



Action for Blue Carbon: Protecting the marine environment to support action on climate change

An updated briefing from SCCS; March 2025

Summary

“Blue carbon “ is the term that is used to collectively refer to carbon stored in and/or sequestered by the sea and marine environments. Scotland's blue carbon environments store 9,636 MtCO₂-eq and sequester 28.4 MtCO₂-eq per year. This store is roughly equivalent to the total carbon stored in Scotland's land-based ecosystems and Scotland's seabed habitats could capture up to 9.5 million tonnes of organic carbon every year, which is over four times the amount sequestered by Scottish forests (2.07 million tonnes). Adding emissions related to activities at sea, the wider 'marine carbon' balance is, therefore, vital to efforts to address climate change.

Scotland's seas are, environmentally, in a poor condition – and we are failing to meet our obligations for their restoration. A new series of reports published in 2024¹ revealed 152 million tonnes of organic carbon are stored in just the top 10cm of seabed sediments – principally made of mud – in Scotland's seas. Action to address marine carbon issues can also address the poor environmental condition of our seas – and vice versa. It is a potential win-win.

At present, neither blue carbon nor some aspects of the wider marine emissions are included in the UN's greenhouse inventories. This means that they are not measured or reported in Scotland's annual emissions' report or addressed in the Climate Change Plan.

Nevertheless, blue carbon (and its release, storage and sequestration) will affect the climate whether it is 'counted' in the inventory or not. Not addressing blue carbon is delaying action that will, one day, be 'counted' and makes meeting the Paris target all the harder.

The new Climate Change Plan now due for publication in 2025 should not only refer to blue carbon and ongoing research but also include clear and specific actions to protect carbon stores and promote environmental improvements that will increase sequestration rates.

In addition to a substantial marine section in the new CCP, the Blue Carbon Action Plan, which was announced by the Scottish Government in 2023 and is currently due to be published in 2025 presents an opportunity for the introduction of marine climate change mitigation policies. The Plan must continue to support blue carbon research and monitoring. It should also implement a range of 'no regret' actions to protect from disturbance the most vulnerable stores of blue carbon - especially in west coast sea lochs where large quantities of the highly reactive organic carbon are stored, through fishing policy reform, improved management of MPAs, coordinated terrestrial and coastal management and seaweed protection/cultivation.

What is Blue Carbon?

“Blue carbon “ is the term that is used to collectively refer to carbon stored in and/or sequestered by the sea and marine environments. It includes CO₂ and other GHGs dissolved in the oceans, carbon 'locked up' in organic and inorganic sediments, and carbon within living plants and animals (which, on dying, go on to add to the organic and inorganic sediments).

¹ <https://www.wildlifetrusts.org/sites/default/files/2024-09/Scotland%20-%20technical%20summary%20-%283%29.pdf>



Speaking at the Blue Carbon Conference, in Edinburgh in November 2021, Cabinet Secretary for Rural Affairs, Mairi Gougeon MSP, said:

“There is increasing recognition across the international community of the role of the carbon stored in our seas and ocean for enhancing action on climate change mitigation, adaptation and resilience.”²

To this ‘natural’ blue carbon, which itself is significantly affected by human activities (and, in turn, influenced by policy decisions), must be added the direct emissions from activities at sea (fishing, shipping, etc).

In August 2022, SCCS published [a briefing on Blue Carbon](#) and the actions considered necessary to both better understand its scale and importance and to protect and enhance its contribution to climate action. This briefing replaces and updates that earlier version.

Scotland’s blue carbon resource – a key feature of our marine environment

A SPICe briefing³ on blue carbon summarised the current data available on the total extent of this resource in Scotland as:

- “Collectively, Scotland’s blue carbon environments store 9,636 MtCO₂-eq (Megatonnes of CO₂-equivalent). This is roughly equivalent to the total of carbon stored in Scotland’s land-based ecosystems (9,546 MtCO₂-eq) such as peatlands, forestry and soils.
- Annually, Scotland’s blue carbon stores sequester 28.4 MtCO₂-eq, which is approximately three times greater than the annual carbon sequestration of Scottish Forestry (9.6-11 MtCO₂-eq per year).”

