



Marine Natural Capital Development on the Cumbrian Solway:

Current status, gaps and opportunities

Summary report



Photo: saltmarsh at Bowness on Solway supplied by Solway Firth Partnership

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Executive Summary

The Solway Firth is a large and dynamic estuary that joins Dumfries and Galloway, in Scotland, to Cumbria, in England. Its vast and wild landscape is home to a mosaic of habitats, history and heritage. The coastal landscape has been characterised by a long history of agriculture, with large areas of traditionally-grazed saltmarsh. The saltmarshes, sand dunes, sand and mudflats support high levels of biodiversity including great numbers of internationally important bird species and commercially important fish and shellfish populations. This report describes a baseline assessment of the natural capital assets of the Cumbrian Solway Firth and reviews the potential opportunities for enhancing or restoring the ecosystem services provided by these assets to ensure the long-term provision of valuable benefits. Throughout the report, the Solway being referred to is the Cumbrian Solway, unless the Scottish side is specifically indicated.

On the English side of the Solway Firth, key natural capital assets include, saltmarshes, sand dunes and biogenic reefs. There are also vast areas of sublittoral sand and mud habitats. These assets provide valuable benefits from climate change mitigation through the sequestration and storage of carbon, to alleviating flood and erosion risk by stabilising sediments and attenuating wave and tidal energy. They also form habitats, increasing biodiversity and maintaining nursery populations of important fish and shellfish species. They play a role in regulating water quality and provide opportunities for wildlife watching, walking and other recreational activities that improve human wellbeing.

A large part of this project involved consultation with local stakeholders and other relevant projects and organisations around the UK. This was done through one-to-one meetings and an on-line stakeholder workshop. During the workshop it was recommended that the focus of this report, and future restoration efforts, should be on saltmarshes, sand dunes and water quality. Climate change mitigation, biodiversity enhancement and improved water quality were identified as the key beneficial ecosystem services provided by the Solway's natural capital assets and therefore should also be a focus for any natural capital projects.

The natural capital approach takes into consideration the value of the natural environment for society and the economy. To understand the value of natural capital assets, it is important to have knowledge of the spatial extent, condition and location of the assets as well as the different pressures that act on them. This information will help to inform priorities for restoration of key ecosystems, habitats or species populations.

The state of saltmarshes in the Solway was assessed as an example, using Natural England's natural capital logic chain. The location, extent and quality were reviewed using the best available data. The drivers of change and pressures were also outlined. The potential to improve the quality of the Solway's saltmarshes was then considered. The key findings from the logic chain are:

- The Solway's marshes are extensive and nationally important. They are well protected within multiple designated sites, meaning that there is relatively good information available on their condition.
- Saltmarshes contribute to the following beneficial ecosystem services: they play a key role in mitigating the impacts of climate change through carbon sequestration and storage; they stabilise sediment reducing the risk of coastal erosion; they reduce the risks from flooding by dissipating wave and tidal energy; they maintain nursery populations and habitats for important fish and shellfish species including European

smelt; they provide cultural services, including tourism and recreation and health and wellbeing; and they help to regulate coastal water quality.

- Overall, the saltmarsh is not in a state of erosion, it has been expanding in recent years but the extent should continue to be monitored.
- The Solway's saltmarshes are heavily grazed, to levels suitable for the wildfowl species that are important to the area. However, there is a general view from stakeholders that many of the marshes are overgrazed and reducing grazing levels may enhance the saltmarsh's diversity.
- The impacts of climate change, particularly sea level rise, is a key threat to the Solway's saltmarshes. Agricultural management including grazing regimes and nutrient run off were also identified as key pressures.
- From conversations with stakeholders, there are limited opportunities for inland habitat creation, or landward expansion, because of the natural topography of the coast and the relatively low levels of land reclamation.
- Further conversations between stakeholders should be held to discuss opportunities for saltmarsh expansion or enhancement in sites identified by the Cumbria Coastal Strategy.
- It will be most important and feasible to enhance the marshes that already exist through re-wetting and reducing grazing levels.

Through the research, consultation and stakeholder workshop, the following conclusions, data limitations and potential opportunities for further work have been identified.

Data gaps and deficiencies

In the Solway Firth, data on marine and coastal species and habitats is generally lacking compared to other regions of the UK. The following data gaps and deficiencies were identified:

- There is limited monitoring, or current data, on extent and condition of key habitats, such as blue mussels and honeycomb worm reefs.
- There is a lack of historical data and evidence of native oyster reefs or seagrass meadows.
- There has been a lack of consistent data collection and surveying effort for seagrass across the North West coast.
- There is a lack of evidence on the feasibility of restoring priority marine and coastal habitats, including blue mussel beds and honeycomb worm reefs.
- There has been little evidence and data collected to show that habitat enhancement work on sand dunes and saltmarsh in the Solway has increased the provision of beneficial ecosystem services. For example, changes in invertebrate, fish or bird biodiversity have not been recorded following previous enhancement work on the Solway's saltmarshes.

