The Northern Ireland Marine Taskforce (NIMTF) is a coalition of non-government environmental organisations – it includes RSPB, Ulster Wildlife, Wildfowl and Wetlands Trust, National Trust, Friends of the Earth, Marine Conservation Society, Keep Northern Ireland Beautiful, Irish Whale and Dolphin Group, Surfers Against Sewage, Shark Trust and Northern Ireland Environment Link. The NIMTF has the support of approximately 100,000 local people. We are working towards healthy, productive and resilient seas for Northern Ireland.

Northern Ireland Marine Task Force response to: Blue Carbon Action Plan
Submitted: 9th August 2024

NIMTF thanks DAERA for the opportunity to respond to this public consultation on the Blue Carbon Action Plan (BCAP). NIMTF welcomes an increasing recognition of the role that blue carbon habitats play in tackling the joint climate and biodiversity crises. When implemented, NI will be the first nation in the UK to have an official Blue Carbon Action Plan. This is a fantastic opportunity for Northern Ireland (NI) to take the lead in the restoration, appropriate management and creation of blue carbon habitats as a nature-based solution to meet biodiversity objectives, but also relevant objectives in the Climate Change (Northern Ireland) Act 2022. NI's first BCAP comes at a crucial time, following on from the Climate Change (NI) Act 2022[1], which states:

Proposals and policies under section 29 shall as far as is practicable, support nature based projects that enhance biodiversity, protect and restore ecosystems, and seek to reduce, or increase the removal of, greenhouse gas emissions or support climate resilience.

Management of blue carbon habitats is becoming increasingly crucial as part of our response to the Climate Emergency, with three approaches core to this response: habitat protection, restoration and creation. This response will highlight key actions to achieve these approaches.

This BCAP can also facilitate objectives in the draft MPA Strategy Plan and Climate Sectoral Plans.

NIMTF would like to thank the department for the co-design approach for the BCAP and for the MPA Strategy Review for the development of these consultations, based on previous recommendations from NIMTF. Whilst this co-design approach to both consultations is appreciated, NIMTF will be submitting this response in this format as opposed to through the online portal due to the scope of the seascape approach for NI.

Proposed Vision

NIMTF welcomes the acknowledgement of the importance of blue carbon habitats and their role as described above in being able to contribute to the mitigation of climate change impacts; but based on timescales within the Action Table.

ACTION: DAERA should implement SMART targets which outline how this proposal is going to be reached at the incremental benchmarks of 2030, 2040 and 2050 to lead to the success of this Vision.
Given the intrinsic nature of the BCAP with the MPA Strategy Review and the linked goals to ecological connectivity and coherence of the MPA Network, it is important to:

ACTION: Ensure management and recovery also align with targets set for 2030 to establish the blue carbon capacity of available habitats and species both inside and outside of the MPA Network.

Action Table Components

1) **Evidence**

It is important to recognise the knowledge gaps remaining around blue carbon potential within NI.

ACTION: Increased data collection and improved knowledge on distribution, health, carbon storage values, sequestration rates, and likely response to climate change of blue carbon habitats must be prioritised.

An upcoming report by RSPB, The Wildlife Trusts (TWT) and WWF presents new data on blue carbon storage rates in the Irish Sea, including the NI coast. A summary of these findings and recommendations has been submitted to you by NIMTF member organisation RSPB as part of this consultation response.

More data on blue carbon, potential threats and potential restoration will not only be vital in supporting the BCAP, but other plans and strategies such as the MPA strategy, FMP's and the NI Marine Plan. Therefore regular updates and a forum to facilitate knowledge sharing should be created through this BCAP. The BCAP plan refers to the Biodiversity and Climate Working group (B&CWG).

ACTION: The role and function of the B&CWG needs terms of reference to be developed and a stakeholder mapping exercise of potential member organisations/people.

Priorities for DAERA for Evidence should include:

- **Develop a baseline inventory of all blue carbon habitats in Northern Ireland:** their extent, with local measurement of carbon sequestration rates (CSRs) and estimated total carbon storage by habitat, including understanding how the condition of habitat affects CSR.
- **Ground-truth current estimated extent and habitat suitability areas** in this blue carbon report *referring to Action 1.4* and identify habitat condition and any notable local pressures at each site.
- Investigate the likely response of blue carbon habitats to climate change and other pressures, especially those coastal habitats that are the current focus for practical restoration.
- Understand and evaluate the co-benefits of restoration, such as biodiversity gains, enhancement of other ecosystem services such as flood protection, water quality improvement, tourism, and community buy-in/ownership.
- Feed into the Northern Ireland Adaptation Plan, Climate Action Plans and the NI Environment Plan/Environmental Improvement Plan (EIP)/Biodiversity Strategy, Local

Development Plans; Living with Water Programme and other cross departmental strategic planning.

ACTION: Raise awareness of blue carbon contribution to the UK's greenhouse gas inventory[2] under the Paris Agreement[3] via engagement with policy-makers and the Climate Change Committee.

Many countries are already including blue carbon habitats within their Nationally Determined Contributions (NDCs) to the Paris Agreement greenhouse gas (GHG) inventory: this helps better understand the role these habitats have in carbon storage and sequestration and provides an opportunity for habitat restoration to increase carbon storage and potentially offset emissions, which will provide a Nature-Based Solution (NbS) that assists countries in achieving net zero emissions.

NIMTF wants to raise awareness that this BCAP can support further targets in this Action Plan, not only in achieving net zero emissions targets, but effective work on blue carbon habitats will also assist in meeting the Kunming-Montreal Global Biodiversity Framework targets[4]:

Table 1. BCAP Action Table Themes against the relevant GBF Targets.

Action Plan Themes	GBF Targets
Evidence	Target 1 - Plan and Manage all Areas to Reduce Biodiversity Loss Target 2 - Restore 30% of all Degraded Ecosystems Target 3 - Conserve 30% of Land, Waters and Seas Target 6 - Reduce the Introduction of Invasive Alien Species by 50% and Minimise Their Impact Target 7 - Reduce Pollution to Levels That Are Not Harmful to Biodiversity Target 8 - Minimise the Impacts of Climate Change on Biodiversity and Build Resilience Target 10 - Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries and Forestry Target 20 - Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity
Prioritisation	Target 1 - Plan and Manage all Areas to Reduce Biodiversity Loss Target 2 - Restore 30% of all Degraded Ecosystems Target 3 - Conserve 30% of Land, Waters and Seas Target 6 - Reduce the Introduction of Invasive Alien Species by 50% and Minimise Their Impact Target 7 - Reduce Pollution to Levels That Are Not Harmful to Biodiversity Target 8 - Minimise the Impacts of Climate Change on Biodiversity and Build Resilience Target 10 - Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries and Forestry Target 20 - Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity
Restoration and Creation	Target 1 - Plan and Manage all Areas to Reduce Biodiversity Loss Target 2 - Restore 30% of all Degraded Ecosystems

