with local communities on taking forward enhanced marine protection in Scotland.

Further details on this work are yet to be published. While the news was disappointing it does highlight how crucial it is that governments work with local stakeholders as early in the process as possible.



Honeycomb Worm (*Sabellaria alveolata*) reef at Allonby Bay © Cumbria Wildlife Trust



Native oyster restoration at Glenarm Marina © Ulster Wildlife

Case Study 5. Native Oyster Restoration in Northern Ireland

In 2018, JNCC carried out an assessment of the ecological connectivity of the MPA Network in Northern Ireland and identified the native oyster as being a missing feature within the network (JNCC, 2018).

Native oysters are a priority species for the UK and Northern Ireland because of their decline, rarity, and the important ecosystem services they provide. Oysters are remarkable filter feeders, with a single oyster capable of filtering around 200 litres of seawater daily. Their filtration prowess not only cleans the water by removing particles but also aids in the deposition of these particles on the sediment. By clearing the water column of particles, oysters enhance light penetration to the sediment, to the benefit of seagrasses and their recovery – a key step towards re-establishing other valuable coastal habitats. During their larval stages, oysters have a strong affinity for settling on adult oysters, forming dense aggregations known as oyster reefs or beds. The 3D structure of a reef enhances biodiversity by providing food and shelter to numerous species and serves as a nursery ground for fish species.

In addition, the combined effects of sediment drawdown and bed stabilisation creating coastal protection can also transform these reefs into carbon sinks in the future, playing a crucial role in net zero ambitions.

Through the Native Oyster Restoration project, Ulster Wildlife have installed a further two native oyster nurseries since the first was established in Bangor Marina in 2022. These new native oyster nurseries in Glenarm Marina and Belfast Harbour (commercial port environment), house broodstock of 800 and 600 mature *Ostrea edulis*, respectively. Building a network of oyster nurseries within our sea loughs and along the coastline will help bolster the small, fragmented populations observed in the wild and hopefully aid in the natural recovery of this vital habitat.

Future stages of the project will aim to restore historical shellfish beds, re-connecting the MPA Network. This active native oyster restoration should allow Northern Ireland to establish ocean recovery firmly at the foundation of its seas.

Funding for this project comes from the DAERA (Department of Agriculture, Environment and Rural Affairs) Environment Fund, with the invaluable and generous support of Wilson Resources. We also appreciate the collaboration with Belfast Harbour, as well as the support extended by Bangor and Glenarm Marina.

5. Achieving net zero in tandem with nature's recovery

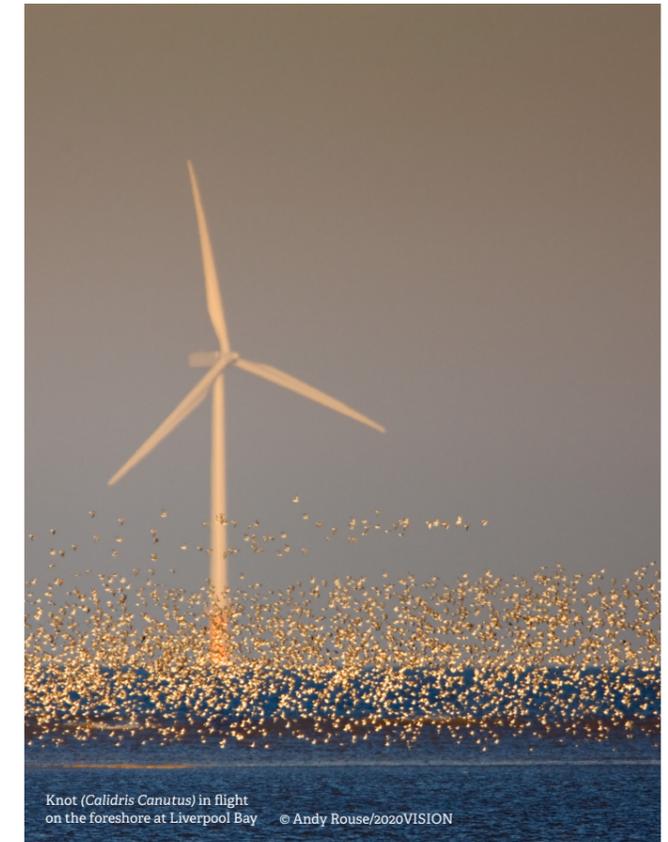
The Irish Sea Network supports the transition away from fossil fuels to renewable energy, recognising the need for marine renewables to be developed as part of the solution. However, the projected scale of offshore energy infrastructure expected to meet net zero is likely to have serious negative ecosystem scale consequences.