These headline figures, which reflect the data in the Scottish Government’s “Compendium of Marine Related Carbon Stores, Sequestrations and Emissions⁴) are based on detailed reports commissioned by Scottish Natural Heritage (SNH, now known as NatureScot) as well as papers by a research team at Heriot-Watt University⁵.

A more recent analysis⁶ has been undertaken by the Scottish Association for Marine Science (SAMS), The University of St Andrews, and the Marine Biological Association (MBA). This was written and edited by Professor Dan Laffoley and Professor John M Baxter, WWF, The Wildlife Trusts, and the RSPB. This study concluded there is an estimated 152.3 million tonnes (Mt) of organic carbon in long-term stores in Scotland’s marine area, with 99.7% of that total (an estimated 151.8 Mt of organic carbon) and 1,020.7 Mt of inorganic carbon found in the just the top 10 cm of sublittoral mud and sand/mud seabed sediments. This estimate therefore represents only a fraction of the overall carbon stored in the full thickness of these sediments. In addition, there is an estimated 368,000t of organic carbon stored in the top 10 cm of soils in coastal saltmarshes and 32,000t of organic carbon in seagrass bed sediments; while living kelp biomass contains an estimated 1,042,000t organic carbon with a further 50,000t contained in intertidal macroalgae.

This study also found that Scotland’s seabed habitats could capture up to 9.5 million tonnes of organic carbon every year, which is over four times the amount sequestered by Scottish forests (2.07 million tonnes)⁷ although forests cover a much smaller area (15,110 km²).

² <https://www.gov.scot/news/blue-carbon-international-policy-challenge/>

³

<https://digitalpublications.parliament.scot/ResearchBriefings/Report/2021/3/23/e8e93b3e-08b5-4209-8160-0b146bafec9d#Executive-Summary>

⁴ <https://data.marine.gov.scot/sites/default/files/SMFS%201101.pdf>

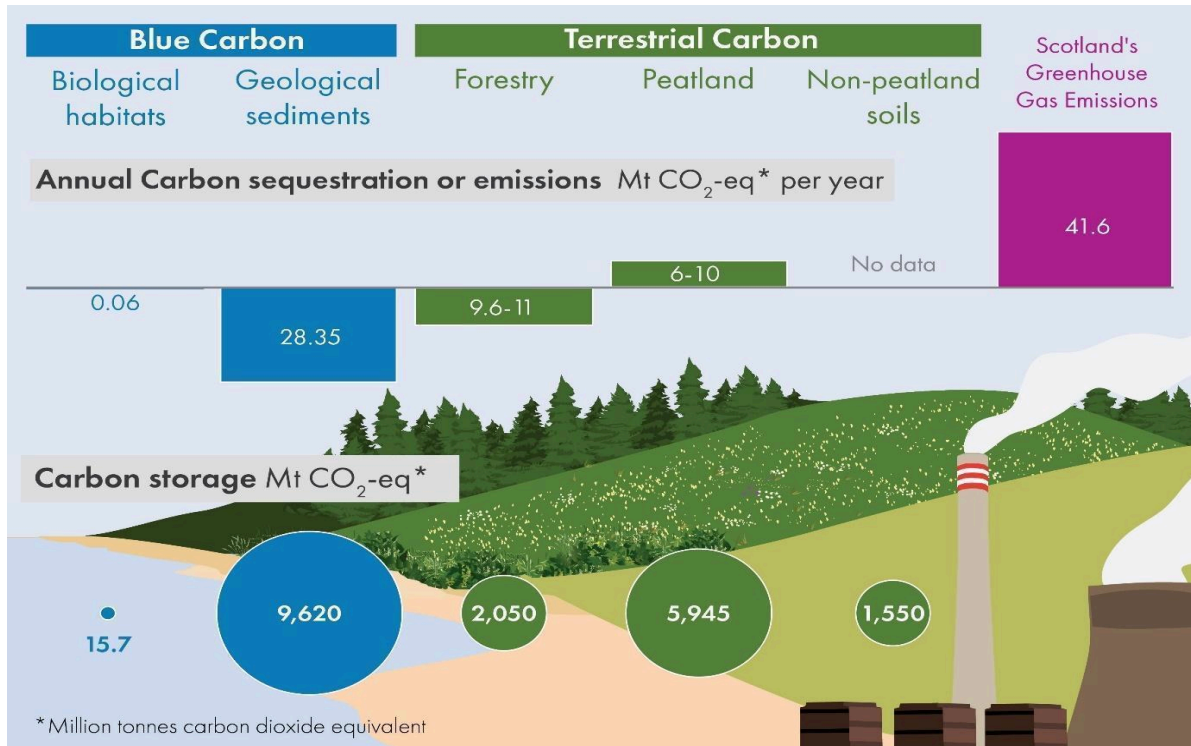
⁵ The SNH reports are Burrows et al. (2014) and Burrows et al. (2017); the Heriot-Watt University papers are Smeaton et al. (2016 and 2017) – see references section for full citation and links.

