Guide to Blue Finance Opportunities:

Biodiversity Net Gain, Marine Net Gain, Blue Carbon, Blue Nutrients and Grant Funding

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Contents:

Each of the funding streams looked at in this document is supplied with the following:

- Key words
- Who's involved?
- What can/can't be monetised?
- What monitoring and management is involved?
- What is the timeline?
- How are credits traded?
- What incurs costs?
- How long is the scheme of funding for?
- What barriers are there?
- What projects are currently underway?

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BLUE FINANCE MECHANISMS SUMMARY TABLE

Topics	Definition	Advantages	Barriers	Live Projects	Implementation for TtT
BIODIVERSITY NET GAIN	Statutory requirement of developers to achieve at least 10% BNG improvement compared to before development. This applies to coastal/marine environments down to the mean low watermark.	Emerging market is now statutory. NE and DEFRA are responsible. Can be stacked with Nutrient mitigation credits. Established monitoring and management processes (HMMP) and BNG calculators.	Market is still developing. High up-front costs. Baseline surveys need updating for many existing sites. LPAs lack enforcement powers. LPAs lack staff/expertise to monitor and manage projects.	PV Nature is a developing biodiversity standard being piloted within the Solent Seascape Project	Framework is established within UK meaning it is applicable to local environments: Salt marsh, Coastal floodplain grazing marsh, Seagrass, Native oysters, Coastal shingle / beach nesting bird habitat
MARINE NET GAIN	MNG is an approach to development where you leave nature in a better state than beforehand. This applies below the low water mark.	MNG is being established from principles, allowing for new principles and new aims to be established. MNG will incorporate both habitats and species; wider environmental benefits and pressure reduction..	No established framework. No existing methods for monitoring or management. No established ways of trading or costs of MNG. No established ways of quantifying habitats and species losses and gains.	OWEAP 's 3 evidence projects: MNG assessment framework to measure losses and gains Marine irreplaceable habitats mapping (MBA) MaRePo+ is Investigating habitats and species with potential for restoration, recovery and enhancement.	Potential MNG pilot project. Protection, recovery and enhancement work in habitats or for species. Evaluate potential of a contributions-based approach. Potential habitats to investigate: Subtidal seagrass, Mussels, Oysters, Kelp
BLUE CARBON	Environmental credits derived from the biologically driven carbon fluxes and storage in marine systems that are amenable to management (IPCC 2019).	UN supervisory body for a global carbon market is being established. High-demand. General understanding of carbon credits.	No established blue carbon framework. The integrity of carbon credits are being questioned. Evidence gaps: eligibility, additionality, permanence and leakage	Blue Carbon report: Blue Carbon habitats, their associated carbon capture rates and carbon stocks and the threats. Saltmarsh code is being established.	Potential blue carbon pilot project. Potential habitats to investigate: Subtidal seagrass, Saltmarsh, Coastal floodplain grazing marsh
BLUE NUTRIENTS	Environmental credits capturing and storing excess nutrients, e.g. nitrogen or phosphorous.	NE have established terrestrial/freshwater framework, this can act as a marine template. Scheme of funding lasts for 80-125 years. Can be stacked with biodiversity credits.	No established marine standardised framework. Research needed to quantify nutrient sequestration in different habitats and standardise credits. Monitoring is challenging in dynamic habitats	No live projects with the sole purpose of creating nutrient credits in a marine environment. NE Nutrient Mitigation in the Poole Harbour and Tees catchment exists but focuses on freshwater environments.	Established framework is mostly freshwater focused, international projects could be used for local projects: Seagrass, Saltmarsh, Oysters, Coastal floodplain grazing marsh

Introduction

Guide Contents:

This is a **simple guide providing an overview to different Blue Finance funding opportunities**. This includes a **glossary of key words** used within Blue Finance and Sustainable Financing, as well as **short summaries of 'need-to-know' information** covering the main environmental credits available. **Current live projects**, pilots and frameworks for the relevant opportunities are also highlighted, as well as possible areas of work for the Transforming the Thames (TtTs) project. **TtTs** is a collaborative seascape-scale restoration, reconnection and recovery project within the Thames Estuary. It aims to restore and reconnect damaged habitats for the next 10 years and beyond. This guide analyses some of the options available to help fund this project.

The Blue Economy and Blue Finance:

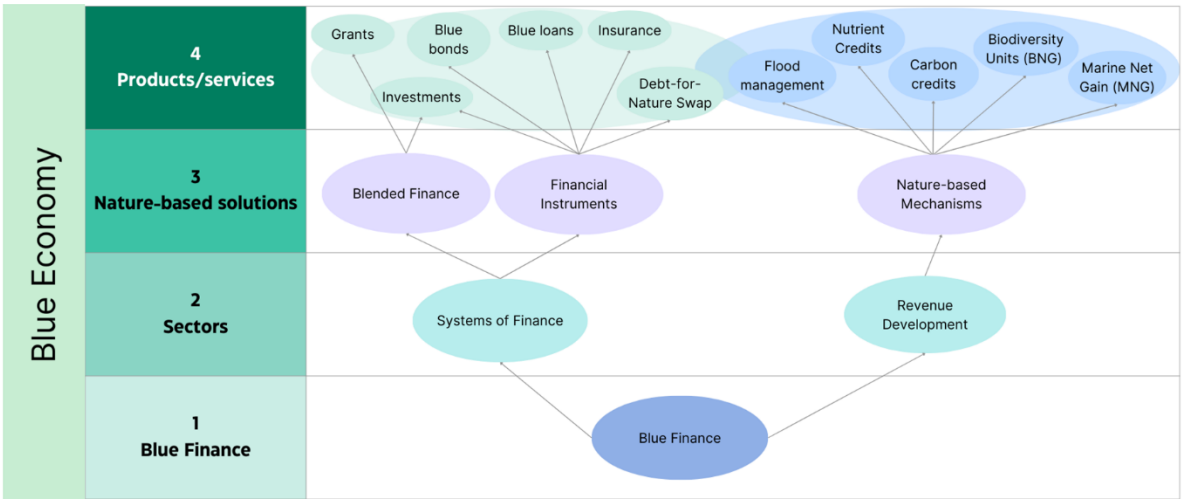

Figure 1. Blue economy is the sustainable use of ocean resources for economic growth. Incorporating prosperous livelihoods with healthy ecosystems. Blue finance is a tool to implement blue economy via establishing systems of finance and methods of revenue development.

Blue economy encompasses all **economic activities relating to the ocean.** Organizations or individuals working within sectors relating to the ocean, are all part of the blue economy. What is the blue economy? - Grantham Research Institute on climate change and the environment Activities that contribute to the blue economy include renewable energy, fishing and aquaculture, shipping and navigation, as well as coastal and ocean tourism.

Blue finance is the tool used to drive the blue economy. Investors, financial institutions and conservationists are turning towards blue finance to drive climate friendly

investments. This is a vital tool to fund the investment into **blue solutions** – funding **restoration efforts** and means of building **resilience**. **Private and public economies** are adapting the **financial systems** to gear towards **green/blue investments** that can help **alleviate flood risks, droughts, water pollution and water acidification**.

Nature-based mechanisms, are **actions that protect, manage or restore natural ecosystem resources or services**. This is done through supporting different ecosystem processes, such as biodiversity enhancement, carbon capture or nutrient absorption. **nature markets**, which are currently being established. In these markets, there are **investments** through the **purchase of environmental credits**. **Voluntary nature markets** are markets where **buyers purchase units of ecosystem services voluntarily**, mainly corporate responsibility to meet net zero targets. **Compliance nature markets** are markets where **buyers purchase credits to meet regulatory requirements**, such as biodiversity net gain requirements. Within these markets both financial instruments and nature-based mechanisms are used to drive investments.