Offshore wind farms and their infrastructure (i.e. the current approach to the installation and maintenance of energy transmission cables) can cause disturbance, damage and loss of marine habitats and associated species (Natural England, 2023), including seabed habitats that can store huge amounts of carbon. We are concerned that the scale of development anticipated will have significant cumulative impacts on the marine environment and hinder its ability to recover.

Currently, offshore developments are having a negative impact on nature both inside and outside of MPAs. Cabling through MPAs is contributing to their unfavourable condition and the compensation being delivered is not fit for purpose. Although Marine Biodiversity Net Gain is being developed, it is not yet in place.

Recommendation: Prioritise achieving net zero in tandem with nature's recovery. This can be achieved through plans to reduce energy consumption and improve energy efficiency, developing sustainable marine renewable energy in the right location, at the right scale and with the right technology and implementing nature-based solutions.

- Recognise the need to reduce energy consumption and improve energy efficiency.
 - While offshore renewable energy will play an important role in meeting net zero, it is just one of a diverse mix of energy sources and it is crucial that there are also efforts to reduce energy consumption and increase energy efficiency (e.g. better insulating homes), reducing the demand for offshore wind. This will have the biggest positive impact on nature. The greenest energy is the energy we aren't using.
- Ensure sustainable development of renewable energy, with nature in mind, enabling both green energy and nature-based solutions to play a role in meeting net zero.
 - Where offshore renewables are required, they should use the most appropriate technology, at an appropriate scale, and in the most appropriate location. Sensitivity mapping will help to determine where these locations are.
 - Marine Spatial Plans should be used to reduce the impact of offshore wind developments on marine ecosystems by:
 - Implementing the mitigation hierarchy (avoid, reduce, mitigate, compensate) (CSBI, 2015). Including policies that ensure future developments avoid MPAs to allow their recovery. This will help improve the condition of the marine environment with the added benefit of helping speed up the consenting process.
 - Strategic delivery of Marine Biodiversity Net Gain to restore nature and create resilient ecosystems that can cope with the scale of future development. As part of the renewable energy transition, industry and government actions must go beyond halting biodiversity loss to instead ensure the restoration of resilient thriving seas (RSPB, 2022).
 - Strategic, spatially explicit planning of activities to ensure development occurs in areas of least environmental constraint (Case study 6, p28).
- The identification of innovative solutions to sustainable development to allow nature's recovery e.g. the strategic, holistic planning and delivery of cable corridors that also result in nature recovery highways and where appropriate, Nature Inclusive Design.
- Where there is limited data and evidence, the Precautionary Principle needs to be followed and Marine Spatial Plans should lay out actions for filling the data gaps.
- Incorporate plans for developing nature-based solutions.
 - Nature-based solutions should be included as part of the solution to meeting net zero and adapting to climate change. Marine habitats can lock away and store large amounts of carbon, playing a significant role in climate change mitigation and adaptation must be recognised in marine spatial plans and not diminished by industrialisation of the Irish Sea.
 - Blue carbon habitats need stronger protections. The vast subtidal muddy sediments in the Irish Sea are one of our largest blue carbon stores, holding carbon from thousands of years ago (Atwood et al., 2020). However, this habitat is threatened by activities that disturb the seabed such as trawling and dredging which may lead to the release of stored carbon. As well as protecting what we've got, actively restoring blue carbon habitats may help to enhance nature's ability to respond to climate change and mitigate the impacts.





South Stack © North Wales Wildlife Trust

Case Study 6. Strategic Resource Areas (SRAs)

The Welsh National Marine Plan (WNMP) sets out general sector specific policies, which collectively support the sustainable development of the Welsh sea, in line with the Well-being of Future Generations (Wales) Act 2015, the Environment (Wales) Act 2016, the Marine and Coastal Access Act 2009 and The UK Marine Policy Statement 2011. The first WNMP established a new strategic planning policy framework for Welsh seas. In order to make best use of the policies within the plan, specific planning tools are being developed which can enable an increasingly spatial and prescriptive approach.