⁶ <https://www.wildlifetrusts.org/sites/default/files/2024-09/Scotland%20-%20technical%20summary%20%283%29.pdf>

⁷ https://cdn.forestresearch.gov.uk/2022/09/Ch4_Carbon_2022.pdf



Comparison of blue carbon storage and sequestration with terrestrial carbon, and Scotland's greenhouse gas emissions⁸.



Data on the extent of blue carbon stores, as well as sequestration and emission rates, are rapidly improving. As mentioned above, a series of reports as part of the Blue Carbon Mapping Project, were completed in 2024 by the Scottish Association for Marine Science (SAMS) on behalf of WWF-UK, The Wildlife Trusts and the RSPB⁹. These reports mean the UK became the first nation to map and estimate the amount of carbon stored in its seabed habitats, including within Marine Protected Areas (MPAs). These findings show that Scotland has almost two thirds of the UK's blue carbon and 50% of this carbon is stored in Marine Protected Areas.

Notwithstanding the rapidly improving scientific knowledge, Laffoley (2020) concluded that **“the importance of maintaining the integrity of carbon storage in marine soils, sediments and vegetation (preventing carbon dioxide release) is not in doubt”** – while also highlighting the many knowledge gaps, especially in relation to quantification of carbon flows. This need to protect marine carbon was recognised by SNH, in its 2019 climate change commitments, which included:

*“We will further develop policy and practice on maintaining and enhancing the carbon storage capacity of marine habitats, using Marine Protected Areas as pilots and exemplars”.*¹⁰

The importance of Scotland's blue carbon resource to both Scotland and the wider UK's effort to address climate is underlined by both its extent and its current state. Scotland's marine area accounts for over 60% of the UK's seas; they extend to over six times our terrestrial land mass.

⁸ Illustration from <https://digitalpublications.parliament.scot/ResearchBriefings/Report/2021/3/23/e8e93b3e-08b5-4209-8160-0b146bafec9d#8b1bb7dd-2090-4586-ac72-b02fbb5a068a.dita>

⁹ <https://www.wildlifetrusts.org/sites/default/files/2024-09/Scotland%20-%20technical%20summary%20%283%29.pdf>

¹⁰ <https://www.nature.scot/sites/default/files/2019-10/Publication%202019%20-%20SNH%27s%20Climate%20Change%20Commitments%202019.pdf>



Our marine environment is undoubtedly impressive but, looking closely, shows that not all is what it seems. The pressures facing marine life are not all fully understood but we do know that these ecosystems are fragile and under increasing stress from human activities.