	Target 3 - Conserve 30% of Land, Waters and Seas Target 6 - Reduce the Introduction of Invasive Alien Species by 50% and Minimise Their Impact Target 7 - Reduce Pollution to Levels That Are Not Harmful to Biodiversity Target 8 - Minimise the Impacts of Climate Change on Biodiversity and Build Resilience Target 10 - Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries and Forestry Target 20 - Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity
Funding	Target 5 - Ensure Sustainable, Safe and Legal Harvesting and Trade of Wild Species Target 7 - Reduce Pollution to Levels That Are Not Harmful to Biodiversity Target 8 - Minimise the Impacts of Climate Change on Biodiversity and Build Resilience Target 10 - Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries and Forestry Target 18 - Reduce Harmful Incentives by at Least $500 Billion per Year, and Scale Up Positive Incentives for Biodiversity Target 19 - Mobilise $200 Billion per Year for Biodiversity From All Sources, Including $30 Billion Through International Finance
Governance	Target 1 - Plan and Manage all Areas to Reduce Biodiversity Loss Target 3 - Conserve 30% of Land, Waters and Seas Target 5 - Ensure Sustainable, Safe and Legal Harvesting and Trade of Wild Species Target 6 - Reduce the Introduction of Invasive Alien Species by 50% and Minimise Their Impact Target 7 - Reduce Pollution to Levels That Are Not Harmful to Biodiversity Target 8 - Minimise the Impacts of Climate Change on Biodiversity and Build Resilience Target 14 - Integrate Biodiversity in Decision-Making at Every Level Target 21 - Ensure That Knowledge Is Available and Accessible to Guide Biodiversity Action
Comms.	Target 5 - Ensure Sustainable, Safe and Legal Harvesting and Trade of Wild Species Target 10 - Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries and Forestry Target 11 - Restore, Maintain and Enhance Nature's Contributions to People Target 20 - Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity Target 21 - Ensure That Knowledge Is Available and Accessible to Guide Biodiversity Action

Referring to Action 1.1 -
ACTION: DAERA should state a list of what evidence is being consolidated, who will be reporting on the data and whether this will be standardised?
NIMTF and members are aware of the difficulties around information sharing between and outside of Departments to ensure a holistic data sharing approach. The BCAP provides an opportunity to develop an overall comprehension of blue carbon habitats monitoring and data framework available between Departments and to develop further collaboration for knowledge sharing and communication moving forward.

Referring to Action 1.3 -
ACTION: Who will be responsible for delivering the monitoring programme for existing blue carbon habitats inside and outside of MPAs and what will be the methodology?.

Further to this, any potential role for citizen science needs to be outlined clearly within the proposed monitoring programmes. This should follow the overarching Saltmarsh Handbook, but should also be used to develop a Handbook specifically for NI.

Referring to Action 1.5 - Story Maps have been utilised previously by DAERA to share knowledge.

ACTION: DAERA develops and implements a communication Strategy tracking the impact (qualitative and quantitative) of differing communication methods demonstrating effective communication which increase a) awareness b) capacity to support/implement the blue carbon action plan c) influence change over a variety of timescales.

Focusing on Story Maps may not fully showcase the benefits Blue Carbon habitats provide and the urgent need to protect and restore them in NI waters. NIMTF would advise DAERA to work in conjunction with the Departments for Education, Health, Communities and Infrastructure to identify additional methods to showcase the wider ecosystem benefits blue carbon habitats provide for society. NIMTF would recommend that a communication strand is set up that is cross-departmental to better communicate these benefits moving forward, with input from NIMTF members such as Ulster Wildlife (UW), RSPB NI, National Trust (NT), WWT, Marine Conservation Society (MCS) and WWF. These should link in with *Theme 6) Communication*, taking lessons learned from previous wide-ranging communication plans[5] to ensure that these are effective in the future when engaging across different departments and with the public.

ACTION: With reference to Story Maps and a Communication Strategy, this must be co-designed with media, educational and communication experts and to outline a comms strategy that requires focus groups from specific, intended audiences.

NIMTF thanks DAERA for adopting the co-design approach to both the BCAP and MPA Strategy Review and would strongly recommend that this approach is continued into the future.

Furthermore, we would seek a timescale of relevant actions and if these will build on the work undertaken through to the NI Coastal Observatory[6]? The Coastal Observatory takes high resolution imagery of coastal habitats around NI, showcasing in detail different species and habitats. Further work and links here should be appropriate to ensure that we are monitoring and managing blue carbon habitat extent to ensure we do not experience marine net loss. Relating to the monitoring components, this will be integral in inclusion of the Coastal Observatory.

ACTION: Link the Blue Carbon Habitat Mapping into the Coastal Observatory and into the Marine Map Viewer - including *a 200m buffer.*

Long-term data collection surrounding blue carbon is necessary, given the drastic loss of blue carbon habitats, - 92% of seagrass meadows, 86% of saltmarsh and 95% of oyster reefs (Blue Marine 2024)[7].

ACTION: 'On the ground' practical restoration is taken urgently to protect, restore and recreate these habitats using existing data that is already available from attached and upcoming reports to prioritise threats that should be alleviated and restoration efforts required. For further information, please see NIMTF member RSPB's response to this consultation.

Condition of current Blue Carbon habitats in NI

The table below highlights the different blue carbon habitats and species that we have within the NI MPA Network and the current condition assessments of these features as of 2014 - 2019 as requested from DAERA in 2023 from the Marine and Fisheries Division (MFD):

Table 1. Blue Carbon Habitats featuring within the NI MPA Network, detailing the species, habitat and associated MPA designation and corresponding current Condition Assessment (2014-2019) (DAERA, *pers. corres.*)