Strategic Resource Areas (SRAs) are being mapped for tidal, wave, floating wind technologies, aggregates and aquaculture. These sectors are a vital means to enable Wales to protect its communities and wildlife from the impact of the climate emergency. They also represent huge economic potential and opportunities for Wales to secure its position as a world centre for marine energy technologies, whilst drawing in high quality jobs to coastal communities.

An SRA is a tool to safeguard areas of natural resource for potential future development. They will help to ensure a sector's interests are considered by others, support the management of sector to sector interactions (including how activities across sectors can co-exist within the same area), and provide a focus for further strategic planning. SRAs will direct important economic activity away from the most environmentally sensitive areas. SRAs promote a precautionary approach towards marine planning in line with environmental principles set out in the WNMP, enabling developmental progress whilst preventing environmental harm.

The Marine Planning Stakeholder Reference Group (SRG), whom support the Welsh Government in the development of its marine plan, will progress work undertaken on SRAs, including SRA mapping, Sector Locational Guidance, and Marine Planning Technical Statements. SRG work will integrate SRAs with wider UK-level planning and determine how to make best use of the Marine Planning Portal to advance understanding and assist developers and decision makers. The output of this work will provide greater spatial prescription for the protection of our seas and promotion of sustainable development.

6. Considering climate change

Climate change is significantly impacting our seas through rising sea levels, increasing sea surface temperatures, acidification, reduction in oxygen concentrations, changing salinity and changes in the frequency and intensity of extreme weather events.

In 2023, the global sea surface temperatures were the hottest ever on record (Copernicus, 2023) causing a marine heatwave in some UK waters. The impacts of climate change will have major implications for the Irish Sea's biodiversity and fisheries (UK Government, 2022). While some marine plan policies support building resilience to climate change there is a lack of consideration of future climatic scenarios and plans for how activities and their locations will need to adapt to these changes. Without considering climate change in Marine Spatial Planning, commitments to legislation and policies such as the UK's Environment Act (2021), the Isle of Man's Climate Change Act (2021) and the Republic of Ireland's Climate Action and Low Carbon Development (Amendment) Bill 2021 will not be met.

Recommendation: Consider climate change through scenario planning to build long term resilience of marine ecosystems and marine activities.

Action needs to be taken to prepare for the scale of future change and impacts on marine ecosystems. Marine Spatial Plans must incorporate:

- Plans to manage MPAs and coastal designations (e.g. coastal SSSIs) for the protection of blue carbon habitats, implementation of nature-based solutions and where appropriate, the active restoration of habitats that provide climate mitigating benefits. Protecting blue carbon habitats from disturbance will allow them to recover and enable them to function effectively for carbon storage. The Wildlife Trusts and partners have mapped blue carbon habitats within the Irish Sea (unfortunately the Republic of Ireland was outside of the scope of this project and therefore is not included in the map). This can be used to identify priority areas where blue carbon stores should be protected.
- Plans to remove additional environmental stressors that would otherwise further reduce nature's ability to withstand changing conditions. Protecting and restoring at least 30% of the Irish Sea in well managed MPAs will give marine life the best chance of adapting to climate change and enhance resilience through high biodiversity and providing ecological connectivity and space for facilitating range shifts. Protecting high biodiversity and carbon storing habitats is recognised as the most effective way to provide synergistic benefits for biodiversity and climate change in the short term (WWF and IUCN WCPA, 2023).
- Marine Spatial Plans must take account of nature's role in tackling the climate crisis by embedding nature-based solutions as core components of marine planning decisions and management strategies, sector plans, and policies, including how nations will adapt to the climate crisis on an Irish Sea scale. This will require Government incentives, legal frameworks and financial commitments to implement resilient nature-based solutions across all nations.
- Future climatic scenarios which can be used to plan the location of future activities and inform the implementation of mitigation and adaptation measures which could help increase our resilience to the impacts of climate change. Being merely reactive or adaptive will risk the loss of sensitive habitats and species and have an impact on sea users and industry. Marine Spatial Plans must be used to proactively implement management measures that facilitate the adaptation of marine ecosystems to these future climatic conditions.

7. Ensuring a just transition

Restoring nature and tackling the climate crisis will bring positive benefits to all. However, the prioritisation of activities will also have an impact on people, for example, through the removal of pressures from MPAs and displacement of activities that cannot operate within offshore wind farms. This needs to be recognised and communities need to be supported to adapt.

