Blue Carbon

Insights into blue carbon finance

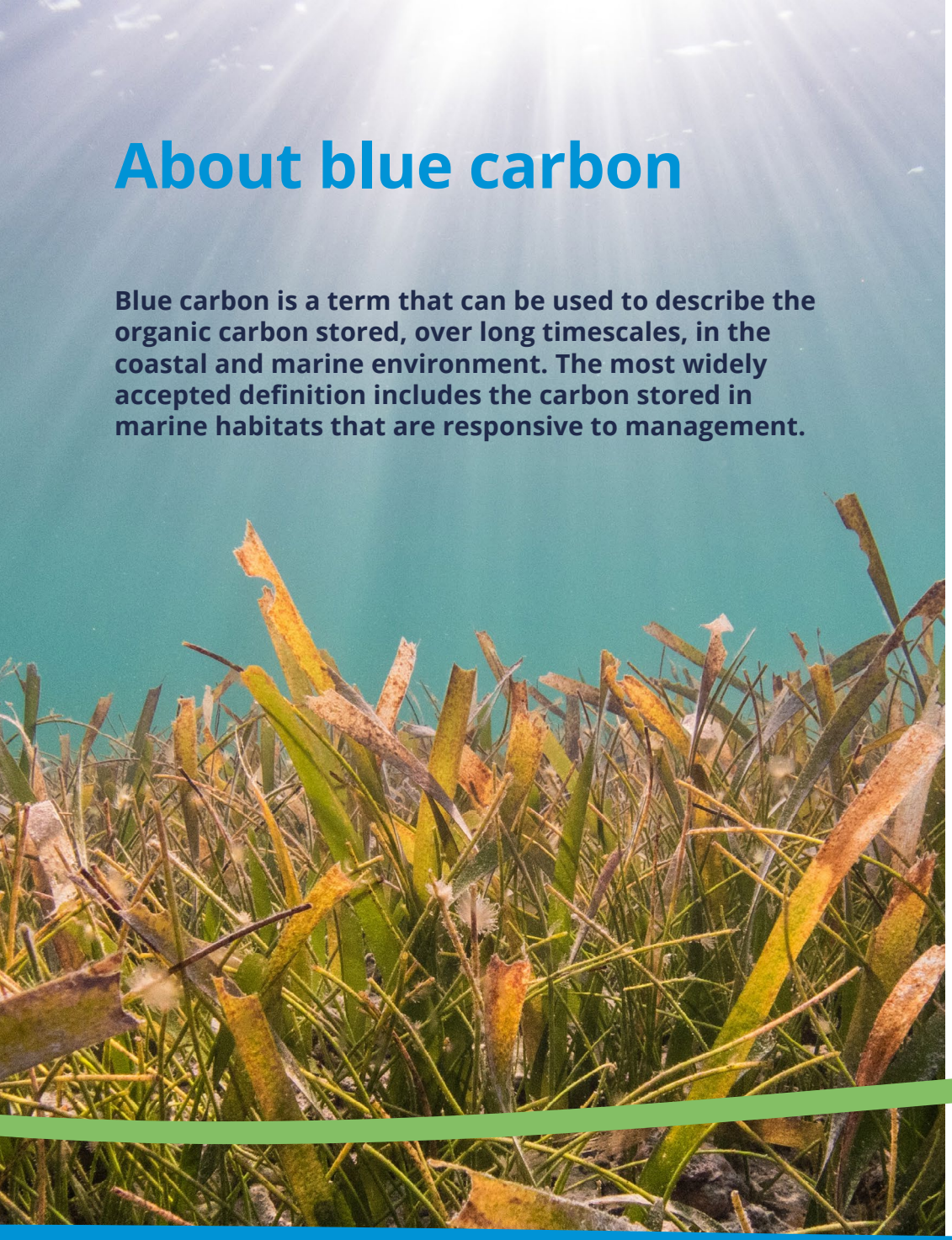
2023

Blue Belt Programme

UK Government

About blue carbon

Blue carbon is a term that can be used to describe the organic carbon stored, over long timescales, in the coastal and marine environment. The most widely accepted definition includes the carbon stored in marine habitats that are responsive to management.



Particular attention has been focused on vegetated coastal ecosystems such as mangroves, saltmarshes, and seagrasses due to their high productivity and ability to store large amounts of carbon over long periods compared with terrestrial forests, which makes them among the Earth's most efficient carbon sinks and thus have an important role in mitigating climate change.