Recommendations

- 1. Complete a full marine and coastal natural capital asset inventory for the Solway.** Building on the work outlined in the current report, there should be a more detailed review of the marine and coastal natural capital in the area that covers all species and habitats of importance, mapping of subtidal habitats and completing the list of the priority species that was started as part of the draft Local Nature Recovery Strategy (LNRS).
- 2. Undertake further monitoring and data collection on the marine and coastal natural capital assets.** The Solway Firth remains largely understudied compared to other marine regions. Building up more data will help to inform the completion of a baseline assessment on the location, extent and quality of the natural capital assets.
- 3. Produce logic chains for the Solway's key natural capital assets;** including sand dunes, biogenic reefs and other assets identified by the asset inventory. This work should include an assessment of the state of the assets.
- 4. Increase the understanding of the ecosystem services provided by the Solway's natural capital assets.** Much of the information provided in this report is based on UK or Europe-wide studies and may not be true for the Solway. It may be possible to map and model the ecosystem services in the Solway (this has been done for the Blackwater Estuary, see Shapland et al., 2021), which would then inform priorities opportunities for enhancing ecosystem service provision.
- 5. Improve understanding of the beneficiaries to the Solway's natural capital assets.** This initially can be done at a local/regional/national/international scale but with more data, more detailed work can be carried out to map which groups of people are seeing the benefits of the marine and coastal environment.
- 6. Map the socio-economic uses of the Solway.** This would help to provide a picture of where natural capital restoration could take place while balancing the needs and priorities of different stakeholders. This would also assist in the understanding who the beneficiaries are.
- 7. Research how the condition of the Solway's natural capital assets impacts their value.** For example, measure how differences in saltmarsh grazing regimes, (including sheep vs. cattle only grazing) impacts upon carbon storage, biodiversity or use of the saltmarsh as a nursery ground for fish.
- 8. Collect empirical data on the carbon sequestration and storage rates of the Solway's saltmarshes** to better understand how this habitat is contributing to climate change mitigation and how it can be improved.
- 9. Improve understanding of how European smelt and other juvenile fish use the Solway's saltmarsh.** The sampling strategy produced by Colclough et al. (2005) could be used and should look to identify any potential differences in habitat use in saltmarshes with varying grazing regimes.

10. **Continue to monitor accretion and erosion of the Solway's saltmarshes**, as well as changes in extent and the dynamics of associated sediment supply.
11. **Research potential methods for the restoration or enhancement of priority marine and coastal habitats**, including blue mussel beds and honeycomb worm reefs.
12. **Investigate potential habitat restoration sites.** Carry out further research and on-the-ground surveys of the sites recommended for habitat expansion or creation to see if they are suitable. Investigate sites that were shortlisted within the Dynamic Dunescapes and the Life on the Edge projects, as well as those identified in the projects discussed in this report.
13. **Research how local communities value marine and coastal natural capital assets.** The Scottish Wildlife Trust's Oceans of Value project and the Community Voices Method could be used to identify any hidden values.

In order for any future natural capital project to be successful, it is recommended the following steps are taken:

1. **Engage early** with communities, sea and coastal users, landowners, organisations and other stakeholders, to ensure success.
2. **Communicate what the natural capital approach is** with local communities, organisations and marine and coastal stakeholders, in order to overcome barriers such as, scepticism that the approach is all about money.
3. **Bring all saltmarsh landowners together** to share expertise and on-the-ground knowledge of the management of the marshes, discuss barriers to restoration and discuss the potential to change grazing levels.
4. **Involve local communities in any restoration work.** Through public engagement it will be important to increase awareness of the health and wellbeing benefits of saltmarshes and other marine and coastal ecosystems. This may help to realise the full potential of benefits derived from cultural services.
5. **Ensure monitoring and data collection** is conducted before, during and after any restoration work to help to inform whether it has been successful in increasing the value of the natural capital assets.
6. **Refer to best practice taking place in recent marine and coastal natural capital projects (or those with marine and coastal components) around the UK.**

Examples include the:

- a. [Blackwater Estuary Natural Capital Assessment](#)
- b. [Valuing the Solent Marine Sites, Habitats and Species](#)
- c. [Natural Capital Assessment of the Orkney Marine Region Area](#)
- d. [Natural Capital Evidence Compendium for Norfolk and Suffolk](#)
- e. [ReMEDIES: Natural Capital Seagrass and Mearl](#)
- f. [North Devon Marine Natural Capital Plan](#)