A just transition plan will be required for some industries affected by this process, supporting sea users to diversify and adapt to the changing priorities of our seas.

Continued expansion of offshore energy developments and new industries in the marine environment can cause conflicts between sea users and create uncertainty for people working in the marine sector. This can lead to poor mental wellbeing, particularly for those living in coastal communities who rely on the sea for their livelihoods. Without clear prioritisation of objectives and policies in marine plans, there will not be a clear understanding for marine users on where they can and cannot operate now and in the future.

Recommendation: Include a plan for achieving a just transition for sea users and coastal communities and include them at all stages of the planning process.

- Strategies must be in place to support marine users in adapting to new priorities. By supporting marine users, the levels of compliance should increase and the risk of creating new problems by moving pressures to other parts of the marine environment can be reduced.
- Include a stakeholder engagement plan. Local communities and sea users need to be included at all stages of the marine planning process, ensuring their voices are heard from the start.
- Individuals must be supported in the transition to alternative sources of sustainable income i.e. away from fishing within MPAs to sustainable fisheries (e.g. changing gear) and aquaculture activities outside of MPAs or alternative sources of sustainable income (e.g. responsible nature tourism). The removal of damaging activities from MPAs has been shown to achieve ecological benefits which further benefit local fishers in surrounding waters. However, fishers need to be engaged and compliant with management for these benefits to be seen.
- As part of the just transition, the fishing industry need more diverse and modernised fleets; this will ensure that net zero and nature's recovery remain at the centre of the transition. Digitalisation of fishing fleets, through financial support for innovative technologies (such as AIS and REM) could also improve monitoring compliance and enforcement of MPAs. This could not only help support fishers but also help to achieve Good Environmental Status.
- There must be plans to communicate with those impacted by MSPri and provide both financial and social support for individuals to minimise any of the negative health impacts and impacts on livelihoods.





Conclusion

A healthy and thriving Irish Sea underpins the economy, society and human well-being through the provision of essential goods and services (e.g. food provision, climate regulation, improved water quality, flood and coastal erosion reduction, tourism, recreation and education).

However, significant and widespread anthropogenic pressures mean that marine ecosystems in the Irish Sea are degraded. The scale of future activities and growing demand for sea space only add to these pressures, leaving little room for nature to recover. Marine Spatial Prioritisation offers an opportunity to see the negative trajectory for the marine environment reversed in the Irish Sea region.

While it may be a difficult and sensitive task to prioritise activities in the Irish Sea it must be done urgently, with tackling the climate and nature crises at the heart of the decision-making process. Nature must be recognised as the fundamental basis of all social and economic development and it should be made clear that all other marine activities rely on a healthy and thriving marine environment.

Although Marine Protected Areas are designated across the Irish Sea, the protection these sites actually afford is limited. If all nations around the Irish Sea are going to achieve 30 by 30 and other environmental commitments, effective management and monitoring of current sites is essential. We must also implement additional Marine Protected Areas with stricter protections that take a whole site approach as well as other effective area-based conservation measures. There must be cooperation between nations to create strategic, spatially explicit, ecosystem-based Marine Spatial Plans that put nature and climate at the heart.

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Appendices

Appendix 1: List of acronyms

CBD Convention on Biological Diversity	MPA Marine Protected Area
EBA Ecosystem Based Approach	MSFD Marine Strategy Framework Directive
GBF Global Biodiversity Framework	MSPri Marine Spatial Prioritisation
GES Good Environmental Status	OECS Other Area Based Conservation Measures
HPMA Highly Protected Marine Area	RoI Republic of Ireland
ISN Irish Sea Network	

Appendix 2: Data sources for Figures 1 and 2

Pressures	England	Wales	Scotland	Northern Ireland	Republic of Ireland	Isle of Man
Fishing	OSPAR					
Aquaculture	EMODnet		Aquaculture - Finfish and shellfish farms (including fishery sites) - data.gov.uk	Aquaculture Licences - Open Data - Datasets - Open Data NI	EMODnet	
Military Activity		Approximate using https://www.milfordmarina.com/	Used Coordinates NMPI			
Renewable Energy	Crown Estate		Used Coordinates NMPI		Approximate using https://codlingwindpark.ie/the-project/ and https://dublinarray.com/project-information/location/	Approximate using https://www.gov.im/media/1368069/appendix-16-offshore-wind.pdf
Oil and Gas	https://www.nstauthority.co.uk/data-and-insights/					
Navigation/ Shipping	MMO - AIS data 2015					
Ports	EMODnet					
Cables	Crown Estate		EMODnet			
Disposal site (dredging)	CEFAS				EMODnet	