The EU's Marine Strategy Framework Directive (MSFD)¹¹, adopted in 2008 and incorporated into UK law in 2010¹², aims to improve the state of Europe's marine environment. It includes an ambition to achieve "Good Environmental Status" of the seas – and member states and the EU Commission have developed a set of indicators to measure the achievement (or not) of that status. Yet, despite the UK and Scottish Governments claiming a "mixed picture"; 11 out of the 15 indicator targets were missed in the last (2019) assessment¹³. A similar picture of failure to achieve environmental ambition is set out in the 2020 Scottish Marine Assessment¹⁴. This poor environmental condition is also reflected in the state of the north-east Atlantic generally¹⁵.

Action to address marine carbon issues can also address this poor environmental condition of our seas – and vice versa. It is a potential win-win.

The UN inventory and blue carbon

At present, neither blue carbon nor many of the wider marine emissions are included in the UN's greenhouse inventories¹⁶ used for reporting and for determining national contributions. This means that they are not measured or reported in Scotland's annual emissions' report or addressed in the Climate Change Plan that delivers policies to deliver emission reduction targets.

This is a recognised shortcoming, and work is underway to address it. The UN has agreed a definition of "all biologically-driven carbon fluxes and storage in marine systems that are amenable to management" and in 2019 a special report on the oceans was published¹⁷. Despite their importance, clearly demonstrated by the recent Blue Carbon Mapping Project¹⁸, these blue carbon concepts are not yet uniformly incorporated into climate strategies on local, national and global scales. Yet, as research continues and understanding grows, that is clearly the direction of travel¹⁹.

In the short-term, it is likely that carbon stores/flows associated with saltmarshes/seagrasses (albeit a small subset of the overall blue carbon) will be added to the inventory in the next 2-3 years. While this is certainly a small proportion of overall blue carbon, it is important that this action, and other wetland restoration is undertaken – to drive forward further inclusion of blue carbon sources and action on those. In addition, given the results of the recent blue carbon mapping reports, demonstrating the carbon content of deep sea mud/mud sediments, these habitats should be considered for protection.

Longer-term, it is vital that as much of the blue carbon stores and flows will be added as soon as possible. **SCCS strongly supports the inclusion of blue carbon, and emissions from marine industries, in the inventory and the Climate Change Plan. In the short-term, emissions from, and action to protect and enhance saltmarshes/seagrasses, should be added immediately.**

¹¹ https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

¹² <https://www.legislation.gov.uk/ukxi/2010/1627/made>

¹³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/921262/marine-strategy-part1-october19.pdf

¹⁴ <https://marine.gov.scot/sma/>

¹⁵ <https://www.sciencedirect.com/science/article/pii/S1470160X22006203>

¹⁶ <https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc/ghg-data-from-unfccc>

¹⁷ <https://www.ipcc.ch/srocc/>

¹⁸ <https://www.wildlifetrusts.org/sites/default/files/2024-09/Scotland%20-%20technical%20summary%20%283%29.pdf>

¹⁹ <https://www.frontiersin.org/articles/10.3389/fclim.2021.710546/full>



Scotland's blue carbon – acting irrespective of inventory status

During Parliamentary scrutiny of the Climate Change Plan update (CCPu) in 2021, the then Cabinet Secretary confirmed the above position, stating that:

“Blue carbon is not currently included in the UK greenhouse gas inventory. That means that policies and proposals in that space could not contribute to progress to meeting Scotland’s statutory emissions targets, which in turn means that, of necessity, they fall outside the formal scope of the climate change plan update”²⁰.

She added that Scottish Government officials are also working with UK counterparts on developing the evidence base to support including two blue carbon habitats (saltmarsh and seagrass) within the UK emissions inventory as soon as it is appropriate to do so, while highlighting that those decisions on technical changes to the UK inventory are, however, made solely by the UK Government.

Nevertheless, blue carbon (and its release, store or sequestration) will affect the climate whether it is ‘counted’ in the inventory or not. While ‘meeting our targets’ is linked to emissions reductions from sectors included in the inventory, achieving a stabilisation of the temperature rise (to below 1.5°C if the “Paris aspiration” is to be met) is, in fact, linked to emissions whether ‘counted’ against inventory or not. Thus, not addressing blue carbon is delaying action that will, one day, be ‘counted’ and makes meeting the Paris target all the harder.