Species/Habitat	MPA Designation	Condition Assessment
Saltmarsh		
Coastal Saltmarsh	**Carlingford SPA**	**Unfavourable**
Seagrass		
Subtidal seagrass (Zostera marina beds)	Waterfoot MCZ	Favourable
Reef Communities		
Reefs	The Maidens SAC Pisces Reef Complex SAC Skerries & Causeway SAC **Rathlin Island SAC** **Strangford Lough SAC**	Favourable Favourable Favourable **Unfavourable** **Unfavourable**
Maerl	Red Bay Church Bay, Rathlin The Maidens	Unknown Unknown Unknown
Benthic Communities		
Horse Mussels	Strangford Lough MCZ	Available after consultation
Ocean Quahog	**Outer Belfast Lough MCZ**	**Unfavourable**
Deep Sea Bed	Rathlin MCZ	Favourable
Sea Pen & Burrowing Megafauna Communities (utilises mudflat and	**Queenie Corner MCZ** **South Rigg MCZ**	**Unfavourable** **Unfavourable**

sandy habitats)		
Mudflats		
Intertidal Mudflats and Sandflats	**Murlough ASSI** Ballycormick Point ASSI Carlingford Lough ASSI Killough Bay and Strangford Lough ASSI Outer Ards ASSI Tyrella and Minerstown ASSI Strangford Parts 2, 3 and 4 ASSI	**Unfavourable** Favourable Favourable Favourable Favourable Favourable Favourable
Mudflats and sandflats not covered by seawater at low tide	**Murlough SAC** Strangford Lough SAC	**Unfavourable** Favourable
Subtidal Mud	**Queenie Corner MCZ** **South Rigg MCZ** **Carlingford Lough Ramsar**	**Unfavourable** **Unfavourable** **Unfavourable**

Whilst the majority of the above features are currently in 'Favourable' condition, this will need to be maintained through effective management. It should be noted that these condition assessments only assess the biodiversity components for species and habitats associated with blue carbon, but do not provide further information on the CSR of these habitats and species, based on data supplied by DAERA's MFD. No data has been provided by NIEA in terms of the condition assessments relating to species and habitats within their responsibility.

ACTION: NIEA and Marine Division should work together to ensure that condition assessments of coastal habitat - eg Saltmarsh are both available publically in the same place to support the blue carbon action plan

2) <u>Prioritisation</u>

DAERA mentions '**By 2025 identify and agree a mechanism of prioritisation of Northern Ireland's blue carbon habitats for management, restoration and creation'** The potential for blue carbon habitats to store and sequester carbon decreases with the ongoing destruction of these sites, with for example seagrass and saltmarsh disturbance releasing quantities of greenhouse gases into the atmosphere[8]. Despite the potential to contribute to carbon emission mitigation Blue Carbon habitats are not being monitored or protected in sufficient volumes; with many of these habitats in a degraded condition.

ACTION: Ensure there is a definition for Blue Carbon Habitat and that it includes soft sediment such as mudflats and additional biotic habitats too before prioritisation is completed.

NIMTF considers that the Action Table lacks consideration of soft sediment muddy habitats and seabed habitats; with priorities given to saltmarsh and seagrass. Further work to expand on recommendations and requirements for the protection, management and prioritisation of these habitats can be found in NIMTF member RSPB's submission to this consultation. This suggests that some decisions have already been made regarding prioritisation as outlined in other actions.

There is an urgent need to manage threats to coastal blue carbon habitats, with an emphasis first on protecting existing areas of these habitats, then restoration and finally potential recreation of habitats. It is ineffective to focus all efforts on recovery if we are not first alleviating pressures.

NIMTF would strongly advocate for below impacts being addressed as a priority:

- Disturbance from fisheries and other bottom impacting activities

Many blue carbon habitats (saltmarsh, kelp, seagrass) and carbon storing benthic features are highly sensitive to physical disturbance, affecting numerous species e.g. burying and subsequent reduction of 70-70% of maerl beds and significantly reducing the structural integrity[9,10]; an elimination of a historical horse mussel reef bed located off the South of the Isle of Man between 1970s and 1980s; including the reduction of 59-90% of associated biodiversity communities for this area and Wales, and reduction of horse mussel reef beds in Strangford Lough in 2009[11,12,13,14]; soft sediments where exposure to scallop dredging reduced available biodiversity and created a much less 3-dimensional structure[15]. It is proposed that soft sediments are capable of recovering if they are protected from fishing, but the timeframes in which this occurs differ depending on species[16,17].

Fishing methods that can have the greatest impact include bottom trawling, which can result in direct damage to large areas of seabed, physically removing habitat. If occurring on a regular basis, the habitat will not be able to recover at a sustainable rate, with DAERA's 2020 assessment on commercial fisheries indicating that bottom trawling can have long-term devastating impacts on carbon sequestering benthic communities, especially features of Marine Conservation Zones (MCZ)[18,19]. Static gear methods such as potting also have the potential to disturb vulnerable habitat, e.g. gear and rope damage of seagrass meadows. NIMTF welcomed new bye-laws introduced in January of 2022, restricting bottom-trawling and introducing management measures in nine MPAs in NI[20], however efforts are needed to ensure these sites are monitored to assess for efficiency in the measures which have been introduced.

ACTION: Management measures introduced consisting of SMART targets to reduce impact to the seabed and benthic carbon-storing marine features and ensure sufficient enforcement of existing measures.

Finally, we must ensure that there is sufficient enforcement in place to ensure that existing measures are being adhered to; all of these actions have the potential to contribute to the recovery of blue carbon habitats and species. To reduce the impact from fisheries to blue carbon habitats:

ACTION: Measures within this Action Plan should be cross-referenced within the MPA Strategy Review and existing Fisheries Management Plans (FMPs) for the Inshore and Demersal stocks[21], as well as other relevant cross departmental policy (not limited to) such as the Climate Action Plans, Regional Development Strategy and the Environmental Improvement Plan.

ACTION: Prohibit bottom-trawling to reduce the impact of seabed disturbance in key sites within MPAs around blue carbon features. These sites potentially could relate to those featuring reef systems which not only support biodiversity, but also promote the formation of carbon-storing benthic species.

An upcoming report by RSPB, The Wildlife Trusts (TWT) and WWF showcases new data on blue carbon rates in the Irish Sea. This report highlights the significance of sublittoral sediments as carbon stores and the need for greater protections for the seabed. A summary of these findings and recommendations has been submitted to you by NIMTF partners RSPB as part of this consultation

response. The BCAP needs to recognise the interconnectivity of the marine blue carbon cycle, and terrestrial linkages, with the role of phytoplankton and algae on carbon capture and the storage of that carbon in soft sediment and habitats such as shellfish beds, mud, seagrass meadows and saltmarsh. This highlights the need for a seascape approach (Blue Marine 2024)[7].

The aquaculture industry is expanding in NI. When assessing recent marine licensing applications we are witnessing an overlap in coastal areas that support blue carbon habitats such as seagrass meadows[22]. The impact of unregulated aquaculture activities occurring on Lough Foyle in the form of unlicensed installation of pacific oyster trestles[23,24] should be stopped. Unregulated and unlicensed activity in the SPA and wider lough is of great concern as this may result in habitat destruction, specifically for seagrass beds in that region. Both trestles and access to the trestles can result in the disturbance of seagrass in the lough which is not only a carbon store, but a vital component of the wider marine ecosystem- for example, acting as a food source for birds. NIMTF are therefore asking for action from DAERA to guarantee the cessation of all unlicensed aquaculture activities and undertake an assessment of all aquaculture activity in NI to ensure it is being managed sustainably to ensure impacts on marine habitats are stopped and habitats restored. Aquaculture across NI waters must be rigorously regulated to ensure no negative impacts to species and habitats. Furthermore, DAERA must consider the potential impacts that all in-situ aquaculture infrastructure can have on blue carbon habitat's CSR and ensure adequate enforcement is in place to manage these impacts in line with condition licences. Further information in relation to this can be found in our response to New Aquaculture Proposals for Mill Bay[22].