Financial instruments and nature-based mechanisms that interconnect and apply to the blue economy. **Financial instruments**, such as blue bonds and blue insurances, are **contracts between two parties that can be traded, modified or settled**. They raise funds for activities or work that meet a certain criterion, and in the case of blue finance, this is directly related to ocean-activities.

Utilising Blue Finance is important because it **benefits the environment and society**, now and in the future. Investing in nature recovery will help **improve the health of the marine environment**. As well as helping tackle the biodiversity and climate crises, nature restoration also **works towards the United Nations Sustainable Development Goal 14 Target** - Life Below Water: to conserve and sustainably use the ocean. Restoring blue environments (coastal and marine habitats) will provide green and blue spaces which can **support and benefit community health and wellbeing**. Furthermore, **protecting the raw resources and materials which humans rely on can support livelihoods** and provide resilience extreme climate effects. Within a changing climate, this benefits businesses by acting as **risk mitigation**. Consequently, this can **attract and engage a wide-range of investors** from across sectors to invest in nature recovery.

In **2018**, the United Nations Environment Programme launched the Sustainable Blue Economy Financing Principles, the **world's first global guiding framework for the Blue Economy**. As a result, this is very much still **a developing area of sustainable finance**, with markets just emerging. Consequently, as well as multiple existing **knowledge and research gaps**, UK **legislation and frameworks are still in development**.

The Environmental targets (Marine Protected Areas) regulations 2023 put in place the goal that: "70% of the designated features in the marine protected area network to be in favourable condition by 2042, with the remainder in recovering condition". As frameworks develop and markets continue to emerge, **his guide aims to explain and evaluate the different Blue Finance opportunities** available to sustainably generate income, whilst protecting the marine environment.

Report Scope:

This guide focuses on Blue Finance opportunities (nature-based opportunities like environmental credits), rather than financial instruments, such as blue bonds and loans, debt-for-nature swaps or blended finance. Similarly, this report does not discuss facilitative organisations and programmes that provide detailed support in developing financial models, transaction structures and contracting mechanisms, such as the **UK Nature Accelerator**. The role of grant funding within sustainable finance is also recognised, however this is not evaluated in this report. These instruments and programmes are useful in delivering Blue Finance projects. Though not covered in detail within this guide, **please see the glossary section below for more information**. This guide focuses on sources of funding rather than financial advice. Although this guide will look at Blue Finance opportunities applicable nationwide, it will also evaluate their applicability within the south-east of England for the TtTs Project.

This guide aims to be a comprehensive and accessible explanation and evaluation of different Blue Finance opportunities. As such, this glossary will cover key words that are used within sustainable financing to help contextualise understanding of this guide.

Glossary:

Blue Economy: Blue economy is defined by the World Bank as the sustainable use of ocean resources to benefit economies, livelihoods and ocean ecosystem health.

Blue Finance: Blue finance is a tool within blue economy that refers to financial practices and policy efforts that promotes sustainable investment in the ocean.

Environmental Credits: Units representing a quantified amount of environmental benefit (e.g. to avoid, reduce or sequester carbon emissions) that can be bought or sold on the open market.

Nature market: Market centred around the quantification or trade of goods and services directly linked to nature, such as natural capital and ecosystem services.

Nature-based mechanism: A nature-based mechanism refers to approaches or methods of utilizing natural processes, systems or elements to address societal challenges. Nature-based mechanisms often align with nature-based solutions.

Revenue Development: The organization or creation of a revenue stream, which can then be sold in a nature market.

BNG vs. MNG: BNG includes all habitats extending down to the mean low water mark. MNG includes the ecosystems beyond this point.

Flood-risk mitigation: lowering the severity of flooding which in turn lowers the risk of damage to people, land and property due to flooding.

Offsetting emissions: A way of compensating for carbon/excess nutrient release into the environment by funding the equivalent capture of these components elsewhere.

High integrity: Something (e.g. a credit) is trustworthy and reliable, for example by being traceable, verified by third parties or subject to rigorous monitoring and management.

Systems of Finance: Practices and institutions which make up and facilitate the network of finance methods that various organizations use. These systems are used to distribute and allocate capital.

Blue Financial Instruments: Blue financial instruments are financial tools that support activities beneficial to the marine environment. Such activities may include the purchase of environmentally friendly goods and services, or the construction of blue infrastructure

or habitats. Examples of blue financial instruments include: blue bonds, loans, and funds; debt-for-nature swaps and blended finance.

Blended finance: Combines public or private investment with philanthropic grants to mobilize additional funding for projects delivering social, environmental and economic outcomes. This helps share risk within a project, unlock larger amounts of private investment where only limited grants are available, and invests in sectors that might not receive much private capital.

Blue grants: A non-repayable financial contribution given by governments, international organisations, foundations corporations etc. To fund projects or initiatives. In terms of blue finance, these projects would support the sustainable creation, management and conservation of marine environments.

Blue investments: The allocation of financial resources to a project, business or initiative, with the aim of generating economic, social or environmental benefits. This differs from a grant because investment expects a return of value in exchange for the financial resources.

Blue bonds: A type of debt instrument that helps finance projects which support the sustainable use and conservation of the marine environment. These might be issued by governments, development banks or corporations, after which the investment is paid back with added interest.

Blue loans: A financial instrument where a lender (e.g. bank, development agency, government or private institution) provides capital (financial asset or good that holds value) to a borrower (e.g. a local government, organisation or business) to fund the sustainable use and conservation of the marine environment.

Blue insurance: Financial mechanism which provides financial protection to a stakeholder within the blue economy by offering financial coverage, in return for paying premiums, for specific risks such as flood disasters.

Debt-for-nature swaps: An agreement between a country and lender to restructure or buy back debts in exchange for commitment to invest in nature recovery, e.g. into projects that conserve, restore and enhance the marine environment.

Impact-only investment: Impact-only investment is an investment strategy that not only seeks to generate financial returns but also creates a positive social or environmental outcome.

Equity: In equity investment, investors get an ownership share in the asset or project. In turn, the investor receives regular payments from any profits generated. Some equity investments can be impact investments, where a longer-term investment with a lower

return is agreed upon in exchange for the creation of a positive social or environmental outcome.

UK Nature Accelerator: The UK Nature Accelerator programme is an institutional-scale private market impact fund that provides technical and financial assistance for nature-based solution projects. This programme works on a matched-funding basis and works with near-investment and investment-ready projects. The Accelerator offers the following services: technical assistance, capacity building support, and resources. Follow this link if you would like to find out more: Accelerator - UK Nature Impact Fund. Other organisations that help facilitate landscape-scale restoration projects, and assist in the design, development and structuring of sustainable landscape projects include The Landscape Finance Lab, which is launching the N+ Facility programme, and Palladium.

Biodiversity Net Gain (BNG):

Key words:

Statutory / Mandatory BNG: is a statutory requirement of developers to achieve an improvement of at least 10% BNG, as measured by the statutory biodiversity metric, compared to before development. BNG applies to all land up until the low water mark.

Voluntary BNG: Similar in function to statutory BNG but it is not attached to development and is not a legal requirement. This is when an entity enters into a voluntary agreement to either produce biodiversity uplifts or buy voluntary BNG credits. Voluntary BNG will not be focused on in this section, but you can see some examples on page 11.

Biodiversity Metric: A tool for calculating biodiversity value.

Biodiversity Units: The product of the biodiversity metric: a standardised unit of measurement for biodiversity value. This unit can then be sold on private off-site markets.

Biodiversity Credits: If no on-site BNG can take place, and off-site units have not been bought elsewhere, statutory biodiversity credits can be bought from the government.