Appendix 3: Offshore wind development targets for each nation of the Irish Sea

Nation	Current offshore wind capacity	2030 Target
UK (England, Northern Ireland, Scotland and Wales)	13.9 GW (fixed turbines) 78MW (floating turbines) ¹⁶	50GW of power from offshore wind by 2030, 5GW should utilise floating technology ¹⁷ (including 11GW in Scottish* waters and 1GW in Northern Irish waters**). * the Scottish Government are consulting on setting a further offshore deployment ambition ¹⁸ ** Northern Ireland should have at least 80% of its electricity consumption from renewable sources by 2030 ¹⁹
Republic of Ireland	25 MW ²⁰	7GW of power from offshore wind by 2030 5GW from fixed turbines and 2 GW from floating wind (under development by 2030) ²¹
Isle of Man	None	Supply 75% of power from renewable energy by 2026 and 100% of electricity from carbon neutral sources by 2030. This is likely to be primarily from onshore renewables rather than offshore (at least 20MW of locally generated, renewable electricity to be available by 2026 (onshore)) ²² 'Agreement for Lease' signed by government for a 700MW offshore wind farm to be developed. ²³

16. <https://www.great.gov.uk/international/content/investment/sectors/offshore-wind/>
 17. UK Government's British Energy Security Strategy
 18. Draft Energy Strategy and Just Transition Plan ([www.gov.scot](https://www.gov.scot/publications/draft-energy-strategy-transition-plan/)) <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>
 19. Climate Change (NI) Act 2022 <https://www.legislation.gov.uk/nia/2022/31/enacted/data.pdf>
 20. <https://www.energyireland.ie/esb-stands-ready-to-deliver-renewable-offshore-wind-energy-for-ireland/>
 21. Policy Statement on the Framework for Phase Two Offshore Wind <https://www.gov.ie/en/publication/f3bb6-policy-statement-on-the-framework-for-phase-two-offshore-wind/>
 22. Isle of Man's Climate Change Plan 2022-2027 <https://www.netzero.im/media/jkwbvija/isle-of-man-climate-change-5-year-plan.pdf>
 23. <https://www.gov.im/media/1368069/appendix-16-offshore-wind.pdf>

Appendix 4: Each nation's commitments to Marine Protected Areas

Nation	2030 Target
UK (England, Northern Ireland, Scotland and Wales)	Committed to the global target of ensuring that by 2030 at least 30 per cent of coastal and marine areas are effectively conserved and managed through ecologically representative, well-connected and equitable governed systems of protected areas and other effective area-based conservation measures (30 by 30). This has been included in the Kunming-Montreal Global Biodiversity Framework, and was agreed at the Convention on Biological Diversity (CBD) at COP15 ²⁴ . The UK Government and Devolved Administrations have committed to creating an ecologically coherent network of Marine Protected Areas (MPAs) in UK waters ²⁵ .
England	Committed to designate three Highly Protected Marine Areas in July 2023 and explore additional sites for consideration ²⁶ ; legal commitment through the Environmental Improvement Plan (2023) to ensure that 70% of designated features in MPAs are in favourable condition, with the remainder in recovering condition, before the end of 2042 ²⁷ (interim target for 48% of designated features in MPAs to be in favourable condition, with the remainder in recovering condition, by 31 January 2028) ²⁸
Northern Ireland	Supports protecting 30% of its seas by 2030. MPA network must be ecologically coherent and well-managed ²⁹ .
Wales	Committed to taking steps to strengthen Wales' Marine Protected Area (MPA) network by identifying new Marine Conservation Zones ³⁰
Scotland	Committed to implementing management measures throughout all MPAs by 2024 ³¹ ; working with all stakeholders to enhance marine protection beyond the current network; developing a new pathway to enhance marine protection with a focus on enabling community-led marine protection and co-developing Scotland's approach to enhanced marine protection with local people ³² . The Scottish Government is committed to a Natural Environment Bill which follows on from Scotland's Biodiversity Strategy to 2045 (published in 2022). It contains an agreement to protect 30% of Scotland's land and seas by 2030, and highly protect 10% ³³ . A biodiversity strategy delivery plan is currently being drafted on how to achieve these goals.
Republic of Ireland	Committed to the global target of ensuring that by 2030 at least 30 percent of coastal and marine areas are effectively conserved and managed through ecologically representative, well-connected and equitable governed systems of protected areas and other effective area-based conservation measures (30 by 30). This has been included in the Kunming-Montreal Global Biodiversity Framework and was agreed at the Convention on Biological Diversity (CBD) at COP15 ³⁴ . EU Biodiversity Strategy for 2030 set the target that, by 2030, at least 30% of the sea area should be legally protected with 10% of the sea area to be strictly protected for areas of very high biodiversity and climate value ³⁵ .
Isle of Man	The 2015-2025 Biodiversity Strategy sets out targets for managing biodiversity, minimising loss, and restoring or enhancing where necessary. Within this the government commits to conserving at least 10% of the marine ecosystem within effectively managed, ecologically representative and well-connected protected areas and other effective area-based conservation, by 2020. This target has been met through the designation of 10 Marine Nature Reserves covering over 10% of Manx territorial waters. The government aims to designate more, including offshore sites. In the Biodiversity Strategy, the government also sets targets for restoring at least 16% of the area of degraded marine ecosystems by 2025. The Isle of Man is signatory to the CBD and therefore 30 by 30 targets however this is still yet to be written into policy.