- Infrastructure and development

Many coastal habitats, including blue carbon habitats are being lost as a result of coastal squeeze, land reclamation and the construction of hard infrastructure flood defences. NIMTF would advocate for improved integration of climate and nature policy that prioritise NbS throughout the marine environment to reap benefits for both nature and climate; e.g. before defaulting to technological or hard infrastructure solutions. NbS should be prioritised to provide cost-effective results for nature and climate change adaptation, e.g. exploring saltmarsh restoration as a soft engineering approach to coastal erosion. This can be achieved through greater utilisation and engagement with the NI Coastal Forum[25] as a route to achieve further inclusion of climate and nature policy as this engages across DAERA and the Department for Infrastructure (DfI). NIMTF member National Trust engages with this forum in relation to their most recent climate adaptation policy[26]. This is also within the legislation through the NI Climate Act

ACTION: NBS solutions should be prioritised in any Coastal Management work - ideally through a Shoreline Management Strategy which takes into consideration the potential impact on Blue Carbon and Other Coastal Habitats.

This approach should also be the key consideration when reviewing energy and offshore wind infrastructure. With the projected expansion of offshore wind development, infrastructure such as cabling must be well planned to avoid sensitive blue carbon habitats.

To ensure that we are achieving nature-positive sustainable developments in the future, we must implement the following through marine spatial planning:

- **ACTION: Positioning of cabling through blue carbon habitats must minimise and mitigate impacts to cause least disturbance**

- **ACTION Implementation of the Mitigation Hierarchy whereby in the first instance, any impacts must be avoided, where this is not possible then the impacts must be minimised. Only where this is not possible then sufficient mitigation measures must be put in place.**
- **ACTION: Follow the Precautionary Principle[27] where data and understanding of interactions is lacking**
- **ACTION: Spatially prescriptive NI Marine Plan**
- **ACTION: Implementing a framework of mitigation measures which promote marine recovery of species and habitats - e.g inclusion of ECOncrete (and similar blue grey methods where NBS are not suitable) into construction[28]**

This is further outlined within fellow NIMTF member, RSPB's Powering Healthy Seas Report 2022[29]. We must ensure that there are ties to wider policy such as the Nature Restoration Strategy, Offshore Renewable Energy Action Plan[30] (OREAP). NIMTF would reiterate that the Mitigation Hierarchy is followed for future marine developments; whereby in the first instance, any impacts must be avoided, where this is not possible then the impacts must be minimised. Only where this is not possible then sufficient mitigation measures must be put in place. Implementing the Mitigation Hierarchy will make provision and capacity for marine recovery. See our response to the MPA Strategy Review.

The above approach must inform the development of the OREAP[30] to ensure sustainable development in harmony with nature. NIMTF would recommend linking in with any communications opportunities to ensure the correct connection message between citizen science and the effective use of data to include and combine strands for *Theme 6) Communications*.

- Pollution

Blue carbon habitats are threatened by a variety of pollutants, including nutrients, sewage, and microplastics. For example, runoff of pollutants from the land introduces chemicals into the water that can damage or kill seagrass[31]. Fertiliser runoff typically contains nitrogen, which promotes rapid blooms of algae, which can capture significant volumes of carbon[32], but this needs to be weighed against the cumulative carbon storage rates of the species and habitats which are affected also. Further research is needed to explore where potential new stores can be created. The blooms deplete oxygen in the water and block sunlight, killing the seagrass. According to the WFD Report[33], GES has not been met for water pollution sources in NI, so must be addressed urgently. According to the most recent report from NI Water for Belfast Lough, 5 of the main treatment works which serve >30% of the NI population have no capacity. Shellfish water classification shows that water quality is declining, with 270 overflows of which 80% are unsatisfactory (Belfast Lough Report, 2024[34]).

As many of the pollution sources for the marine environment are of terrestrial origin, increased action is required to manage the terrestrial- marine interface. Engagement with stakeholders on land will be vital to garner a less siloed mentality across the terrestrial and marine sectors. Collaboration will create solutions that address high pollution rates in our oceans[35].

ACTION: There needs to be a coastal Stakeholder group which includes representatives from the land-sea interface to understand and build capacity of the risks and opportunities including the farming and tourism, water industry as well as the marine representatives.

Increased resourcing to monitor outflows and inadequate waste systems across the NI region will be necessary. Barriers and challenges such as investment, government policies around infrastructure and the sustainability of sources of pollution entering water bodies therefore need to be urgently addressed. Nature-based solution (NbS) projects such as DfI Living with Water Project[36] (LwWP)

provides a plan for wastewater treatment within the Belfast area and can help reduce the impact. However, these programmes must have long-term, sustained funding.

- Invasive Non-Native Species (INNS)

INNS are one of the main direct drivers of biodiversity loss at the global level[37]. The Invasive Alien Species Strategy[38] for NI recognises the ecological effects of invasive species are often irreversible once established and can be extremely difficult and costly to control and eradicate.

Common cordgrass[39] is a species affecting native blue carbon habitats such as saltmarsh habitat and eelgrass, specifically on Strangford Lough[40], crucially this habitat is effectively protected and managed. We recognise that Spartina can also be an efficient carbon store as well as delivering other ecosystem services so management needs to take the latest research into consideration and be prepared to change current practice. NIMTF wants to see a robust biosecurity programme which efficiently manages, and leads to the future prevention of INNS within marine areas where we are aware that INNS is an issue. An INNS Action Plan, or Biosecurity Strategy needs to outline how DAERA are intending on tackling the issue practically on the ground. Furthermore, under changing environmental conditions it is likely that the impact of non-native species may change, such as the current risk of pacific oyster spawning in our elevated temperatures. Monitoring protocols and risk-assessment of non native aquaculture should consider the potential impact on natural species and habitats, but also to assess the CSRs of invasives.

- Climate Change

Managing Blue Carbon habitats is key in Climate Adaptation and Mitigation, however, the changing climate influences the key characteristics of the marine environment, weakening resistance of BC habitats, negatively impacting and ironically resulting in release of further carbon.