Conservation Covenant: A private voluntary agreement between a landowner and a responsible body (RB) to conserve the natural heritage of the land (including biodiversity), which can continue even if land changes hands.

Habitat Bank: The Local Government Association describes habitat banking 'as an approach where investors pay landowners to increase the biodiversity value of their land, and this uplift is then sold as units to those that need off-site biodiversity net gain. Often habitat is created in advance of units being sold meaning this is an ecologically beneficial approach. In practice, the term 'habitat bank' can either be used to describe:

1. The parcel or parcels of land where the value of biodiversity is uplifted to provide off-site biodiversity units.
2. The green finance approach where investors finance habitat restoration, enhancement and creation, and are rewarded with both monetary interest and environmental returns. See the Future Parks Accelerator resource for more information.

In some cases, the landowner may take on the task of uplifting habitats prior to investment as this can provide more units to sell in the long-term. However, this comes with financial risk. They may also choose to outline their potential through brokers or wait for buyers to invest before any work is carried out. Habitat Banks should be secured

through Section 106 agreements and have a valid habitat management and monitoring plan.

What is BNG?

Who's involved?

	Involved in BNG Framework and Policies	Involved in BNG Implementation
Government Bodies	The **Government** is involved in producing legislative and policy frameworks e.g. the Environment Act, which outlines BNG. **Defra** is responsible for the legislation and setting legal guidance.	**Natural England** is involved in running the gains site register and selling statutory biodiversity credits.
Local governing bodies	**LPAs** will incorporate BNG policies into local plans so that they align with the national requirements	**LPAs** approve and monitor development proposals and biodiversity plans. They can also provide offsite units to developers from their own land, as well as holding the responsibility of monitoring compliance to BNG commitments.
Environmental Organisations and Consultancies	NGOs, e.g. the **Wildlife Trusts**, will work with governing bodies to help develop policies and standards.	**NGOs** (non-governmental organisations) can also create and sell units, but they also help manage this process for others. Consultancies are instrumental in implementing BNG projects.
Landowners		**Land managers** can create and sell off-site biodiversity units on the market.
Industry		All **developers** of both major and small developments must carry out BNG, meaning developers are involved when buying off-site biodiversity units. There are some limited exemptions e.g. a development that does not impact a priority habitat and impacts less than 25 square metres (5m x 5m) of on-site habitat or 5 metres of on-site linear habitats such as hedgerows. **Investors** can get involved by funding biodiversity creation/restoration projects as a way of generating units which can offset their emissions.
Facilitative bodies		**Private land agents and brokers** can be involved in facilitating transactions between landowners and developers.

What can/can't be monetised?

- Projects that **create, restore and enhance habitat** biodiversity can generate biodiversity units which can be sold. In a blue finance context, this includes estuaries and coastal wetlands.
- Biodiversity projects can **take place on existing wildlife and nature reserves, SINCs** (sites of importance for nature conservation) and **undesignated areas**, they can also include **green/green-blue infrastructure** plans. Within these areas units can be monetised.
- Any biodiversity unit generation (biodiversity enhancement) on a **SSSI** (site of special scientific interest) would require **Natural England's approval**, it is possible that unit generation cannot take place, meaning no monetisation.
- On-site or off-site biodiversity gains on land can be secured through planning conditions, but they can **also be agreed under a conservation covenant**. Any units generated through this agreement can still be monetised.
- You **cannot stack BNG with carbon units** on the same land for the same activity. However, they **can be combined with nutrient mitigation activity.**
- In line with BNG guidelines, habitats, and the biodiversity units within, must be maintained for at least 30 years. Therefore, **temporary gains** without long-term management plans **cannot be monetised**.

What monitoring and management is involved?

- **An EcIA assessment (Ecological Impact Assessment)** identifies ecological impacts of a development.
- **BNG and assessments** and the **Statutory Biodiversity Metric** can be used to measure the starting biodiversity value of a habitat (baseline survey), which helps design post-development plans.
- **Management and monitoring** of a BNG site is required **for at least 30 years.**
- A **Habitat Monitoring and Management Plan** (HMMP) is required legal agreement that states:
    - How habitat will be maintained
    - Who is responsible for creation/enhancement of the habitat
    - Who is responsible for monitoring, maintenance and management of the habitat
    - When and how you'll report monitoring results
    - When and how you'll review management proposals
    - How you will amend management to achieve biodiversity net gain

- **LPAs have the responsibility of planning enforcement powers,** this means they will monitor activities from the application to the management stage, making sure there are no violations of the planning conditions.

What is the timeline?

- For the creation of biodiversity credits on a habitat bank site, **timelines will vary** dependent on the site. However, below is a simplified overview of key steps that will take place:
    - **Site selection:** baseline biodiversity surveys (seasonally dependent) on the site
    - **Site feasibility:** assess the site for BNG requirements and/or options for enhancement
    - **Site design:** includes pre- and post-development biodiversity value calculations, asking for project application advice and validation, making sure protected species licences are in place
    - **Securing the land:** land is legally secured with conservation covenant or planning obligation with an LPA
    - **Land registration:** land is registered on the DFRA, Biodiversity Gain Register
    - **Planning application:** the application is created and submitted to an LPA. This will be an 8 to16-week turnaround depending on the size, complexity and ecological impact of a development
    - **Agreeing on sale of biodiversity units** to a developer
    - **Record and register allocation of units** to developers
    - **BNG Plan approval:** the plan is approved, conditions are agreed upon and last checks that developers have the correct allocations
    - **Habitat creation and enhancement:** If habitat creation, enhancement or management work hasn't started by the time the off-site units have been bought, it **should start within 12 months of allocation**.
    - Enhanced habitat must be **maintained and monitored for at least 30 years**

How are credits traded?

- **Off-site biodiversity units:**
    - The landowner can sell these independently, or team up with land managers (e.g. NGOs) to sell units as a group.
    - A habitat bank operator can help locate a buyer, legally secure land and register gain sites.

  - To locate buyers independently, look on the private market:
    - Search online
    - Consult land agents, brokers, consultants such as ABEC
    - Speak with developers
    - Speak with the LPA
    - Speak with habitat bank operators
  - Units are then sold between landowner and developer
  - Habitat gain sites must be registered, and the allocation of off-site units to the developer are recorded
- **Off-site statutory biodiversity credits:**
  - Developers buy these by applying to use the credit sales service provided by the UK Government.

What creates costs?

- Initial **creation and enhancement** of habitats: this will include costs for consultancy and ecologist service.
- **30-year management:** monitoring and reporting costs, insurance and remedial costs, people and machinery costs (including inflation).
- Unit prices are based on the costs required to enhance habitat and deliver the project (see points above), but these will **vary dependent on location and** will **vary with distance to development site**.
- There is a **mark-up on statutory credits to prevent prices undercutting the private market.**

How long is the scheme of funding for?

- Payment for units/funding of habitat enhancement for the mandatory 30(+) years can be paid in lump sum, staged payments, or be based on results.

What barriers are there?

- **Economic Barriers:**
  - Voluntary BNG requires **high set-up costs** which can be challenging for smaller landowners and NGOs.
  - There is a mismatch in t**imeline between demand for BNG sites and their development time**, this could deter investment.
- **Policy Barriers:**
  - There is a **governance gap for planning enforcement** on voluntary BNG projects. Low levels of staffing and standardised rules means that **LPAs**

may lack enforcement power when faced with violations in BNG activities.

