

Pwyllgor Newid Hinsawdd, yr Amgylchedd a Seilwaith /
Climate Change, Environment and Infrastructure Committee
Rheoli'r amgylchedd morol / Marine environment management
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Ymateb gan Dr Richard Unsworth, Athro Cyswllt mewn Bioleg Forol - Prifysgol
Abertawe, a Chyfarwyddwr - Project Seagrass /

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Evidence paper: Blue Carbon potential and developments in Wales

Evidence paper to help inform the Welsh Government Climate
Change, Environment, and Infrastructure Committee's meeting
on 9th December 2021.

Submitted by Dr Richard Unsworth, Associate Professor of Marine Biology at Swansea
University and Director of the Wales based global marine conservation charity Project
Seagrass. The views expressed here, whilst gained through my experience whilst working
for Swansea University are my own and not on behalf of Swansea University, however they
do also reflect the views of Project Seagrass.

Background

- Seagrass meadows are subtidal (underwater) and intertidal (beach) habitats comprised of plants adapted to life in the ocean. These sensitive plants and the meadows they create provide many important functions supporting coastal livelihoods. They support fisheries through provision of fish nursery areas, they enhance biodiversity, they protect our coastlines, and importantly they store and lock up carbon into marine sediments.
- Blue carbon is simply the term for carbon captured by the world's ocean and coastal ecosystems and therefore in Wales, habitats such as Seagrass Meadows, Salt Marshes and Kelp Forests are considered blue carbon habitats.
- I am a member of the UK Blue Carbon working group, have published academic articles about Blue Carbon, and I am an accepted authority on the biology and ecology of seagrass meadows and their conservation and restoration. This includes publication of over 100 academic articles on the subject from studies in the UK and globally. I led the UK's first seagrass restoration project based in Dale (Pembrokeshire) that is now showing signs of success.
- There is good evidence globally and in the UK that organic carbon can be stored in high quantities within so called Blue Carbon habitats. Healthy seagrass meadows will lock up vast amounts of carbon each year. But this storage is context specific not habitat specific. For example, value in seagrass or salt marsh vary significantly

between sites and may depend on the anthropogenic, biological, physical and environmental conditions.

- Many Blue Carbon summary reports have been written about the potential of these resources to contribute to the UK and to the Welsh commitments to achieving net zero and becoming included into future Nationally determined Contributions (NDCs). Although these reports are well constructed, the very data that underpins them is largely insufficient. We have some data on Blue Carbon storage and sequestration in Wales but data is grossly inadequate.
- The coverage of seagrass in Wales is likely a fragment of its historic extent. Scant records provide some evidence of this but two factors are important to consider:
 - Wales has decimated its coastline and arguably removed vast areas that would have once been carpeted with Blue Carbon habitats. As the worlds first industrialised nation we ripped apart our coastal bays, estuaries, inlets and sheltered waters to build ports, harbours, processing plants, and create towns and cities for industry workers.
 - As part of this industrialisation we also led the world in metal mining, an industry that developed over thousands of years. The real impacts of this mining activity will never truly be known, but we do know that still to this day metals still flow and contaminate catchments throughout Wales. These heavy metals are well established to be toxic to seagrass.
- Seagrass in Wales in some locations has expanded in coverage in the last decade, however noticeable declines in seagrass condition and area have occurred and still are occurring with limited action to halt or reverse the loss. A major seagrass meadow disappeared close to Llanrhidian marshes in the Burry Inlet with limited consideration from NRW for the causation other than to indicate that “the site wasn’t suitable for seagrass”. An extensive seagrass meadow at Littlewick in the Milford Haven Waterway has declined over the last 30 years due to poor water quality with limited consideration of measures to remedy the problem.
- Restoration of seagrasses and other marine habitats create a huge opportunity for contributing towards carbon capture and brings with it huge potential co-benefits, such as enhanced biodiversity, fisheries support and coastal protection. High resolution modelling of potential seagrass restoration sites in Wales highlights extensive potential opportunities.
- Wales is leading the way in UK (and European) seagrass restoration for the following reasons:
 - Has led research on seagrass restoration for over a decade, including the UKs first major seagrass restoration project.
 - Has an internationally leading group of experts at Swansea University on the ecology, conservation and restoration of seagrass.
 - Is the birthplace and home to the worlds only dedicated globally facing seagrass conservation charity Project Seagrass.
 - Is home to an exciting project to create one of the worlds first seagrass restoration nurseries in Pendine (Carmarthenshire).
 - Is leading the way in creating international networks with interdisciplinary experts in the field.