Acting now on blue carbon would allow Scotland to get ahead of the game and become a genuine ‘world leader’, able to help advise and influence global thinking on this issue. Such action would also contribute to nature restoration at sea (helping us meet wider environmental aspirations), as well as help support the Just Transition of marine industries.

Notwithstanding the then Cabinet Secretary’s perspective, the then Environment, Climate Change and Land Reform Committee (ECCLR) drew attention to the lack of policies and proposals relating to the protection of blue carbon in the CCPu. The ECCLR committee heard evidence from a range of stakeholders as well as on the latest research. This scrutiny process led to the ECCLR Committee concluding that:

*“The Committee continues to be of the view that **CCPs, including the CCPu, should contain policies and proposals on blue carbon.** Whilst emissions reductions from blue carbon are not currently included in the GHG inventory, it is clear that **practical action to protect carbon stores in the marine environment is important to ensure the continued contribution of marine ecosystems in reaching net-zero.** It would appear to the Committee that acting on the basis of the precautionary principle, **taking a proactive approach to blue carbon and including it as part of the final CCPu would ensure that Scotland makes early advances and secures multiple benefits in terms of carbon storage, securing biodiversity and supporting adaptation and resilience, in many areas though relatively simple, low cost actions.** The Committee is of the view that this would avoid mitigation by numbers and ensure a coordinated approach – as is proposed in the draft CCPu” (emphases added)²¹.*

This approach is one that SCCS continues to support – and it is disappointing that the Scottish Government did not act on this recommendation. The CCPu was finalised, in part because of the then pending dissolution of Parliament and election, with none of the recommended amendments being made.

Now, the Scottish Government is developing the successor Climate Change Plan and decisions are imminent in relation to the scope of that plan. SCCS has made submissions to the Scottish Government that the scope should be broad and include a range of non-statutory issues, including

²⁰ <https://archive2021.parliament.scot/parliamentarybusiness/report.aspx?r=13124>

²¹ https://archive2021.parliament.scot/S5_Environment/Reports/ECCLR_2021.03.04_OUT_CS_CCPu_Report.pdf (page 36-37)



blue carbon²². Given the importance of blue carbon, described above, and the recommendations of the former ECCLR Committee, SCCS strongly recommends that **the new Climate Change Plan should not only refer to blue carbon and ongoing research, but also include clear and specific actions to protect such carbon stores, and environmental improvements that will increase sequestration rates.**

Scotland's Blue Carbon Action Programme

In its 2023 Programme for Government, the Scottish Government's committed to “develop a *Blue Carbon Action Plan to improve the management, protection and enhancement of Scotland's critical blue carbon environments*”²³. Whilst the BCAP was not published by its initial 2024 publication deadline, SCCS understands that it will be published in 2025 and urges that it focuses on both continuing research and on action to protect key areas of vulnerable carbon sequestered in areas of inshore marine sediment. The importance of taking action, especially in relation to fisheries management is highlighted by the extract below from Martin *et al* (2022).

“Where trawling gear interacts with marine sediments, it can introduce oxygen into sub-surface sediment layers, increasing the potential loss of buried carbon through aerobic remineralisation. (Aller, 1994.; Hulthe, 1998) Sediment type is an important factor in the storage of sedimentary organic carbon (OC) (Diesing, 2017; Smeaton, 2021), where OC is largely controlled by the proportion of clay or mud (Hedges, 1995). Trawling has a larger physical impact on muddy-sediment environments in terms of resuspension, causing significantly higher volumes of OC to be resuspended compared to sandy-bottom environments (O'Neill, 2011), with implications for both carbon flux and the resilience of local biodiversity (Pusceddu, 2014; Paradis, 2017). There is currently a lack of comprehensive evidence to fully demonstrate the effects of trawling on sedimentary OC stocks, but one likely outcome of regular trawling is prevention of sediment settling processes and, in turn, localised carbon sequestration (Epstein, 2022; Oberle, 2016). Furthermore, using the definition outlined in Scheffold and Hense 2020, fish populations are living pools containing stocks of OC. In addition to affecting OC stocks in sediments, by removing fish biomass, fishing activity may prevent OC from sinking in the form of fish carcasses and facilitate conversion of OC in biomass to atmospheric CO₂ (Mariani, 2020).”