- **Implementation Barriers:**
  - There's concern that **LPAs lack ecological expertise/staff capacity** to assess and monitor biodiversity enhancement projects.
  - **Coastal habitats are challenging to manage** particularly due to their dynamic nature.
- **Stakeholder Conflict Barriers:**
  - **Conflicting goals between stakeholders** (e.g. local landowners, local authorities and environmental agencies) could delay voluntary BNG projects.
  - There are **conflicting understandings of voluntary BNG metrics** which can undermine their integrity and could in turn deter investment.
  - **Competing interests over land-use priorities** (e.g. short-term economic benefit for agricultural, residential and commercial land development) might clash with long-term biodiversity project plans. Furthermore, some land-use options, such as renewable energy, might return a higher revenue for that site and therefore be favoured over BNG.
  - If there isn't a clear ecosystem service provision, and because funding is required for at least 30 years, it could be **challenging to encourage investment**. Additionally, **public perceptions of greenwashing** might deter or delay investments.

More information on BNG can be found here: Biodiversity net gain - GOV.UK

Projects Underway:

PV Nature: Biodiversity Standard for high-integrity biodiversity credits (voluntary BNG) developed by **Plan Vivo Foundation**. They are working with the **Solent Seascape Project** as a pilot for the new standard. The Solent Seascape Project aims to reconnect the 52,000 ha of coastal and marine habitats in the Solent. This will be achieved by creating a functioning seascape with improved scale, connectivity and condition of oyster reefs, seagrass meadows, saltmarsh and seabird nesting habitats. About PV Nature | Plan Vivo Foundation, Project - Solent Seascape Credit-where-credits-due1.pdf (page 25)

Nestle-owned Purina Europe is partnering with Oyster Heaven: this partnership aims to carry out native oyster restoration using biodiversity credits, this is happening within the UK. Home - Oyster Heaven and Purina Europe launches Ocean Restoration Program | Nestlé Global

The Sea the Value project: led by Plymouth Marine Laboratory, aims to quantify and assign economic and ecological values to marine biodiversity. This also covers carbon sequestration and bioremediation of waste. Sea The Value - Plymouth Marine Laboratory

Potential Implementation for TtTs

An established framework within the UK means that existing legislation is applicable to UK habitats. As a result, these established regulations, metrics, monitoring and management methods can act as a template for the developing intertidal BNG market. However, it is recognised that the revenue that BNG opportunities within the Thames Estuary can provide may be limited by the types of habitats within this area. Nevertheless, habitat such as saltmarsh, coastal grazing marsh, seagrass, native oyster reefs, coastal shingle and beach nesting bird habitats are all areas that could be explored for statutory and voluntary BNG work (statutory lending itself to intertidal habitats only

Marine Net Gain (MNG):

Key words:

Net gain: is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. This means protecting, restoring, or creating environmental features that are of greater ecological value to wildlife, habitats and people than any losses associated with the original project (Consultation on the Principles of Marine Net Gain.pdf).

Marine Net Gain (MNG): referring solely to statutory MNG, this is an approach to marine development that aims to leave the natural environment in a measurably better state than beforehand. MNG is going to be applied below the low water mark out into territorial waters. It will apply to developments and infrastructure in English Waters e.g. wind farm creation or aggregate sourcing.

MNG Assessment Framework: a statutory tool that will help developers and decision-makers measure the environmental impacts of a development.

What is MNG?

Who's involved?

	Involved in Development of MNG Framework and Policies	Involved in Implementation of MNG
Government Bodies	**Government agency UK Department for Environment, Food and Rural Affairs** (**DEFRA**) is leading the development of MNG policy and creating the MNG Assessment Framework. Within DEFRA the **Offshore Wind Enabling Actions Programme (WEAP)** is leading evidence projects, where the **Marine Biological Association** has been commissioned to define marine habitat irreplaceability and evaluate coastal and marine irreplaceable habitats. **Natural England** is supporting with policy development and evidence building for MNG.	**Governing Bodies** such as the **Marine Management Organisation (MMO)** and **The Crown Estate (TCE)** would be involved with managing and leasing the marine environment.
Industry Professionals and representatives	**Industry professionals and representatives** such as **offshore wind, energy, ports and fishing industry representatives** have participated in consultations and	**Various marine industries** will be involved in MNG implementation. It is still being finalised which industries MNG will apply to (e.g. fishers).

	are providing input on MNG principles (Summary of responses - GOV.UK). Those working with the marine environment are expected to be involved in shaping MNG policies and practices.	
Environmental organisations and environmental consultancies	**Environmental organisations and Environmental Consultancies** have shown significant interest in establishing MNG, contributing to the discussion and development of MNG principles. Howell Marine Consulting wrote the UK Marine Policy and Legislation Review for Implementing Marine Net Gain.	**Environmental organisations and Environmental Consultancies** will be instrumental in implementing MNG.
Developers		**Developers** will be required to follow MNG Assessment Framework. a. Developers of major developments b. Developers of small sites c. Developers of nationally significant infrastructure projects (required from November 2025) d. Land managers wanting to sell in the BNG market or a local planning authority
Academic and Research Institutions	**Academic and Research Institutions** are conducting studies to identify key considerations for implementing MNG policies, particularly in the context of offshore wind farms	**Academic and Research Institutions** will be fundamental in evaluating the efficacy of Marine Net Gain once it is implemented.

What can/can't be monetised?

Habitats and Species

MNG is proposed to apply to:

- **Impacts on both habitats and species**. Stakeholders largely supported assessment of both habitats and species to identify residual impacts of a development – thus achieving a whole ecosystem approach. Impacts on both habitats and species will be included in the MNG assessment framework.

Incorporating environmental benefits in MNG

- **Wider environmental net gain will be incorporated**, but only when underpinned by biodiversity enhancement. MNG interventions are proposed to be assessed with reference to environmental benefits that biodiversity enhancement can yield. Strong stakeholder support – government agrees that it aligns with nature first approach. Wider environmental net gain will be incorporated, but only when underpinned by biodiversity enhancement. Intended to support e.g. secondary considerations – important for mitigating and adapting to climate change such as carbon sequestration and storage and protection from flooding. Would provide opportunity to restore blue carbon habitats and build resilience to climate change.

Positive incidental effects

- **Unclear and undecided**. Mixed consultation responses. Better definitions required where there is significant uncertainty. Suggestions that there is already evidence to support inclusion of artificial reefs.

Contributions-based and metric-style approach

- **Not decided.** A **contributions-based approach** is still being considered however, viability of a biodiversity **metric-based approach** is also being explored. Would allow MNG to be set up quickly whilst the metric is still being developed.

Scope of MNG

- MNG will **most likely** be a **mandatory requirement** for new development activities within the marine environment. There are calls for greater clarity on implementation.
- MNG proposed to apply to **economic activities** that can be considered **'development.'** 'Development' would include **construction** or **installation** of **new infrastructure** (including significant extensions or improvements to existing infrastructure) or extractions (such as aggregates). There are still: differing views on minimum thresholds, suggestions to include spatial thresholds, similar to BNG approach and exclusion of all activities that are exempt or subject to self-service licences under Marine and Coastal Access Act (MaCAA 2009). **Fisheries** are **not included**.
- **Pressure reduction** is suggested to be included. In the first instance – active restoration: proven restoration or protection techniques. However, interventions or pressure reduction measures will be included where these offer opportunities. Fisheries are an in-scope activity for MNG, where these can remove or reduce pressures.

What monitoring and management is involved?

- MNG would be part of the **Development Consent Order (DCO)** which is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIPS) (ECOWind Policy Masterclass Series Marine Net Gain 2024)
- There are currently **no decided monitoring and management methods**. This is being developed and there are current projects within establishing robust monitoring methods.
- **Site-level and strategic approaches.** Developers will have the **flexibility** to propose meaningful site-based interventions.

What is the timeline?

There is **no timeline proposed** for its implementation, monitoring or management.

The **25 Year Environment Plan** is **driving** terrestrial and marine work to help the natural world regain and retain good health (25-year-environment-plan.pdf). A part of this work includes restoring and promoting diverse and sustainable oceans. By 2043, the aim is to secure clean, productive and biologically diverse seas and oceans. MNG is proposed as one of the main drivers of this, which means that its implementation is encouraged.