Actions required for seagrass and Blue Carbon in Wales

Legal responsibilities and instruments

- Land ownership around our coasts within the intertidal and subtidal area creates a barrier to undertake research and restoration of marine habitats. There is currently disconnect between the Crown Estate and other statutory regulators. In some locations, complicated networks of private land owners and occupiers can raise unpredictable site-specific barriers to gaining access to and permission to work on the foreshore and seabed.
- The Crown Estate as the principal landowner within our coastal seas is tasked under its duties in the Crown Estate Act 1961 with maintaining and improving the value of crown land. Blue carbon habitats have significant economic value (fisheries, carbon, biodiversity, water filtration, coastal defence). By allowing the degradation of the seabed and its biodiversity, and not supporting their restoration (including profiting from restoration) is contrary to its remit to enhance the value of this land.
- There needs to be an alternative route to securing statutory permissions for undertaking habitat restoration/enhancement that brings together land owner support with Welsh Government agencies in a simple straight forward manner that encourages the restoration of our seabed with Blue Carbon habitats. Staff within NRW are very helpful and supportive of marine habitat restoration but the system of governance for this is inherently unhelpful. The current marine licencing process was designed for managing potentially damaging operations and is a financial and logistical barrier to scaling up efforts.
- Currently the legal protections for seagrass are insufficient and largely meaningless. Stronger enforced measures are required to protect seagrass in all areas.

Scientific needs

- Consideration of marine and coastal habitats for carbon storage should look way beyond just the basics of organic carbon storage and sequestration and consider their whole Greenhouse Gas Balance. There is considerable potential that where habitats are in a degraded and stressed state that they become net emitters of greenhouse gases through methane and nitrous oxide emissions. Those habitats in lower salinity waters are likely more susceptible to such release.
- Creation of scientific networks to enhance understanding and develop improved action in support of Blue Carbon as a nature-based solution to climate change.
- The Welsh Government needs to make better use of its Universities to answer targeted research questions and pursue avenues of work congruent to improving the state of our coastal seas through a longer term vision.

Conservation opportunities

- Blue Carbon habitats are threatened by a range of factors, some of which are small scale and are 'low hanging fruit' in the context of marine conservation. Bottom trawling in SACs (e.g. Pembrokeshire Marine SAC) remains a threat to seagrass.
- Intertidal tractor use remains a threat to seagrass in some locations where it is acceptable to drive over seagrass.
- Boat anchoring remains a problem in seagrass in some areas. Increased investment in visitor moorings using Advanced Mooring Systems would reduce this activity.

- Providing fishermen with incentives (in the same manner as how farmers are paid to improve biodiversity) to support Blue Carbon conservation and restoration would create ready teams of marine conservation allies and wardens.
- Improved communication about where seagrass is and its importance will help reduce impacts.
- Some locations containing extensive seagrass slip between the gaps of conservation management. The Inland Sea (Holyhead) is such an example where it is largely unmanaged yet highly threatened by poor water quality.
- Wales could create a strategy to bring in external Blue carbon funding/investment as a means to revitalise its coastal environment and create so called 'Green Jobs'. This requires cross government initiatives aimed at solving bottlenecks.
- Restoration and conservation of our coastal habitats requires bigger joined up thinking across multiple stakeholders to create catchment based 'ridge to reef' type projects that improve coastal habitat connectivity.

Complex problems that need fixing and require urgent action

- Many seagrass meadows in Wales are in a poor state due to water quality. The biggest threat to coastal waters is eutrophication from excess nutrients flowing into places such as Milford haven waterway. **This is slowly killing existing seagrass.**
- The growth of poorly managed intensive farming in Wales is exacerbating problems of eutrophication and its impact on the coastal environment.
- Restoration efforts will fail without investment and action to improve coastal water quality. Nutrients and pollutants from agricultural runoff and inefficient sewage systems will limit the potential for marine vegetated habitats to recover regardless of restoration efforts.