[Quote from: Martin et al, 2022 Exploring Changes in Fishery Emissions and Organic Carbon Impacts Associated With a Recovering Stock²⁴.]

Recommendations for action

SCCS' marine group has previously (January 2020) submitted proposals for action. These both reflect and have been built on by subsequent proposals, including those by Laffoley (2020), the ECCLR Committee in the last Parliament (March 2021) and a Scottish Government review of fisheries policies in relation to climate change policies²⁵ (July 2022). These ideas are set out in full in annex 1, and based on these ideas, SCCS calls for: -

²²

<https://www.stopclimatechaos.scot/wp-content/uploads/2022/08/CCP-scope-one-sider-from-SCCS-1-Mar-2022-FINAL.docx-2.pdf>

²³

<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/09/programme-government-2023-24/documents/equality-opportunity-community-programme-government/equality-opportunity-community-programme-goverment/govscot%3Adocument/equality-opportunity-community-programme-government.pdf>

²⁴ <https://research.wur.nl/en/publications/exploring-changes-in-fishery-emissions-and-organic-carbon-impacts>

²⁵

<https://www.gov.scot/publications/review-fishing-practices-adapted-commercial-fisheries-around-world-order-help-mitigate-sectors-contribution-climate-change/pages/1/>



1. Research

There is a considerable amount of blue carbon research being undertaken through the Scottish Government's Blue Carbon Forum²⁶. This includes recent research²⁷ which shows that organic matter in coastal sediments can be highly reactive and potentially unusually vulnerable to break down when disturbed. In addition, there is growing research evidence showing that Scotland's Atlantic coastal sediments contain some of the UK's largest stores of such vulnerable and labile carbon.²⁸

"We estimate the sedimentary OC stores on the west coast of Scotland to be amongst the most vulnerable areas of the seabed within the UK EEZ" (Black *et al*, 2022²⁹).

The ongoing research programme should be supplemented by additional research undertaken as part of the forthcoming Blue Carbon Action Plan. A clear research priority must be to establish more precisely how, if disturbed, organic carbon in seafloor sediments is converted to carbon dioxide, and what portion is lost to the atmosphere, where it may contribute to climate change. Another research area must be to assess fishery impacts on OC in sediments and biomass, building on analysis conducted by Martin *et al* (2022) into the potential for lowering emissions intensity and impacts on organic carbon stocks in the hake fishery³⁰.

2. Mapping

To aid further policy development, it is important that the Scottish Government urgently utilises the research already undertaken and modelling developed in conjunction with the Blue Carbon Forum to publish high resolution and comprehensive maps of Scotland's blue carbon stores. Whilst low granularity maps have been published for the UK EEZ (Smeaton *et al*, 2021), there is a need for higher granularity mapping to support the designation of protected areas. This would, in particular, inform the detailed selection and management objectives of protected areas and associated fisheries management measures (see below).

The need for such an understanding (and then appropriate management action) is illustrated by recent research that concludes that blue carbon "hotspots are potentially at risk of disturbance from bottom trawling activity and should be prioritised for the consideration of future safeguarding (management) measures to ensure emissions are minimised and to provide greater protection of this natural carbon capital resource"³¹.

3. Actions to protect and enhance blue carbon

Whilst SCCS recognises the need for further research into the fate of organic carbon disturbed, in particular, by seabed bottom trawls, this should not be used as a reason not to take precautionary action to protect blue carbon stores.

Specifically, there is an urgent need to implement management measures which protect the most vulnerable inshore sediments where labile organic carbon rich muddy sediments dominate, and disturbance by trawls is possible. Typically, this includes the heads of many of Scotland's fjordal sea lochs.