The **Environmental Improvement Plan** is also **driving** Marine Net Gain introduction.

For reference, the consultation for **BNG metrics** took place between January and April in **2022** and was implemented as a mandatory requirement in February **2024** for major developments and April 2024 for small sites. The current consultation stage for MNG is **establishing the principles.**

How are credits traded?

There are **no established ways** of selling and buying MNG credits yet, however, BNG credits are bought and sold in this manner:

- **Off-site biodiversity units:**
  - The landowner can sell these independently, or team up with land managers (e.g. NGOs) to sell units as a group.
  - A habitat bank operator can help locate a buyer, legally secure land and register gain sites.
  - To locate buyers independently, look on the private market:
    - Search online
    - Consult land agents, brokers, consultants
    - Speak with developers

        - Speak with the LPA
        - Speak with habitat bank operators
    - Units are then sold between landowner and developer
    - Habitat gain sites must be registered, and the allocation of off-site units to the developer are recorded
- **Off-site statutory biodiversity credits:**
    - Developers buy these by applying to use the credit sales service provided by the UK Government.

What incurs costs?

As MNG has not been established, costs will include:

- **Research and development to establish principles**
- **Funding of pilot projects**

With proposed plans for the MNG assessment framework, expected costs include:

- **Baseline habitat and species assessments** as well as **active restoration and pressure reduction**: this may include costs for consultancy and ecologist service.
- **Quantification and valuation of blue carbon credits without a standardised framework** will take time and therefore will have high costs.
- **Management and monitoring:** monitoring and reporting costs, insurance and remedial costs, people and machinery costs (including inflation). Given this is a marine environment, these costs will likely be high given the dynamic nature of the habitats and species, and technology required to reach them.
- Unit prices will likely be based on the costs required to enhance habitat or aim to improve conditions for species and to deliver the project (see points above), but these will **vary depending on location and** will **vary with distance to development site**.
- For BNG, there is a **mark-up on statutory credits to prevent prices undercutting the private market. This will likely apply to MNG as well.**
- **Here is a link to the final Impact Assessment of BNG**, which includes the latest policy updates, full economic costs and outlines why BNG was made mandatory rather than remaining voluntary: Net gain impact assessment.

How long is the scheme of funding for?

There are **no set guidelines** for this, however, for BNG the scheme is for the mandatory 30 (+) years.

What barriers are there?

- **Research barriers:**
  - There is a **lack of baseline data**. Habitats are constantly changing, and species are highly mobile making it difficult to establish a clear baseline where 'gain' can be evaluated.
  - **Methods of monitoring do not exist** yet; the dynamic nature of the marine environment further complicates this. Quantifiable and repeatable methods of monitoring must be in place for measures of MNG to be useful.
  - **Marine irreplaceable habitats** have not yet been outlined.
- **Economic barriers:**
  - **High costs** of establishing baseline data and monitoring methods is hindering the implementation of MNG. Further, the **restoration techniques** necessary to achieve gain may require **expensive technology and methods** to access the marine environment.
- **Policy barriers:**
  - There is a gap in regulation as **no clear mandatory policies** exist for MNG
- **Technical barriers:**
  - **Novelty of methods** of achieving marine net gain may be a barrier. MNG may require nature-inclusive designs which are still being developed

Projects underway:

Offshore Wind Enabling Actions Programme (OWEAP) have 3 evidence projects:

- MNG assessment framework to measure losses and gains
- Marine irreplaceable habitats mapping by April 2024: Marine Biological Association of the UK was commissioned by Natural England to define marine habitat irreplaceability and coastal and marine irreplaceable habitats (Defining Irreplaceable Marine Habitats - NECR474)
- Marine Restoration Potential (MaRePo+) is investigating habitats and species with potential for restoration, recovery and enhancement. The project aims to conduct market analysis and finalise and economic data project by March 2024 to contribute to an impact assessment. Refinement of this investigation is set to include constraints, climate change and species, by March 2025.

The Blue Forest Program: Research program to build evidence of restorative aquaculture as a natural capital solution. It is delivered and managed by algapelago, a mariculture and biotech company, and focuses on carbon drawdown, biodiversity uplift and the productivity and lifecycle of cultivated kelp.

Potential Implementation for TtTs

Currently, there are no regulatory frameworks existing for Marine Net Gain. The role of TtTs may therefore align with research and development projects to build evidence for MNG. Alternatively, TtTs could be a potential case study for the implementation of MNG. This lends questions of ownership of the Thames seabed and, in the case of implementation, whether the approach would be metrics or contributions based.

Blue Carbon:

Key words:

Blue carbon: refers to the biologically driven carbon fluxes and storage in marine systems that are amenable to management (IPCC 2019).

Carbon credits: Carbon credits are a tradeable certificate representing a measurable and verifiable emission reduction. These environmental credits represent the reduction, removal or prevention of release of carbon. They are measured in tonnes of carbon dioxide equivalent (tCO2e) and can be purchased by individuals or organisations.

Blue Carbon (credits): the term for carbon captured by the world's ocean and coastal ecosystems.

Coastal Blue Carbon: carbon stored in the vegetation and soils of mangroves, salt marshes and seagrasses.

Ocean Carbon: carbon stored in the world's oceans and in biomass found sub-tidally.

What is Blue Carbon?

Who's involved?

	Involved in Development of Blue Carbon Frameworks and Policies	**Involved in Implementation**
	All countries that have ratified or acceded to the Paris agreement are now involved in a global carbon market as of COP29. Agreement of Article 6.4 creates a global carbon market overseen by a **United Nations entity** (the UN Supervisory Body) (COP29 carbon markets standards will enhance integrity and investment). These countries will be key in developing frameworks and policies, especially on a global scale.	**All countries that have ratified or acceded to the Paris agreement** are now involved in a global carbon market as of COP29. Agreement of Article 6.4 creates a global carbon market overseen by a **United Nations entity** (the UN Supervisory Body) (COP29 carbon markets standards will enhance integrity and investment).
Global	**Blue Carbon Initiative (BCI)** which is co-organized by the I**ntergovernmental Oceanographic Commission IOC, Conservation International** and the	**Governing Bodies** such as the **Centre for Environment, Fisheries and Aquaculture Science (CEFAS)**, the **Marine Management Organisation (MMO)** and **The Crown Estate**

	International Union for Conservation of Nature (IUCN) are working on developing management approaches, financial incentives and policy mechanisms for ensuring the conservation, restoration and sustainable use of coastal blue carbon ecosystems (Blue Carbon | Intergovernmental Oceanographic Commission).	**(TCE)** would be involved in managing and leasing the marine environment.
	Industry professionals and representatives will be instrumental in developing management approaches and financial incentives.	**Industry professionals and representatives** will be instrumental in Blue Carbon projects. If selling UN approved carbon credits, project developers are required to register their project with the UN supervisory body.
	Environmental organisations and Environmental Consultancies will be able to share valuable information from previous carbon projects and have the resources to conduct pilot projects to help develop frameworks.	**Environmental organisations and Environmental Consultancies** will be instrumental in coordinating projects that aim to restore marine habitats that store carbon.
	Academic and Research Institutions are conducting studies to identify key considerations for establishing a blue carbon market. Such research will be fundamental in building a high-integrity market.	**Academic and Research Institutions** will be fundamental in evaluating the efficacy of Blue Carbon frameworks once implemented. Research will also be vital in ensuring high-integrity carbon markets.

What can/can't be monetised?