With atmospheric CO2 exceeding 412_{ppm} in 2021 and projected to increase by 2.4_{ppm} per year over the last decade in particular; ocean acidification will create cumulative challenges for species which create calcium carbonate-based shells in the marine environment[41] alongside increasing sea level and temperature. As species and habitats that sequester carbon will rely on being able to utilise soluble carbon within the marine environment above a threshold of formation, ocean acidification will provide challenges in the formation of shells as sea levels rise, upping this threshold, alongside the dissolvement of calcium carbonate-based shells and structures. If no action is taken, then there is high potential for the loss of habitats and species which fall into the calcium carbonate-based structure category. The integrity of MPA networks; their species and key habitats - native oysters, horse mussels, maerl beds, etc - could be affected through combined changes in temperature and ocean acidification, adding additional cumulative impacts to challenges already faced to meet ecological connectivity and coherence - e.g. within the UK between 84% and 92% of seagrass has been lost since 1940 (Jones and Unsworth, 2016)[42]; Elasmobranchs, or sharks, skates and rays will face several challenges, such as embryonic development disturbance, behavioural changes, and migratory impacts due to electromagnetic fields[43] (EMF) coming from cabling from offshore renewable developments; and the unregulated gathering of shellfish, especially native oyster in Strangford Lough[44]. The risks on the marine environments from climate change are wide ranging, for more detail refer to the CCRA's Evidence Report for NI Summary (2021)[45] and the Marine Climate Change Impacts Partnership (MCCIP)[46]. For further information, see NIMTF and member responses to the MPA Strategy Review.

Sea level is expected to rise by between approximately 14 and 19cm by the 2050s[45] with a concern that at least 30% of Ireland's coastal wetlands will be lost given a 1m scenario[47]. The UK is currently

following the H++ Scenario[48] for sea level rise, showing a higher than predicted level. This will result in further degradation of habitats such as seagrass, which rely on photosynthesis, and will require higher light levels from shallow waters. This has the potential to fuel the climate crisis further, as blue carbon habitats release greenhouse gases and lose the ability to store large quantities of carbon.

NI's Marine and Natural Capital Project (MANACA)[49] gives an indication as to the natural capital value of blue carbon habitats; stating that NI's marine environment could provide societal benefits in the range of £51.07 million - £83.28 million; whilst the MPA Network provided £20.81 million - £33.76 million (in 2019 prices). In relation to the value of blue carbon habitats, all sites were treated as 'typical', meaning that one hectare of coastal saltmarsh could deliver the same quantity of societal benefit regardless of its location. More data around the quality and management benefit of blue carbon habitats need to be prioritised to guide data collection in order to make the values of NI's marine natural capital more accurate, precise and robust. Degraded and impacted saltmarsh are a contributor of carbon dioxide and methane; this impact must be addressed through management.

ACTION: Contribute to 1) Evidence in assessing with greater accuracy the marine natural capital of blue carbon habitats based on implementing recommendations from the NI MANACA Report.

Although less accessible and a more complex habitat to understand, carbon stored in from benthic mud habitats should not be overlooked. As stated by NIMTF member WWF: '*Seabed sediments are thus by far the most important habitat for carbon storage in the Irish Sea and Welsh Coast Region*'[50].

In order to achieve a better understanding of the complex habitats and their interactions with carbon stored in benthic mud habitats, we must ensure that these features are within prioritised monitoring programmes.

Below are a list of some, but not all knowledge gaps that need dedicated focus:

ACTIONS:

- **Blue carbon monitoring programme - monitor extent, impacts and pressures.**
- **MEasure the impact of large scale development on priority species & habitats in NI.**
- **Understand the genetic diversity of many priority species in NI, such as Native Oyster populations and how that impacts their resilience and productivity.**
- **Accurate understanding of blue carbon storage quantities in NI.**

By integrating the above into a blue carbon monitoring programme, we will develop a clearer picture of the intricate interactions taking place to better understand the challenges and needs facing these habitats to improve their ability to CSR.

Prioritise Enforcement

No management measures put in place will be as effective without well-funded and resourced enforcement to ensure that there is compliance with the rules and regulations put in force. Our blue carbon habitats have the potential and capacity to contribute towards tackling some of the issues of climate change, but without enforcement and management measures in place they cannot do this.

Blue carbon will not be the complete answer to tackling the climate crisis and work must be done under the Green Growth Strategy and associated Climate Sectoral Plans to rapidly reduce carbon

emissions from different sectors. This must be done alongside the development of blue carbon habitats as an NbS.

Comments of Actions in Theme 2) Prioritisation

Referring to Action 2.1 - DAERA needs to review the network/group around these projects and the challenges facing the Marine Hub.

Referring to Actions 2.2 / 2.3 - The consultation packet mentions a Biodiversity and Climate Working Group (B&CWG), but does not mention whether this sits in house within DAERA, or if this will be composed of the co-design stakeholders or others.

ACTIONS:

- **Define the Biodiversity and Climate Working Group - this needs a stakeholder mapping exercise to ensure the right members are present**
- **Develop terms of reference and remit (which also need to be transparent and issues covered) so right stakeholders are involved.**
- **Clarify how this group fits with other existing and developing structures - eg (CNCC and the new High Level Science Advisory Group)**
- **Clarify if this group will be leading on the codesign process (or advisory capacity)**
- **Ensure any work plan produces relevant SMART Objectives.**

Referring to Action 2.6 - An evidence paper needs a specific timeline for effective implementation. NIMTF have concerns with the wording of this particular action in that it narrows the scope of research with a focus on prioritising *saltmarsh and seagrass projects* - resulting in a pre-determination of projects before the evidence has been fully gathered.

ACTION: Broader inclusion of habitats and species such as benthic reefs, mudflat habitats, Kelp, and wider mud-based seabed sites.

3) Restoration and Creation

Inside and outside of MPAs, crucial blue carbon habitats will help act as NbS by drawing down carbon, whilst also providing tangible benefits to biodiversity and acting as a natural defence against increased storminess. A long-term programme of restoration must be established in NI to increase blue carbon habitats around our coasts, including seagrass meadows, maerl and saltmarsh.

DAERA must first acknowledge the challenges with habitat restoration. For some habitats, there is a strong body of evidence to suggest that creation/restoration measures should be possible - e.g. Project Seagrass projects such as Restoration Forth[51] for establishing native oysters in Scotland which developed a toolkit to lead on community marine restoration; ReSOW[52] which links in with fishing industry to consider the marine natural capital value of blue carbon habitats; water quality[53] to assess the health of seagrasses in the UK and to reduce further impacts from unhealthy water conditions to seagrasses. For those habitats where good evidence exists with regard to creation through physical interventions (notably managed realignment of saltmarsh habitat), outcomes of such habitat creation schemes can sometimes be difficult to predict and it can take up to several decades for habitat equivalency with adjacent habitats to be reached (though it can equally happen fairly quickly - mudflat can quickly transition to saltmarsh in estuaries with high sediment loads).