Other action measures should include:

²⁶ <https://www.bluecarbon.scot/the-forum>

²⁷ Smeaton, C., & Austin, W. E. N. (2022). Quality not quantity: Prioritizing the management of sedimentary organic matter across continental shelf seas. *Geophysical Research Letters*, 49, e2021GL097481. <https://doi.org/10.1029/2021GL097481>

²⁸ <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.892892/full>

²⁹ <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.892892/full>

³⁰ <https://research.wur.nl/en/publications/exploring-changes-in-fishery-emissions-and-organic-carbon-impacts>

³¹ <https://www.frontiersin.org/articles/10.3389/fmars.2022.892892/full>



(a) Fishing reform

The relationship between climate change and fisheries is crucial – and is not restricted to the impact that benthos impacting mobile gears may have on sediments. Also important are emissions from fishing vessels - which can potentially be reduced by replacing diesel engines with electric motors, the removal of fuel subsidies, and by the introduction of fisheries management measures to reduce steaming distance to fishing grounds and restore fish stocks and the wider marine environment, as well as changes to vessel and fishing gear designs.

The introduction of the Scottish Government's Inshore Fisheries Management Improvement programme in 2025 presents a vehicle to deliver such a clear change of direction in relation to inshore fishing policy –and builds on earlier proposals set out by SCCS in its response to the Future Catching Policy Consultation³². Further detailed policy measures should be set out in both IFMI and the new CCP. These plans should also set out how the Scottish Government will support a just transition for the fishing industry.

(b) MPA management

Marine Protected Areas provide a vehicle to implement and monitor management measures for blue carbon – which also deliver for the wider marine environment. The ongoing process of introducing management measures to MPAs in both offshore and inshore areas must build on the proposals in the former Bute House Agreement and include the protection of blue carbon as an objective. In particular, the Scottish Government should:

- Ensure that all MPAs are protected from destructive activities that damage blue carbon habitats and threaten marine life.
- Account for both carbon and biodiversity in designating new protected areas, to support ecosystem resilience and the role seas play in climate mitigation.
- Adopt a site wide approach to managing damaging fishing activity across the offshore MPAs that are currently subject to consultation.

While actions for Marine Protected Areas are important, there must also be management measures introduced to protect blue carbon habitats (including saltmarshes and seagrasses) irrespective of whether they are located within designated MPAs.

(c) Coastal, seaweed and other policies

Given the growing evidence of the important role of terrestrial management on inshore deposits of carbon (via runoff of soil /peat), there is a need to develop and implement better integrated coastal management, spanning the land-sea boundaries – and for this to be reflected in terrestrial land use policies.

The Government should also develop a coherent seaweed regulatory framework covering both protection of wild stocks and sustainable cultivation. Recent evidence raises questions about the ability of cultivated seaweed to sequester carbon in significant quantities and implies that policy may have to rely more on natural growth³³. However, it is recognised that farmed kelp may enable a new generation of climate mitigating products (e.g., methane reduction feedstuff additives).

4. A substantial marine section in the CCP, supported by enhanced funding

As described above, the new Climate Change Plan should not only refer to blue carbon and ongoing research but also include clear and specific actions to protect such carbon stores, and for environmental improvements that will increase sequestration rates. The CCP, and the new National Marine Plan, must improve the strategic planning of activities in Scotland's seas so that no damaging

³²

<https://www.stopclimatechaos.scot/wp-content/uploads/2022/06/SCCS-response-to-consultation-on-Future-Catching-Policy-1-1.pdf>

³³ <https://cdn.cyfoethnaturiol.cymru/media/695110/nrw-evidence-report-606-seaweed-farming-and-blue-carbon.pdf>



activities in MPAs and other key areas for blue carbon and wildlife are permitted. Such a policy will require undertaking blue carbon impact assessments.

To deliver the above, the Scottish Government will need to allocate more investment to research and to actions to protect blue carbon; this will need to include:

- Allocating funding to restore habitats including seagrass beds and saltmarshes.
- Supporting research and monitoring of blue carbon dynamics.
- Adding seagrass and saltmarsh to the Greenhouse Gas Registry to track and monitor emissions.