24. <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>
 25. <https://webarchive.nrsotland.gov.uk/3000/https://www.gov.scot/Resource/0041/00411304.pdf>
 26. <https://questions-statements.parliament.uk/written-statements/detail/2023-02-28/hcws585>
 27. <https://www.legislation.gov.uk/uksi/2023/94/made>
 28. <https://www.gov.uk/government/publications/environmental-improvement-plan>
 29. <https://hub.jncc.gov.uk/assets/39cde4b5-f14d-4cba-a569-9e024c933b0d>
 30. <https://www.gov.wales/written-statement-announcement-commencement-welsh-marine-conservation-zone-mcz-designation-pre>
 31. <https://www.gov.scot/publications/scottish-government-and-scottish-green-party-shared-policy-programme/pages/our-natural-environment/#Marine%20protection>
 32. <https://www.gov.scot/policies/marine-environment/highly-protected-marine-areas/>
 33. SG+SGP+Talks+-+Draft+Policy+Programme+-+version+7+-+FINAL+-+OFFSEN.pdf (www.gov.scot)
 34. <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>
 35. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

Appendix 5: List of recommended data to map to understand location of ecologically important areas

The ISN recommends that the following are mapped and incorporated into the planning process:

- Key species, habitats and geological features across their range including outside of MPAs (including vulnerable, threatened and endangered species, Features of Conservation Importance, designated features etc.)
- Areas of high biodiversity, high functional diversity and high productivity.
- Ecosystems with high sensitivity to human activities.
- Species, habitats and activities that are most vulnerable to climate change.
- Blue carbon habitats.
- Migratory routes and ranges for highly mobile species including marine mammals, cetaceans, sharks, birds and fish.
- Areas of ecological importance, including key breeding, spawning, foraging and nursery ground areas.
- Potential restoration areas for key habitats and species.
- Marine Protected Areas and other area-based conservation measures.

Seasonal and temporal measures must also be incorporated into plans so to account for seasonal migrations of species such as birds, fish and cetaceans.