Restoration efforts are likely to be more successful in areas with existing individuals, however, some restoration and creation methods rely on the sourcing or harvesting of seed or brood stock (e.g. establishing *Zostera spp*. or *O. edulis* beds), and in many cases suitable sources may be scarce or themselves located within existing marine protected areas[54]. All of these aspects must be considered by the department to aid in implementing actions from the BCAP.

As a first step, DAERA must identify pilot projects for coastal blue carbon restoration through:

- Protect and restore what we already have.
- Develop the blue carbon restoration feasibility GIS and identification of habitat condition and local carbon sequestration rates, followed by-
- Prioritisation of habitats based on their: existing and future potential; range carbon sequestration and storage potential; co benefits including for biodiversity and adaptation resilience; and practicality of restoration actions (exploring the options of co-restoration of habitats).
- The development of partnerships, securing funding and building capacity locally for blue carbon restoration with flagship local projects will inspire further habitat restoration efforts and demonstrate viability, while also monitoring the co-benefits of habitat restoration such as biodiversity value, accretion and erosion protection.

Theme 3.1 Protection and Restoration within MPA network

It is vital, in conjunction with NI's MPA strategy review, that DAERA develop recommendations for the establishment of climate smart management of MPAs, which preserve natural blue carbon ecosystem functions and processes.

The estimated current extent of coastal blue carbon habitats (saltmarsh, seagrass meadows, kelp forests, and shellfish beds) in Northern Ireland (NI) is 658 km^2, with 371 km^2 occurring within the inshore MPA network. The carbon sequestration rate of the inshore MPA network is estimated to be 14,707$tCyr^{-1}$. There is potential to triple the blue carbon value of the MPA network to 52,958$tCyr^{-1}$) through effective protection and habitat restoration/creation within the MPA network[54].

An upcoming report from RSPB, TWT and WWF provides updated figures. Please refer to the RSPB summary submitted to this consultation response.

Some Northern Irish blue carbon habitats are protected from threats, based on their contributions to our biodiversity, mainly in the form of marine protected areas (MPAs). For example, Waterfoot Marine Conservation Zone (MCZ) is a small embayment offshore from the east coast of County Antrim designated for seagrass beds (*Z. marina*)[55]. However, blue carbon habitats and species present within MPAs are not necessarily protected if they are not the features for which the site was designated. Effectively protecting current blue carbon extent and enhancing their blue carbon potential through the implementation of fit-for-purpose management plans and habitat restoration and/or creation within the MPA network, there is potential to at least triple the blue carbon value of the MPA network to 52,958$tCyr^{-1}$ [54].

It is now vital that DAERA take this opportunity and incorporate the carbon sequestration value of blue carbon habitats into the MPA designation and targets within their management process, leveraging existing policy commitments for this purpose and making MPAs 'climate smart'. This could involve implementing the five step plan below for incorporation of blue carbon protection in existing

Marine Protected Areas, levering existing policy commitments for this purpose and making MPAs 'climate smart'.

A five-point plan for improving the protection and effective management of blue carbon ecosystems in MPAs under the CBD in support of the Paris Agreement on climate change (Laffoley, 2020)[56].

1. Recognise the full extent of blue carbon ecosystems present in MPAs
2. Act on operations likely to cause deterioration or disturbance and take the additional management measures needed not to secure blue carbon values of well documented blue carbon ecosystems
3. Map extent and quality of the carbon value of less well documented carbon ecosystems within current MPAs and implement relevant management measures
4. Designate new MPA based primarily on the carbon values for blue carbon ecosystems that lie outside existing MPAs rather than just focusing on traditional biodiversity value alone
5. Take measures to complement the MPAs using tool such as MSP and fisheries management to recognise, protect and best manage blue carbon across seascapes

Theme 3.2 Protection, restoration and creation outside MPA network

As mentioned in 2) Prioritisation, there have been some key habitats, species and threats to blue carbon habitats which have yet to be fully addressed within the marine environment, including muddy habitats, phytoplankton and kelp. Phytoplankton has the capacity to sequester 7.1Mt of carbon in deep water and sediments[57] through primarily diatoms and dinoflagellates (the latter responsible for 20% of global carbon sequestration[58]. Nationally kelp may account for 45% of primary production in UK coastal waters and 12% of the entire UK EEZ marine production internationally[59]. Inclusion of kelp within blue carbon habitats enables the benefit of upto 82% of subtidal and intertidal carbon becoming detritus and dissolved organic matter (DOM)[60]. However the To further develop these habitats, we must acknowledge their role and function in relation to carbon storage. In doing so, we can develop their functionality and how these can be efficient through established protection and restoration.

Referring to Action 4.1 - NIMTF would like to see DAERA outline the agreement process for setting out the selection criteria. We would also like to reiterate that along the same lines as *Action 2.6*, there seems to be a predetermined focus on saltmarsh and seagrass and would recommend this expands to include all associated blue carbon habitats and species, prioritising habitats with the greatest storage and sequestration rates. Due to the lack of mention of muddy habitats, phytoplankton and kelp in *Action 2.6*, there will be an underestimation of the selection criteria as vital habitats will have been otherwise excluded. This must also consider the interconnected matrix of the blue carbon seascape.

ACTION: Expansion of projects to be considered from *Action 2.6* to include all blue carbon habitats such as muddy habitats, phytoplankton and kelp and establish appropriate criteria and processes for the selection of projects including these habitats.

Referring to Action 4.2 - Without a benchmark to set a foundation of habitat recovery, we will not know what a 'fully restored' blue carbon habitat will look like. The definition of 'fully restored' must be defined before the implementation of restoration projects and the associated CSR of these. Again, NIMTF would recommend that the best way to achieve restoration is through the alleviation of

pressures and threats highlighted above through effective monitoring and management measures.

ACTION: Regulations must be considered and implemented in activities such as dredging and trawling to reduce the overall impact these have on blue carbon habitats. These must link to FMPs and the MPA Strategy Review.

Referring to Action 4.3 - Whilst a UK and Ireland Saltmarsh Handbook[61] does exist, there is no NI-specific Saltmarsh Handbook in operation. NIMTF would recommend learning to be adopted from the UK and Ireland-wide one to develop a local, regionalised Saltmarsh Handbook development. These lessons can be applied across the wider UK counterparts and in the transboundary areas aligned with the Republic of Ireland (RoI). NIMTF member WWT are helping to further develop the saltmarsh code within the existing Handbook.

ACTION: Development of an NI-specific Saltmarsh Handbook with links to transboundary areas to further collaborate with UK and RoI, which highlights lessons learned and with iterative updates to existing blue carbon codes.