- **Coastal Blue Carbon** and **Ocean Blue Carbon** are in different stages of development and therefore, there is a **difference in monetization potential.**
- **Carbon credits** and **carbon offsets** are two different ways of funding carbon projects.
- A **carbon credit** works as a permit that 'allows' the holder to emit a certain amount of carbon dioxide emissions.
- A **carbon offset** is a means of compensating for emissions by funding an equivalent carbon dioxide saving elsewhere

- Terrestrial carbon credits must be **real, quantifiable, additional and permanent**. Therefore, this will most likely be the case for ocean blue carbon as well.
- Currently, **vegetated coastal habitats including mangroves, seagrass and saltmarshes** can be included in carbon projects as they are included in carbon market standards and methodologies. These have been developed using the best available science. Standards include: Verra's verified carbon standard and Plan Vivo. The most relevant of these habitats to the UK are seagrass and saltmarshes.
    - In the UK, carbon projects are based off 'codes.' Currently, there is a woodland carbon code, peatland carbon code and saltmarsh carbon code – these can all be used in carbon projects.
- Carbon stored in **subtidal marine sediments and kelp cannot be included i**n carbon projects as there are currently no carbon market standards available that can be applied to these.

	ECOSYSTEM/ BIOTA	SCALE OF GHG REMOVALS OR EMISSIONS ARE SIGNIFICANT	LONG-TERM STORAGE OF FIXED CO_2	ANTHROPOGENIC IMPACTS ON THE ECOSYSTEMS ARE LEADING TO C EMISSIONS	MANAGEMENT IS PRACTICAL/ POSSIBLE TO MAINTAIN/ ENHANCE C STOCKS AND REDUCE GHG EMISSIONS	INCLUDED IN IPCC GHG ACCOUNTING GUIDELINES	CLIMATE ADAPTATION VALUE
Actionable blue carbon ecosystems for mitigation	Mangroves	Yes	Yes	Yes	Yes	Yes	Yes
	Tidal marshes	Yes	Yes	Yes	Yes	Yes	Yes
	Seagrasses	Yes	Yes	Yes	Yes	Yes	Yes
Emerging blue carbon ecosystems	Macroalgae	Yes	Yes	Yes	Yes	No	Yes
	Seafloor sediments	?	Yes	Yes	?	No	?
	Mud flats	?	?	Yes	?	No	Yes
Other ocean ecosystems (not actionable)	Coral reefs	No	No	No	No	No	Yes
	Oyster reefs	No	?	No	No	No	Yes
	Phytoplankton	Yes	?	?	No	No	No
	Marine fauna (fish)	No	No	Yes	No	No	Yes

Notes: C = carbon; CO_2 = carbon dioxide; GHG = greenhouse gas; IPCC = Intergovernmental Panel on Climate Change.

Sources: Lovelock and Duarte (2019); Pidgeon et al. (2021).

Figure 3. Table assessing which coastal ecosystems (habitats and species) meet the blue carbon criteria ('yes' or 'no') and which require further scientific or policy investigation (?). Credit: (Ocean_Panel_Blue_Carbon_Handbook-1.pdf)

What monitoring and management is involved?

Methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes, and seagrass meadows have been outlined by the blue carbon initiative in this handbook (English_Blue_Carbon_LR_190306.pdf)

What is the timeline?

For **carbon credits,** the project needs to last so that the **carbon storage, reduction or removal** is **'permanent'** which is classified as **100 years. Blue carbon credits** would be expected to require a similar 'permanency'**.**

Currently, there are 5 steps to carbon credit issuances, for an established high-integrity blue carbon market the amount of steps may increase:

- **Pre-feasibility study**
- **Project viability**
- **Planning**
- **Project Development and Implementation**
- **Ongoing Project Operation**

A current woodland carbon credit project sold on the government compliance market roughly follows this timeline:

1. **Pre-application –** registration with the Woodland Carbon Code (WCC) and calculation of how much carbon your woodland will sequester (Carbon Calculation Spreadsheet and Guidance from the WCC website).
2. **Application –** submitting a Woodland Carbon Guarantee application form (Woodland Carbon Guarantee application form)
3. **Auction –** the woodland carbon project will be put up for auction. In **2024** the eighth auction took place in **September**
    a. If the project is successful at auction, then a conditional **30 to 35 year** contract is offered. You can view a sample participant contract.
4. **Validation – the contract offer is conditional until validation is secured**
5. **Verification –** verification of the woodland will take place every 5 or 10 years. There is an option to sell verified credits to the government for a guaranteed price or sell them privately on the open market.

Woodland Carbon Guarantee (WCaG) contracts only cover the carbon sequestered for the first 30 to 35 years. Contract length will be determined on the starting year as all contracts end in 2055-2056.

How are credits traded?

Carbon credits are bought and sold o**n compliance or voluntary markets.**

- Compliance markets – in these markets **carbon credits** can be bought and sold as **units from the government** based on a **cap-and-trade market.** Governments have then capped emissions and businesses must comply. **Carbon credits s**old within this market are **regulatory compliance credits.**
- **Voluntary markets - Carbon offsets** can be bought and sold on the **voluntary carbon market. These are voluntary offsets.**
- How units can be bought and sold are **specific to the habitat.** The Woodland Carbon Code and Peatland Carbon Code are already established. **A Saltmarsh Code and a Seagrass Code is being established. No oceanic habitat code has been established.**

What incurs costs?

As blue carbon is currently under development, costs will include:

- **Research and development of principles**
- **Funding of pilot projects**

Once blue carbon is established, costs are likely to include:

- **Baseline habitat condition assessments** as well as **storage, removal or** of habitats: this will include costs for consultancy and ecologist service.
- **Quantification and valuation of blue carbon credits without a standardised framework** will take time and therefore will have high costs. There are blue carbon projects that exist without a standardised framework, but this has led to questions of integrity.
- **Management and monitoring:** monitoring and reporting costs, insurance and remedial costs, people and machinery costs (including inflation). Given this is a marine environment, these costs will likely be high given the dynamic nature of the habitat types and technology required to reach them.

How long is the scheme of funding for?

There is **no established timeline for blue carbon projects**, and the ones established for terrestrial projects vary depending on the habitat.

- For **example**, **a woodland carbon unit** sold to the **government compliance market** will be **funded for every 5 or 10 years up to 2055-2056**. The woodland carbon units **can then be sold on the voluntary carbon market** after this.
- **Woodland carbon units** can also be sold on the **open-market** where the scheme of funding may be different. An example of this is the woodland carbon units sold to the woodland carbon trust. Depending on the size of the project, the seller receives up to 70% of the agreed value of units in Pending Issuance Units as soon as the project has been validated. 15% of the value is then paid at the first successful progress report at 5 years and the final 15% at the 15-year progress report (Woodland Carbon: Farmers and Landowners - Woodland Trust).

What barriers are there?

- **Research barriers:**
  - There are research gaps in identifying **carbon stocks** and establishing how much carbon is stored in each stock within each habitat. There is also a difference in **carbon stored** in the **soil** and **biomass**.
  - There is a lack of evidence surrounding **eligibility, additionality, permanence and leakage** of blue carbon projects. Coastal blue carbon focuses on the carbon stored in the roots and sediment as these have high carbon burial rates. However, if degraded or lost, these ecosystems are likely to release their carbon back into the atmosphere. This is leading to debates on the **longevity and integrity** of such projects.
  - There are **questions regarding application of the blue carbon concept** to other coastal and non-coastal processes and ecosystems, including **macroalgae and the open ocean** (IPCC 2019).
  - It is **challenging to quantify and value carbon storage**, especially in a marine environment – this will **require trained and skilled individuals, and specific technology** meaning high costs.
- **Policy barriers:**
  - There is **no standardised regulatory framework** for blue carbon credits. This means that it **takes a lot of time and people power** to create high-integrity credits, creating **high costs**. This might mean that habitat creation/restoration/enhancement **projects need to be collaborative** to meet up-front costs.