These blue carbon habitats also contribute to climate change adaptation by protecting coasts from erosion and extreme weather events and promote resilience by providing nursery grounds for commercially important fisheries, improving water quality by filtering nutrients and pollutants, and supporting unique biodiversity.

UK Overseas Territories host a rich array of biodiversity and unique habitats, which present exciting opportunities for the exploration of blue carbon initiatives.

Blue carbon habitats in UK Overseas Territories are diverse, ranging from the mangrove forests of Anguilla to the seagrass beds around the Turks and Caicos Islands, and the kelp forests of Tristan da Cunha.

Why is blue carbon important?

Historically there have been high rates of degradation and loss of these habitats with studies estimating that global carbon emissions resulting from these losses equate to 0.15 – 1 billion tonnes of carbon being returned to the atmosphere. These emissions further exacerbate climate change and reduce the resilience of local areas to the impacts of climate change.

Nature-based solutions are actions that protect, sustainably manage, and restore ecosystems to address societal challenges while simultaneously benefiting people and nature[1].

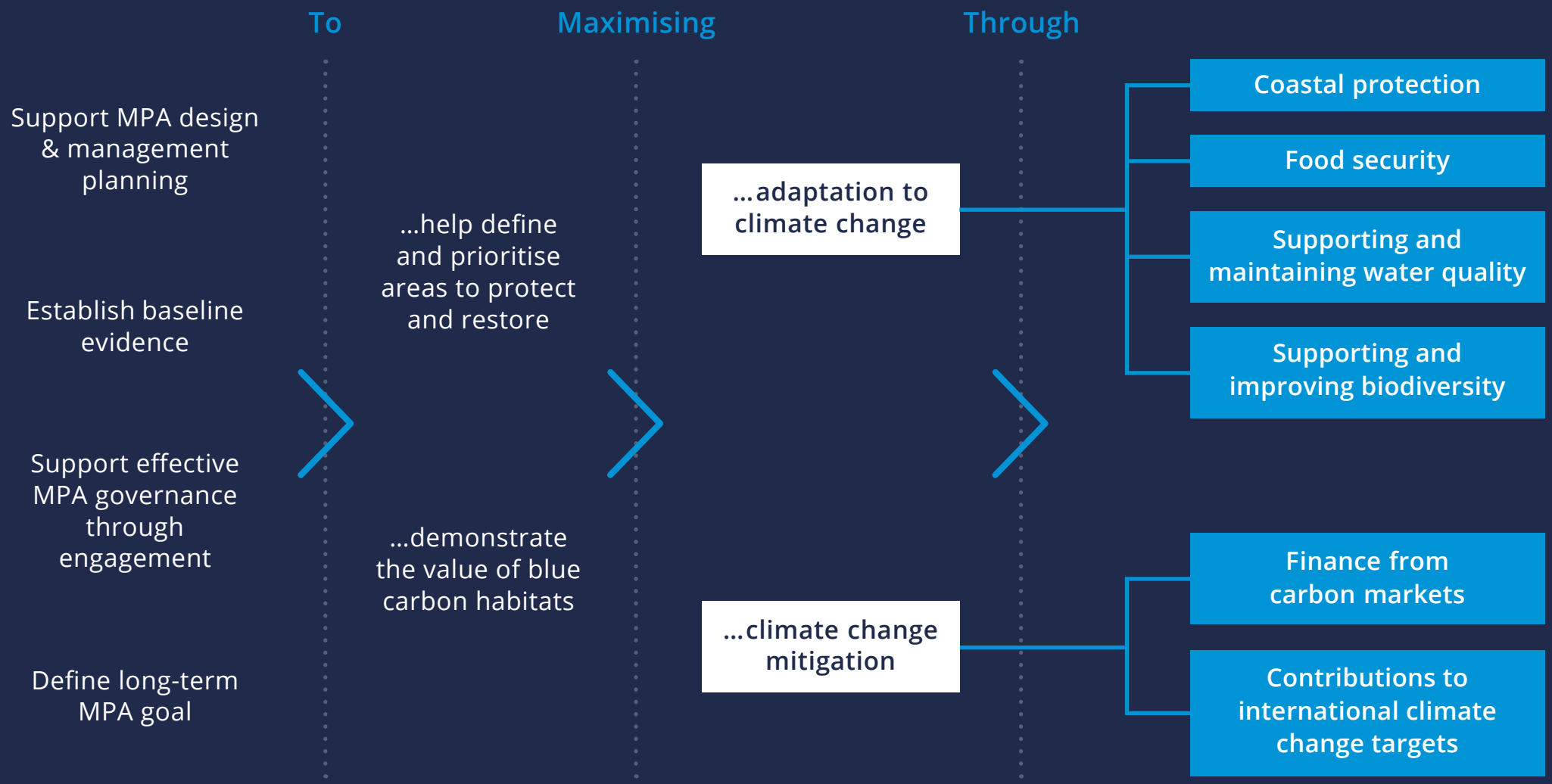
Actions implemented in blue carbon ecosystems are particularly suitable for nature-based solutions and they can address climate change in three ways:

1. Decrease greenhouse gas emissions related to deforestation and land-use changes
2. Capture and store carbon dioxide from the atmosphere
3. Enhance resilience of ecosystems, and as such support societies to adapt to climate hazards such as flooding, sea-level rise, and more frequent and intense droughts, floods and heatwaves.

There are numerous reasons to consider blue carbon in marine protected area (MPA) planning and decision making, all of which can facilitate long-term approaches to support healthy coastal ecosystems and thus improve the resilience of the coastal communities dependent on them. These reasons are summarised on the following page.

1. https://www.iucn.org/our-work/nature-based-solutions

Why consider blue carbon in MPA planning and decision making?



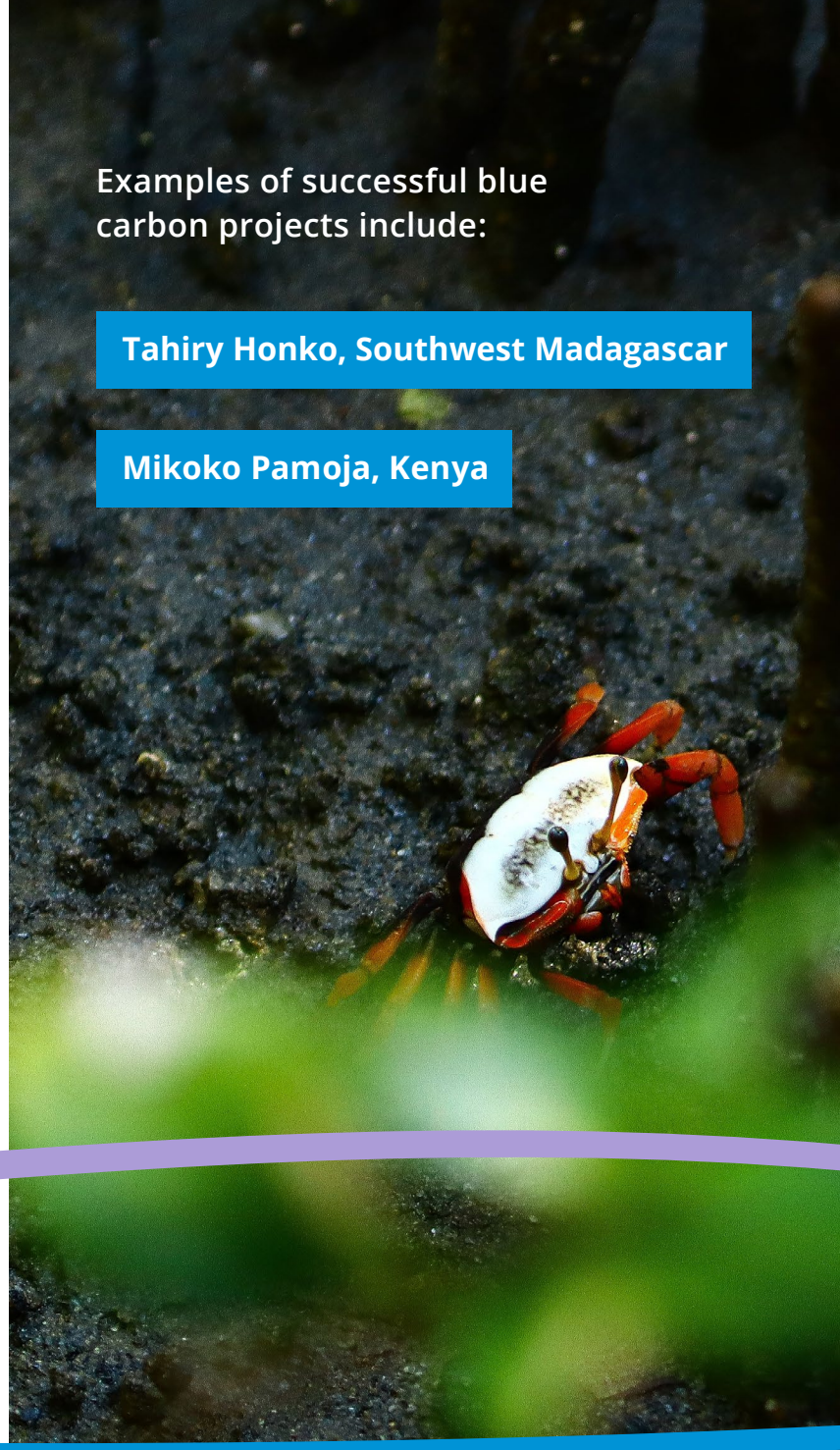
Blue Carbon to leverage finance

High-quality nature-based carbon credits[2] are a powerful tool for driving climate mitigation and resilience through the conservation and restoration of nature.

Where sustainable management activities are implemented in blue carbon ecosystems, the value of the carbon savings provided by the activities can be validated and sold as credits through the voluntary carbon market. Those credits can then be sold to buyers who are looking to reduce their carbon footprint.

Access to voluntary carbon market finance represents an opportunity to provide regular, predictable funding to projects that can support the long-term management and protection of ecosystems with multiple additional benefits to local communities.

In addition to climate regulation, healthy blue carbon ecosystems provide services such as food security, coastal protection and water quality. Effective blue carbon initiatives will deliver on climate mitigation outcomes through the protection and/or restoration of blue carbon habitats and be designed to enhance the resilience of local communities, which makes blue carbon particularly attractive to investors.