Appendix 6: Status of Marine Plans around the Irish Sea

Nation	Name	Status
England	North West Inshore and Offshore	Adopted 2021 ³⁶
Scotland	Scottish National Marine Plan, Clyde Regional Marine Plan and Solway Regional Marine Plan	The National Marine Plan was adopted 2015, National Marine Plan 2 is currently being consulted on by Scottish Government's Marine Directorate (previously known as Marine Scotland) ³⁷ . Scotland also has a number of regional marine plans. A plan for the Clyde in the Irish Sea is being developed ³⁸ . Scotland also has Sectoral Marine Plans for example INTOG (Innovation and Targeted Oil and Gas (INTOG) Decarbonisation) and Offshore Wind ³⁹ .
Isle of Man	Isle of Man Marine Plan	Marine Infrastructure Management Act ⁴⁰ was passed in 2016. However, limited secondary legislation has been finished and currently there is no marine plan.
Northern Ireland	Northern Ireland National Marine Plan	A draft plan ⁴¹ was consulted on in April 2018, but to date it has not been published and adopted. Awaiting on Climate Change elements such as "MPA Strategy Review" and "Blue Carbon Action Plan" consultations.
Wales	Welsh National Marine Plan	Adopted 2019 ⁴² . Government are working to map Strategic Resource Areas in the marine environment highlighting areas where development is most suitable, helping to safeguard areas of natural resource. This work supports implementation of the Welsh National Marine Plan safeguarding policy ⁴³ .
Republic of Ireland	The National Marine Planning Framework	Adopted 2021 ⁴⁴ .

36. <https://www.gov.uk/government/publications/the-north-west-marine-plans-documents>
 37. <https://www.gov.scot/publications/scotlands-national-marine-plan-9781784128555/>
 38. <https://www.gov.scot/policies/marine-planning/regional-marine-planning/>
 39. <https://www.gov.scot/publications/initial-plan-framework-sectoral-marine-plan-offshore-wind-innovation-targeted-oil-gas-decarbonisation-intog/>
 40. <https://www.gov.im/media/1359557/marine-infrastructure-management-act-2016.pdf>
 41. <https://www.daera-ni.gov.uk/articles/marine-plan-northern-ireland>
 42. <https://www.gov.wales/welsh-national-marine-plan-0>
 43. <https://www.gov.wales/development-strategic-resource-areas#:~:text=An%20SRA%20is%20a%20tool,taken%20into%20account%20by%20others>
 44. <https://www.gov.ie/en/publication/60e57-national-marine-planning-framework/>

Appendix 7: Key priorities within each nation's marine plan

Country	Priorities
England	<ul style="list-style-type: none"> • Growth of a variety of industries and marine infrastructure • Enable activities to move quickly from concept to consent • Ensure management of activities contribute to the achievement of sustainable development and optimal use of natural capital • Enhance and protect vulnerable species and habitats • Maintain natural defences to CC and flooding • Improve wellbeing of coastal communities • Support a strong marine economy
Isle of Man	<p>There is no marine plan for the Isle of Man however, the Island Plan⁴⁵ outlines 5 key priorities (building great communities, health and wellbeing, environment to be proud of, strong and diverse economy and learning and development). Within these priorities the marine environment has no specific mention but is referred to indirectly through plans to:</p> <ul style="list-style-type: none"> • Develop a Plan for Climate Change Adaptation, including flood management and mitigation • Deliver sustainable sewage treatment across the Island • Review our approach to ensuring clean air, watercourses and bathing water by undertaking regular, year-round bathing water quality testing in areas based on use not designation, carrying out air quality monitoring in a variety of locations, and meeting or exceeding international standards in relation to environmental waste • Deliver a strategy for energy security, making renewable and green energy available for all Island residents and businesses
Northern Ireland (draft)	<ul style="list-style-type: none"> • Promote sustainable development • Realise the potential of energy resources and storage • Promote development of coastal communities • To promote the marine resource, its recreational value and its wider economic, environmental and social benefits to all • To promote the preservation and enjoyment of marine related heritage assets • To promote a healthy, resilient and adaptable marine ecosystem and an ecologically coherent network of Marine Protected Areas • To contribute towards climate change mitigation and adaptation measures • To continue to develop a sound marine evidence base in a co-ordinated manner, to increase understanding and to support the development, monitoring and review of marine plans
Republic of Ireland	<ul style="list-style-type: none"> • Environmental - ocean health • Economic - thriving maritime economy • Social - engagement with the sea
Scotland	<ul style="list-style-type: none"> • Ensure sustainable development and use of our marine area in a way which will protect and enhance the marine environment whilst promoting both existing and emerging industries • Manage human impact on the marine environment
Wales	<ul style="list-style-type: none"> • Sustainably manage natural resources and ensure seas are healthy and resilient to support a sustainable thriving economy • Improve health and wellbeing through access to, understanding of and enjoyment of the marine environment and maritime cultural heritage • Blue Growth - more jobs and wealth created • Strong contribution to energy security and climate change emissions targets

45. <https://www.gov.im/islandplan>



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