- **Implementation barriers:**
    - There are **no set guidelines on monitoring**, this will take time, peoplepower and costs to work out a high-integrity approach.
    - **Marine habitats** (e.g. seagrass or saltmarsh) **are dynamic sites** where carbon storage capacity will vary over time. This means credits are difficult to value and sell given their natural variability. This **uncertainty of return on investment might deter investors**.
    - As additionality is a requirement of blue carbon projects, they face the unique challenge of proving this in areas where there is already effective management (e.g. MPA's)
    - **Lack of public/stakeholder awareness** might limit investment engagement.
- **Ethical barriers:**
    - Carbon credits have lost integrity due to a scandal with the certifier Verra. The credits they sold overestimated the amount of carbon stored via avoided deforestation.

Projects underway:

Blue Carbon report establishes: Blue Carbon habitats, their associated **carbon capture rates** and **carbon stocks** and the **threats** they face (Blue-Carbon-UK-Report_Final-1.pdf)

The Saltmarsh Code is being established: This would be used to facilitate **measurement, reporting and verification** of climate change mitigation benefits from saltmarsh restoration in terms of carbon stored (Saltmarsh Code | UK Centre for Ecology & Hydrology). The Saltmarsh carbon code will include **scientifically based voluntary certification standards** leading to confidence in purchasing carbon credits based on saltmarsh

There is an **ongoing blue carbon project** in **Pakistan**. The **Delta Blue Carbon Project** is aiming to protect and restore 350,000 hectares of tidal wetlands on the south-east coast of Sindh in Pakistan.

Delta Blue Carbon – Mangrove Restoration In Sindh – Delta Blue Carbon – Mangrove Restoration In Sindh

Potential Implementation for TtTs

A framework exists for carbon credits but has not been established for blue carbon in the UK. Working across the reputable partner organizations, TtTs could be a potential pilot project for blue carbon. This would require science-backed actions,

that would aim to rebuild a high-integrity market. With the UN establishing a Supervisory Body for carbon credits there is potential to influence how this is implemented.

Blue Nutrients:

Key words:

Blue Nutrients: Environmental credits that account for the capture and storage of excess nutrients such as excess nitrogen or phosphorous.

Nutrient Neutrality: When a development mitigates the excess nutrients that it would introduce via wastewater into the environment.

Water Catchment Area: The area of land which water rains from before flowing downstream into rivers/lakes/the sea.

Nutrients vs Nitrogen: Nutrients is an umbrella term that includes excess nutrients such as Nitrogen or Phosphorous. 'Nutrient credit' is used in this document to include all nutrient types.

NOTE Natural England has created a Nutrient Mitigation Scheme, but this applies mainly to freshwater habitats. It focuses on reducing excess nutrient flow before it enters the marine environment, e.g. preventing agricultural run-off, constructing/restoring wetlands or creating buffer zones within a catchment area. However, this means there isn't an established blue excess nutrient credit framework for intertidal and marine ecosystems.

What are Blue Nutrients?

Who's involved?

	Involved in Blue Nutrient Framework and Policies	**Involved in Blue Nutrient Implementation**
Government Bodies	The **Government** is involved in producing legislative and policy frameworks, e.g. Natural England has created the Nutrient Mitigation Scheme which has created a standardised mechanism for nutrient credits for freshwater habitats. This involves **DEFRA, DLUHC** (Department for Levelling Up, Housing and Communities), **the Environment Agency** etc. Overall, **Natural England** and the **Environment Agency** are involved in conserving and monitoring the environment- which includes	Currently, **Natural England** is involved in running the Nutrient Mitigation Scheme which sells statutory nutrient credits. Along with the **Environment Agency**, they will likely also be involved in removing excess nutrients from marine ecosystems. **Governing Bodies** such as the **Marine Management Organisation (MMO)** and **The Crown Estate (TCE)** would be involved with managing and leasing the marine environment.

	controlling excess nutrient levels in marine ecosystems.	
Local governing bodies	LPAs will incorporate Blue Nutrient policies into local plans – this is already seen with the Nutrient Mitigation Scheme in the Poole Harbour and Tees Catchment.	**LPAs** and **Landowners** would be involved with planning applications near or on marine and coastal habitats.
Environmental Organisations	Environmental NGOs, e.g. the **Wildlife Trusts**, will work with governing bodies to help develop policies and standards for the marine and coastal environment.	**Environmental Organisations** and **NGOs** are involved in managing and facilitating small/regional-scale blue excess nutrient/restoration pro
Industry		**Private Sector Buyers** and **Developers** are involved in buying excess nutrient credits as part of mitigation processes. This could be property developers, the agricultural sector, water companies or other coastal/marine industries. **Investors** can get involved by funding biodiversity creation/restoration projects as a way of generating units to offset emissions.

What can/can't be monetised?

- Projects that **create, restore and enhance habitats and their ability to store excess nutrients** can generate nutrient credits which can then be sold. In a blue finance context, this includes estuaries, coastal wetlands and marine habitats.
- **Protected sites in unfavourable condition** are prime sites for environmental improvement, which includes reducing excess nutrient pollution. Projects taking place within these areas can be monetised, however they may need the approval of Natural England to take place on certain protected sites.
- Landowners can agree land will deliver nutrient gains through a **conservation covenant**. Credits generated through this agreement can be monetised
- Nutrient credits **can be combined with biodiversity unit creation** activities.
- In line with (terrestrial) nutrient credit guidelines, habitats, and the nutrient credits within, must be maintained for a minimum of 80-125 years. Therefore, **temporary gains** without long-term management plans **cannot be monetised**. It is unlikely temporary gains will be allowed in marine habitats either.
- **Activities that indirectly reduce excess nutrient** levels do not have clearly quantifiable outcomes and so are **difficult to monetise**.
- **Natural systems** which remove excess nutrients **without human intervention** (e.g. enhancement/creation of habitat) **cannot be monetised**.
- For terrestrial nutrient mitigation, **credits must be bought/sold within the same water catchment area.**

What monitoring and management is involved?

There is no standardised national framework for blue nutrient credits, therefore there isn't an established process for monitoring and management. However, based on terrestrial processes, the following actions will be likely:

- **Baseline ecological assessments** to quantify habitat condition would be required.
- **Continuous monitoring** to quantify and value nutrient storage, as well as habitat condition, would be needed to create and sell credits. Terrestrial sites require monitoring for a minimum of **80-125 years**.
- A **HMMP** (Habitat Monitoring and Management Plan) is required legal agreement that states:
    - How habitat will be maintained
    - Who is responsible for creation/enhancement of the habitat
    - Who is responsible for monitoring, maintenance and management of the habitat
    - When and how you'll report monitoring results
    - When and how you'll review management proposals
    - How you will amend management to achieve biodiversity net gain
- **LPAs have the responsibility of planning enforcement powers,** this means they would monitor activities from the application to the management stage, making sure there are no violations of the planning conditions. As this is in a marine environment, and there is no standardised framework for local authorities to follow, it is likely that the **MMO** and **EA** would also share these responsibilities.

What is the timeline?

There is no established timeline for blue nutrient projects, however terrestrial sites using the Nutrient Mitigation Scheme roughly follow:

    - Expression of interest = **4 weeks**
    - Credit certificate is issued to developer, signed by Natural England and forms part of planning application to LPA. Permission given = **36 weeks**
    - Purchase of credits = **12 weeks**
    - Final credit is issued
- Other (simplified) steps could be included:
    - **Site selection and feasibility:** baseline ecological surveys (seasonally dependent) on the site and consider options for habitat restoration/enhancement
    - **Site design:** includes pre- and post-development nutrient value calculations, as well as monitoring/management plan designs.