Examples of successful blue carbon projects include:

Tahiry Honko, Southwest Madagascar

Mikoko Pamoja, Kenya

2. Carbon credits (sometimes referred to as carbon offsets) are a tradeable certificate representing a measurable and verifiable emission reduction. One credit is usually equivalent to the reduction or removal of one tonne of carbon dioxide equivalent (CO2e). The sale of carbon credits (e.g. by carbon offsetting schemes) can generate funds for projects.

Steps to carbon credit issuance:

Pre-feasibility Study

- Early-stage desk review
- High-level country readiness assessments
- Simple financial models using default values

Project Viability

- Identify datapoints required to establish project viability
- Field sampling to establish a carbon baseline
- Participatory mapping with stakeholders
- Revision of financial models

Planning

- Production of a PIN (Project Idea Note) for submission to a carbon accreditation program
- Understanding socio-economic conditions and project impacts
- Planning for alternative livelihoods and sustainable incomes
- Technical site mapping, zonation, elevation, hydrology, carbon baselines, and appropriate interventions

Project Development & Implementation

- Production of a PDD (Project Design Document) for submission to a carbon accreditation program
- Setting Key Performance Indicators (KPIs) to track project progress & success
- Planning for Monitoring, Reporting, Verification (MRV)
- **Validation and accreditation**

Ongoing project operation

- **Third-party verification and credit issuance**
- Maintaining performance and integrity throughout the project lifespan
- Assessing the effectiveness of alternative livelihoods and tangible positive benefits for stakeholders
- Ensuring continual community engagement and support of the project
- Annual reporting and transparency

Considerations for blue carbon project development:

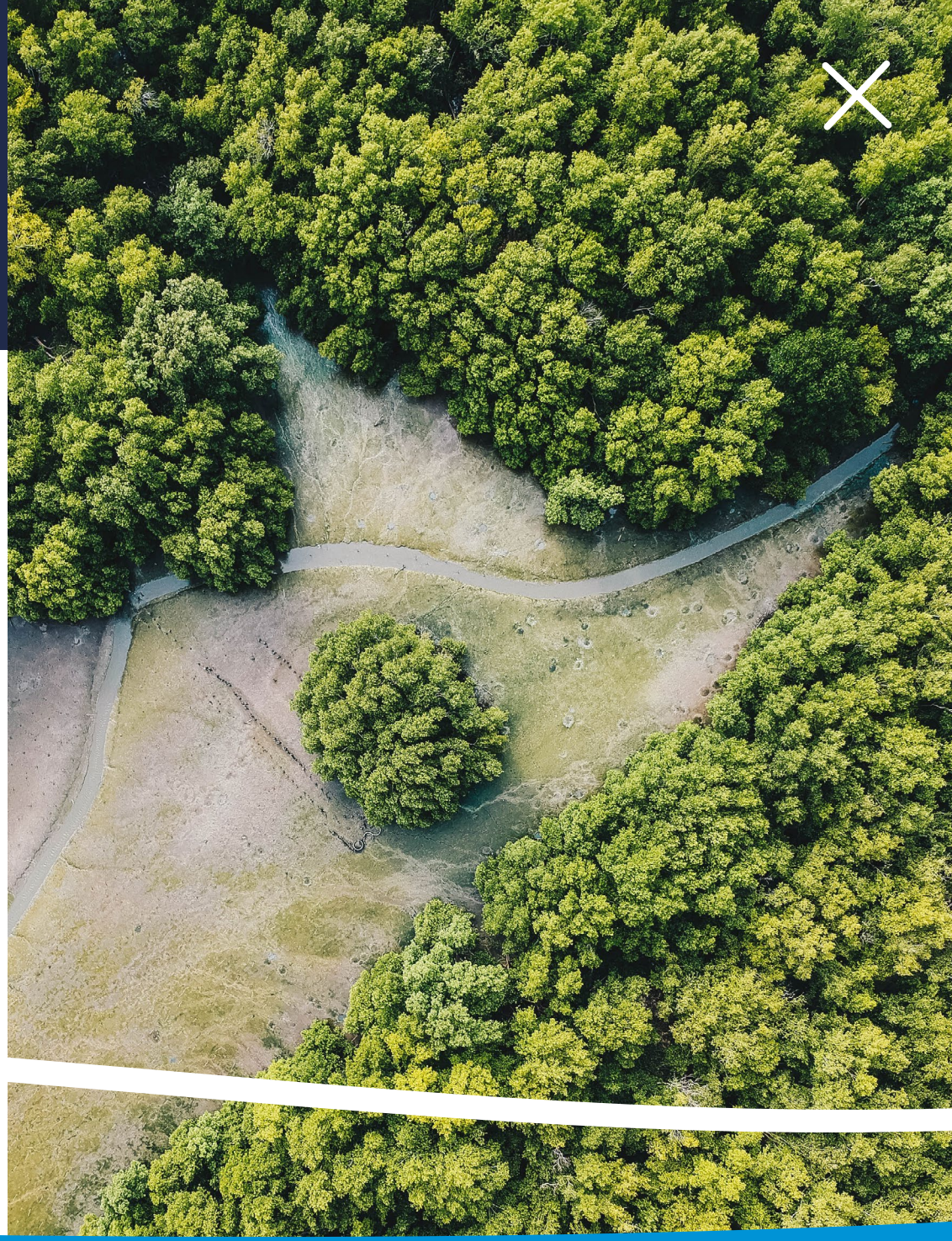
Though carbon financing presents a growing opportunity to support the conservation, restoration and sustainable management of blue carbon ecosystems there are a number of considerations that should be taken into account.

- Habitat Scope
- Policy & Governance
- Additionality
- Risks
- Data Availability
- Timescales
- Funding

Habitat Scope

Currently, only projects focussing on the vegetated coastal habitats; mangroves, seagrass and saltmarshes can be included in carbon projects due to their inclusion in carbon market standards and methodologies, which have been developed using the best available science. These standards include those such as Verra's Verified Carbon Standard and Plan Vivo.

Although there is increasing interest in the carbon stored in subtidal marine sediments and kelp there are currently no carbon market standards that can be applied to activities carried out in these systems due to the lack of evidence required to prove that they result in emissions reductions. For these habitats, research is evolving with aims to fill knowledge gaps, which may allow for the development of appropriate standards to unlock carbon finance opportunities in the future[3].



3. Lovelock, C.E., and C.M. Duarte. 2019. "Dimensions of Blue Carbon and Emerging Perspectives." Biology Letters 15 (3): 20180781. doi.org/10.1098/rsbl.2018.0781.

Policy & Governance

Blue carbon projects are complex and require collaboration between governments, developers, investors, and local communities. The level of stakeholder engagement within a project is a major factor in the success of a project.