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ANNEX 1

Various proposals for action to protect and enhance blue carbon

Policy asks from SCCS marine group, submitted to Scottish Government in January 2020:

- Halt impacts on existing marine carbon stores by establishing appropriate spatial management
- All marine activities having an impact on marine carbon stores to be monitored and high resolution maps of the footprint made available publicly and annually
- Cease damage to all biogenic reefs, seagrass, kelp and other habitats which sequesterate carbon, and establish regeneration targets for each
- Cease damage to saltmarsh habitats and establish regeneration targets
- Establish low emission and sustainable fisheries objectives in fishery legislation and report on annual fisheries emissions
- Recover fish stocks to the point at which they can provide maximum sustainable yield to provide low emission protein source
- Improve terrestrial coastal land management
- Establish financial instruments to promote emissions reduction
- Promote research into carbon sequestration in aquaculture

Laffoley (2020) recommendations for action:

- Recognise the full extent of blue carbon ecosystems present in MPAs as the basis for initiating climate/biodiversity joined up and effective management action.
- Take additional management measures straight away to secure the carbon values of well-documented blue carbon ecosystems.
- Take additional management measures to secure the carbon values of less well-documented blue carbon ecosystems, which may need to include mapping their extent and quality within current MPAs before enacting relevant management measures.
- Designate new MPAs based primarily on the carbon values for blue carbon ecosystems that lie outside existing MPAs, rather than just focusing on traditional biodiversity values alone. This step can be enacted alongside any other step and as early as resources allow as a key element of delivering the CBD's existing (Aichi) and future biodiversity targets.
- Take measures to complement the MPAs using tools such as marine spatial planning and fisheries management measures to recognise, protect and enhance and restore blue carbon across seascapes.

The ECCLR Committee (March 2021) went on to recommend that the Scottish Government:

1. Brings forward policies on how to protect blue carbon stores through the forthcoming update of the National Marine Plan and the development of the Blue Economy Action Plan and reflects this intention in the final CCPu.
2. Provides clear guidance on the role of spatial management in protecting blue carbon hotspots from pressures such as mobile bottom-contacting fishing gear.
3. Ensures that blue carbon storage and sequestration capacity is taken into account in proposals for management measures in Marine Protected Areas.
4. Provides further information on how it will ensure that the Blue Economy Action Plan reconciles the need to ensure protection of natural capital such as blue carbon and marine biodiversity hotspots with socioeconomic priorities of coastal communities.
5. Works with the UK Department for Business, Energy and Industrial Strategy to incorporate blue carbon in saltmarsh and seagrass ecosystems into the UK's National Atmospheric Emissions Inventory and therefore Scotland's greenhouse gas inventories.
6. Takes a leadership role in promoting the opportunities of blue carbon and presses for the inclusion of blue carbon in the GHG inventory, including with the UK Government and in the COP26 negotiations.



A Scottish Government review of fisheries policies³⁴ in relation to climate change policies, published in July 2022, identified a number of options for policy interventions grouped into in eight areas:

1. **Fossil fuel consumption**; efforts to reduce consumption and associated greenhouse gas (GHG) emission from fishing vessels.
2. **Alternative energy**; Cleaner energy supply for fish and shellfish processing.
3. **Selectivity**; the use of more selective and efficient methods of fishing.
4. **Local Markets**; better use of local markets, reducing food miles and associated GHG emissions.
5. **Reducing waste**; efforts to reduce waste/gear loss, thereby reducing marine litter and GHG emissions.
6. **Refrigerants**; measures taken to reduce the contribution of refrigerants to GHG emissions.
7. **Stock resilience**; measures to improve stock resilience to climate change.
8. **Consumer behaviour**; efforts to change consumer behaviour.

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<https://www.gov.scot/publications/review-fishing-practices-adapted-commercial-fisheries-around-world-order-help-mitigate-sectors-contribution-climate-change/pages/1/>