Nationally, WWT are restoring 100,000 hectares[62] of wetlands across the UK, but this needs to be disseminated to what is being put in place here in NI outside of WWT Castle Espie as part of Strangford Lough; whilst WWF are aiming to restore 15% of the UK's seagrass meadows by 2030, with 18 hectares planted by 2026[63].

<u>Areas for creation of blue carbon habitats (All)</u>

Within the Action Table, it outlines the overarching goals and objectives for management, restoration and creation of habitats, but does not highlight what work will be needed in order to bring the above highlighted features into favourable condition. It is important that the actions outlined within this consultation are reflected within the MPA Strategy Review for blue carbon features in MPAs, but a framework must be formulated for features outside of the MPA Network too. It is important to understand that there are still numerous pressures facing blue carbon habitats as outlined in the earlier sections of this response. We need to alleviate the pressures facing them to give them a chance at achieving ocean recovery. Once this has been accomplished, we will provide a contribution to the UK's Greenhouse Gas Inventory.

An issue highlighted within our MPA Strategy Review response is that the offshore MPA features do not come into DAERA ownership until 2025/2026, meaning a delay in implementing measures to improve and maintain the condition of these features which relate to blue carbon reef features as designated under these offshore MPAs. As these habitats have the potential to mitigate the impacts of climate change, there needs to be a priority for reef-forming and large-scale habitats which help to remove the impact from storm surges, alongside the benefits of improving biodiversity which can improve Good Environmental Status (GES) to help meet statutory obligations.

ACTION: DAERA to work with DEFRA to manage offshore blue carbon Habitats as they move to devolved responsibility.

Inside and outside of MPAs, crucial blue carbon habitats and species will help act as NbS by drawing down carbon, whilst also providing tangible benefits to biodiversity and acting as a natural defence against increased storminess. A long-term programme of restoration must be put in place in NI to increase blue carbon habitats around NI, including seagrass meadows, maerl and saltmarsh. It is also vital, through NI's MPA strategy review, that DAERA develop recommendations for the establishment

of climate smart management of MPAs, which preserve natural blue carbon ecosystem functions and processes. For more details on the immediate actions needed to restore blue carbon habitats in NI please refer to NIMTF members UW's Blue Carbon feasibility report[54].

Blue carbon habitats support a number of different species which are currently being supported by blue carbon habitats. It is important to consider the potential knock-on effects through inaction and further decline on the condition of blue carbon habitats. The following are some of the current Condition Assessments, provided by DAERA for 2014 - 2019; of species which depend on saltmarsh and seagrass habitats:

Sea Pen & Burrowing Megafauna Communities - Queenie Corner MCZ - Unfavourable
Sea Pen & Burrowing Megafauna Communities - South Rigg MCZ - Unfavourable
Intertidal Honeycomb Worm Reef - Mournes Coast ASSI - Favourable
Light-bellied Brent Goose (*Branta bernicla*) - Carlingford marine pSPA - Not yet assessed
Light-bellied Brent Goose (*Branta bernicla*) - Killough Bay Ramsar and Killough Bay SPA- Unfavourable

4) Funding

NIMTF are aware of the limitations in available funding, especially those which are earmarked for the marine environment.

ACTION: Prioritise funding which contributes to the long-term management, restoration and creation of blue carbon habitats.

NIMTF have been advocating for long-term, sustained funding in order to continue monitoring programmes and welcomed the approval of the Marine Environment and Fisheries Fund (MEFF) to provide a year's worth of funding, of which blue carbon is a component. However, it comes with its own challenges in relation to delivery in such short timescales, alongside existing priorities and seasonality. Nature based solutions (NbS) can provide more sustainable, better value for money solutions, than traditional methods of adapting to climate change - e.g. hard infrastructure such as sea walls are increasingly costly and tend to pass the issues further down the tidal pathway[64]. In contrast, soft infrastructure helps to mitigate existing pressures that we see with climate change with less financial requirement, but an increased length of time to see results. However, further funding will be required to achieve the outcomes of the BCAP which surpasses currently available funding. Funding blue carbon actions should be considered in the wider societal strategy of public funding - not only through a lens of nature conservation but also as a strategic solution to mitigating the impacts of climate change on wider society.

It was noted that consistent monitoring and trials are required in an area where considerable potential for restoration exists but it can be challenging to finance and oversee such measures. For example, seagrass restoration requires monitoring every 2 months for up to 5 years.

Referring to Action 5.1 - NIMTF would like to see greater inclusion of the database hosted through NIEL membership across the nature and heritage sector to support marine conservation science, management, creation and restoration of blue carbon habitats and how this is transferable to other policy areas.

ACTION: A transparent record of the annual investment and outcomes for Blue Carbon Action from

both cross-departmental, private and other sources - published e.g. in the NI Climate Adaptation and Climate Action Plans reporting and/or within the Environmental Improvement Plan.

With the production of this record, who is responsible for holding and maintaining this database must be established and communicated effectively to relevant key stakeholders. The inclusion of a directory of multiple funding sources will be important, such as a mixture of private and public funding will be crucial here. To date, the use of public funding has not been applicable across different departments, such as infrastructure budgets being used for blue carbon habitat development in their role in tackling impacts such as sea level rise and storm surges. Given the ecosystem services we can derive from these blue carbon habitats, NIMTF would propose the opening up of cross-departmental funding to support innovative uses and proposals for the marine environment.

Referring to Action 5.2 - With a large number of organisations who will be involved in the development of the monitoring, projects, etc moving forward on blue carbon, it will be important to have a cumulative resource centre which can help to support not only the projects being taken forward, but to save duplication of resources in the future, as a centralised storage point. It is possible that the new Earth Hub with Keep Northern Ireland Beautiful (KNIB), or with Northern Ireland Environment Link (NIEL) overseeing a resource across all of the eNGOs moving forward; or even through Open Data NI[65] which is set up to share NI-wide data sets from within and beyond Government. However, given the capacity of environmental charities and the limitations on what data they are able to hold and access, there must be an oversight capacity for this built into existing government body frameworks.

5) <u>Governance</u>

Through the BCAP several actions, however no clear lead has been assigned to each action. Each action should outline who will lead the delivery to ensure overall objectives are achieved, to create a sense of ownership and achieve outcomes at a fast, transparent pace.

ACTION: All Objectives should be SMART and have a Clear Lead Identified.

It is crucial the BCAP outlines the importance of collaborative partnerships that will be required to deliver habitat restoration programmes. Funding for conservation projects is often competitive, sporadic and insecure, but working collaboratively can increase likelihood of securing funding as well as reducing the risk. Furthermore, large-scale habitat restoration is complex and requires a range of expertise (ecological, social science, policy). In Ulster Wildlifes 'Blue Carbon Feasibility Report' key partners for blue carbon restoration work are outlined in detail[54].