Blue carbon habitats occur at the junction of land and sea and may fall under overlapping jurisdictions and legislations. Furthermore, carbon rights – rights to own or sell carbon storage services – do not always exist and can be unclear. It is essential to consult with the correct government bodies prior to project development.

Policies should ensure that the communities bearing the burden of reducing emissions or enhancing carbon stocks are prioritised and that benefits are shared in a just and equitable way.

Further work is needed to ensure that there is alignment between small-scale projects and national and international frameworks such as Nationally Determined Contributions.

Additionality

Carbon finance projects must be able to prove additionality. ‘Additionality’ in this context is the extent to which emissions reductions occur as a result of a project intervention that would not have happened in the absence of the intervention.

Additionality in blue carbon projects can be uniquely challenging due to the widespread existence of MPAs, existing coastal wetland management plans and national conservation priorities. For example, where blue carbon habitats are already effectively managed, blue carbon finance projects will struggle to prove additionality and thus progress through to verification.

Risks

In addition to the risks associated with uncertain policies and governance, the drivers of blue carbon habitat loss can originate upstream of the habitats, e.g. nutrient run-off from land, which can make the risks to blue carbon projects more difficult to mitigate and often more difficult include in projections.

In addition, blue carbon projects will likely need to account for long-term climate-related changes such as sea level rise, increased storm intensity and warming seas. Projects are required to consider how to adapt to these changes over the lifespan of the project. The use of scientific models can be used to assess the durability of projects and effectively communicate the level of uncertainty and expected magnitude of risks.

It will be necessary to implement mitigation measures to address risks to the project. Some standards will require developers to set aside a buffer pool of credits (that cannot be purchased) to cover any reversals of carbon benefits over the project lifespan.

Data Availability

High quality blue carbon projects must be grounded in robust evidence. Data are required to establish baselines and prove additionality. Initially this involves the systematic mapping of blue carbon habitats, analysis of the drivers and patterns of habitat loss and degradation as well as carbon stocks assessments to determine the level of emissions reductions. Collection and analysis of these data, and the ongoing monitoring required, can be a costly and time-consuming process.

Timescales

The time between the initiation of a carbon project through to the first credits being issued is very often multiple years. This process includes establishing legal frameworks, the technical design of a project, stakeholder consultations and the development of alternative livelihoods. Furthermore, the costs associated with the verification of a project are heavily frontloaded to the first years of a project timeline.

Funding

Although a number of blue carbon projects are now operational, proving the feasibility of blue carbon, many of these projects have been philanthropically funded through to validation.

Future project development will have to rely on increasing the scale of projects to overcome high set-up costs and the **project development commitment** (see page 6), to ensure a return on investment. To increase the scale and carbon value of the project, project developers may need to consider increasing the extent of newly protected or restored habitats or explore opportunities to collaborate with other projects, sites, or even between nations and governments.

A recent but growing trend in carbon projects is to monitor and account for not just carbon sequestration but co-benefits such as biodiversity and community benefits. A project that can demonstrate these additional benefits can potentially realise higher prices for its carbon offsets, which reflect both the true social value of these ecosystems and the additional costs required to deliver these co-benefits.

To tackle climate change there must be a reduction of emissions globally. This can be supported through the implementation of nature-based solutions such as blue carbon, which along with reducing emissions, can contribute to climate adaptation, food and water security and human health.

While carbon finance represents an increasingly attractive way to support the management of blue carbon habitats and wider marine protection goals it should be considered carefully as there are several factors to take into account as presented here. In some cases, access to the voluntary carbon markets alone may not be sufficient to fund the protection of blue carbon, thus it is important to explore a range of financing options that complement carbon activities.

Where practitioners have reviewed the reasons to consider blue carbon in planning and decision making and are interested in exploring blue carbon options further they are encouraged to assess the current availability of spatial data documenting the extent of blue carbon ecosystems within their area of interest. This will provide a useful first step towards establishing a required baseline prior to an assessment of feasibility.

If you are interested in assistance with exploring blue carbon options in more depth, please contact your Blue Belt Programme representatives from MMO and Cefas, or email bluebelt@cefas.gov.uk

For more information on the details presented here please see the following consulted resources and references therein:

High-Quality Blue Carbon Principles and Guidance

Fair Carbon

Identifying mangrove blue carbon barriers - Blue Ventures

Web: www.gov.uk/government/publications/the-blue-belt-programme
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