NIMTF member Friends of the Earth (FoE) stated "*The only way that environmental standards are maintained is if there are effective watchdogs and enforcement bodies. The difficulty is that those agencies don't exist or have been defunded or deprioritised.*" These comments are supported further by statements from Dr. Viviane Gravey, a politics lecturer and expert on EU environmental policy at Queen's University Belfast (QUB), who has stated "*There is all this potential for NI to be more ambitious than Great Britain but for that you need to have civil servants capable of doing the work and an environmental agency that has teeth. The civil service is under so much stress and there are so many gaps. Deadlines are being missed*[66]*."*

Within government departments there is a silo mentality, with environmental responsibility falling entirely under DAERA. This has resulted in further strain of department capacity and resources,

especially when addressing such a wide remit as the environment. Recent improvements with DAERA and DfE collaborating on OFW through the Offshore Renewable Energy Forum (OREF) and the Coastal Forum are evident as well as the Executives Draft Green Growth Strategy. Yet, to truly tackle marine environmental pressures and drivers, safeguarding NI's MPA network must be enshrined across each department's remit and priorities.

Referring to Action 5.3 - As established in *Actions 2.2 & 2.3*, the B&CWG remit and compromisation needs to be formally established, alongside evidence for "Carbon Credits" which have the potential to be beneficial, but also can come with concerns over greenwashing and limitations.

ACTION: NI policy guidance developed for Carbon Credits - including with reference to Blue Carbon.

Referring to Action 6.1 - A clear timeframe for integration and implementation of this Governance structure will must be established and outlined to ensure that incremental deadlines are met.

Referring to Action 6.2 - The development of a North-South Technical Working Group (N-STWG) would need to have representation from both NI and RoI. NIMTF would recommend that Fair Seas are approached and have representation for the eNGOs like representation from NIMTF would be beneficial for this. This would ensure that transboundary areas are covered whilst being inclusive of relevant organisations.

6) <u>Engagement and communication</u>

It is important to raise awareness of both the value blue carbon presents for climate mitigation, but also biodiversity gains, and adaptation, plus enhancement of other ecosystem services such as flood protection, water quality improvement to achieve proper community buy-in/ownership.

Societal awareness of blue carbon ecosystems and their importance is vital for restoration efforts to succeed. Management decisions and the approach to restoration require public support[54]. A better understanding of these factors within society is not only essential in terms of changing attitudes and behaviour in relation to environmental concerns, it can ultimately put pressure on governments to act. A need to understand interactions between the socio-economic and ecological elements of Blue Carbon systems: Within the scientific community, and within certain sectors of society who directly use or rely upon these ecosystems (e.g. coastal fishing communities). In order to achieve sustainable use of these habitats, and also to facilitate their restoration and recovery, Unsworth et al (2019)[67] emphasised the importance of recognising the interconnection between the social and the ecological system. They proposed that management frameworks needed to include humans (and their activities) as part of the ecosystem and that conservation goals needed to be embedded in a broad, multidimensional approach to achieving sustainability that took account of the communities using ecosystems.

Restoration of saltmarsh through managed realignment seems the most valuable coastal blue carbon initiative in terms of quick impact. Still, it comes at a high cost due to land prices, coastal access etc. To overcome this, restoration practitioners must have good community negotiations. Furthermore, the infrastructure is visible and of public interest, and reclamation of land for restoration can be seen as loss of agricultural land, reaffirming that community engagement and education is vital. There is an opportunity to demonstrate the ecological and economic benefits of using land in this way which should include sea defence renewal costs and be incorporated into any decision making on where and when managed realignment of salt marsh should be selected[54].

It is therefore crucial that DAERA and other marine stakeholders raise public awareness of blue carbon as a nature-based solution to climate change.

Referring to Actions 7.1 / 7.2 - See previous comments for *Actions 1.5 and associated* ***ACTIONS*** *included, but reiterated here.*

ACTION: DAERA develops and implements a communication Strategy tracking the impact (qualitative and quantitative) of differing communication methods demonstrating effective communication which increase a) awareness b) capacity to support/implement the blue carbon action plan c) influence change over a variety of timescales.

ACTION: With reference to Story Maps and a Communication Strategy, this must be co-designed with media, educational and communication experts and to outline a comms strategy that requires focus groups from specific, intended audiences.

Community Involvement

Ulster Wildlife hosted a virtual Blue Carbon workshop on the 17th February 2021 and was attended by 84 representatives from NGOs, academic institutions, government agencies and local councils. It was evident from the workshop that partnership working is essential for habitat restoration programmes in order to access the expertise, funding and resources required for success[54]. RSPB convened a Nature-based Solutions workshop in May 2024 which highlighted that there needs to be work carried out across departmental bodies to ensure that we are achieving recovery of species and habitats through all interactions with the marine environment.

A number of projects have been set up across the UK where the community has been involved, improving educational awareness, but also engagement with the importance of blue carbon habitats - e.g. Project Seagrass and Restoration Forth (Scotland)[51]. The inclusion of communities in such projects maintains a vital connection to coastal communities who are the most at risk to the impacts of climate change. By offering the ability to get involved, there are numerous opportunities for upskilling, educational awareness and advocacy - where a sense of ownership can be built as has been seen through communities at Islandmagee[68] and Whitehead[69]. This can be further developed through the PeacePlus[70] proposals and the development of a localised version of (Restoring Meadows, Marshes and Reefs) ReMeMaRe[71] - usually hosted in Scarborough.

Conclusion

The benefits of protecting, restoring and creating blue carbon habitats is a win-win for both climate and nature. Blue carbon is a 'triple value' climate solution, simultaneously offering benefits in climate change mitigation, adaptation and resilience. As a climate action, protection and restoration of blue carbon ecosystems offers a high return on investment across a variety of human and natural impacts. Furthermore, many coastal blue carbon habitats provide a range of important co-benefits, or 'ecosystem services', such as being of high biodiversity value, as fish nursery grounds, by improving water quality (e.g. shellfish beds) and as coastal flood protection/erosion resilience. Such co-benefits become increasingly important as climate change exerts pressures on coastal areas.

The preservation of habitats through the removal of anthropogenic pressures such as pollution, mooring or fishing can be a highly efficient approach and must be considered alongside the creation of new blue carbon habitats in places they are currently not existing, and the restoration of current

habitats. And while there are limitations to blue carbon habitat data there must be a balance between gaining evidence while also putting protection in place to prevent further habitat degradation.

Vital now this BCAP is cross-cutting and will underpin action to protect, restore, create and monitor blue carbon habitats, with priority given to protection and restoration of existing habitats.

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