- **Securing and registering land:** involves LPA/EA/NE/MMO/TCE etc.
- **Sale and registration of nutrient credits** to a developer
- **Habitat creation and enhancement**
- Enhanced habitat must be **maintained and monitored for a minimum of 80-125 years**

How are credits traded?

Terrestrial statutory nutrient credits can be bought through Natural England's Nutrient Mitigation Scheme by applying for their credit release rounds. As there is no such scheme for blue nutrient credits, it is likely that transactions would involve:

- Environmental NGOs/land-owners/land managers
- Consultants/land agents/brokers
- Habitat bank operators
- Developers
- Environmental regulatory bodies and agencies

What incurs costs?

- **Baseline habitat condition assessments** as well as **creation and enhancement** of habitats: this will include costs for consultancy and ecologist service.
- **Quantification and valuation of nutrient credits without a standardised framework** will take time and therefore will have high costs.
- **80-125 year management and monitoring:** monitoring and reporting costs, insurance and remedial costs, people and machinery costs (including inflation). Given this is a marine environment, these costs will likely be high given the dynamic nature of the habitat types and technology required to reach them. This is also a very long period of management and monitoring which will also create high costs.

How long is the scheme of funding for?

Habitats generating credits/being funded for habitat enhancement for terrestrial nutrient credits are maintained for 80-125 years. Credits are paid for in a lump sum within 28 days of agreement. There are no guidelines for marine nutrient credit projects.

What barriers are there?

- **Policy Barriers:**
  - There is **no standardised regulatory framework** for blue nutrient credits.
  - There are **no set guidelines on monitoring**, this will take time, peoplepower and costs to work out a high-integrity approach.
- **Economic Barriers:**
  - As there is no standardised framework, it **takes a lot of time and people power** to create high-integrity credits, creating **high costs**.
  - In the terrestrial framework, statutory nutrient credits must be bought from within the affected catchment area. Marine nutrient **credits might be less attractive to buyers given they are at the sink point and outside/at the edge of a catchment area**. In this way, they do not seem a priority compared to mitigating excess nutrient pollution nearer the source.
  - **Lack of public/stakeholder awareness** might limit investment engagement.
- **Research/Technical Barriers:**
  - It is **challenging to quantify and value nutrient storage**, especially in a marine environment – this will **require trained and skilled individuals, specific technology** meaning high costs.
  - **Marine habitats** (e.g. seagrass or saltmarsh) **are dynamic sites** whereby nutrient storage capacity will vary over time. This means credits are difficult to value and sell given their natural variability. This **uncertainty of return on investment might deter investors**.
- **Implementation Barriers:**
  - In order to meet high up-front costs, this might mean that habitat creation, restoration, and enhancement **projects need to be collaborative** which could delay project development.

Projects Underway:

Natural England's Nutrient Mitigation Scheme is the only current framework of its kind within the UK. It aims to reduce excess nutrient flow into and out of water catchments by preventing leaching and enhancing habitats. At the time of writing, there are **no projects that aim to enhance marine habitats for the sole purpose of creating and selling nutrient credits**. However, **multiple projects** aim to create, restore and enhance habitats which will **contribute to sequestering excess nutrients**. For example:

Life Recreation ReMEDIES: a **5-year marine conservation partnership project** to Save Our Seabed at five Special Areas of Conservation in southern England. This included Seagrass restoration. Project overview - Save Our Seabed

Pilot project of seagrass restoration in Dale, Wales, by Project Seagrass, Swansea University and Pembrokeshire Coastal Forum: aims to restore a healthy seagrass meadow. This pilot was completed in 2020, and monitoring continues today. Dale - Project Seagrass

SEAWILDING: a community-led native oyster and seagrass restoration project in Scotland (Loch Craignish, Argyll and Loch Broom, and Wester Ross). Seawilding | Native Oyster and Seagrass Restoration, Scotland, United Kingdom

Wilder Humber: a 5-year programme aiming to restore marine habitats and species throughout the Humber Estuary. This involves planting seagrass, saltmarsh and creating a biogenic reef by introducing native oysters. Work is the product of collaboration between **Ørsted, Lincolnshire + Yorkshire Wildlife Trust**. Wilder Humber | Lincolnshire Wildlife Trust

Potential Implementation for TtTs

An established framework within the UK means that existing legislation could be used as a template for the developing marine environment. However, it is acknowledged that this requires significant research to adapt methods to dynamic marine habitats. Nevertheless, habitats such as saltmarsh, coastal grazing marsh, seagrass and native oyster reefs are all areas that could be explored for Blue Nutrients. Working with water companies as potential collaborators could help drive projects. This could engage new sectors by not only highlighting the importance of protecting the environment for species, but also for humans, e.g. improving bathing water quality. Emphasising the different users of the environment could encourage interdisciplinary collaboration, and potentially wider investment.

Additional Opportunities for Blue Finance:

In addition to the main nature-based solutions discussed above, other mechanisms have been identified as potential opportunities for sustainably generating income, or ways of aiding this process. As these are emerging ideas, they are discussed briefly below as potential future areas of development for the TtTs project:

Flood risk management and insurance possibilities:

It has been identified that the creation, restoration and enhancement of certain habitats, such as saltmarsh and seagrass, could have multiple benefits. Not only can these habitats increase biodiversity or sequester carbon and excess nutrients, but they could also contribute to flood-risk mitigation. This is because these habitats create buffer zones and reduce wave energy. Investing in such habitats would therefore benefit communities and livelihoods by protecting homes, infrastructure and agricultural land. Overall, this can contribute to urban resilience and is a powerful reason to engage more stakeholders with investing in nature restoration. Recent papers have explored the co-benefits of nature restoration: Can salt marshes cut flood prevention costs? - British Ecological Society and Harnessing-Englands-Biodiversity-Net-Gain-legislation-to-amplify-urban-flood-risk-management.pdf.

Elsewhere in the world, nature-based insurance policies have been trialled. In 2017, The Nature Conservancy (TNC) developed a coral-reef insurance policy in Quintana Roo, Mexico. This aims to provide rapid funding for coral-reef repair after major storms or hurricanes, which are becoming increasingly frequent. This is funded by the Coastal Zone Management Trust, which was set up by the state government and supported by TNC. Revenues are then paid by beach-front property owners and hotels. The collaboration with a variety of stakeholders ensures rapid nature recovery, which in turn reinforces natural coastal flood barriers, therefore helping to protect urban sites long term. Please see this article for more information: A Unique Nature Insurance Policy Aims To Protect Mexico's Mesoamerican Reef - Sacred Groves. This is another example highlighting how coastal communities can benefit from marine habitat restoration and protection.

Incorporating social impact investment:

Another potential funding avenue for TtTs is impact investing. Impact investing aims to generate financial return whilst also aiming to create a positive impact on the environment, society and economy. There are different approaches to this type of investment. One example is the Esmee Barn Foundation allocating capital by first evaluating what the society or the environment may need and then tailoring the investment accordingly. Alternatively, there is place-based impact investing

Place-based impact investing | Impact Investing Institute. Through investing impact capital in underinvested areas, this has effectively raised living standards, built economic opportunity, and fostered thriving communities.

Impact investing in nature can be a form of implementing nature-based mechanisms using different forms of investment to credits. Nature-based mechanisms and the habitats they aim to restore are inextricably interlinked with the prosperity of communities. For example, the current biodiversity crisis threatens both our livelihoods and well-being. To develop the green/blue economy, the government has released the Green Jobs Plan, setting out the objectives to encourage and fund green skills in order to reach goals of halting population decreases by 2030 (IEMA sets out 18 policy asks for the next Government). Thus, projects working to enhance biodiversity are directly working for environmental, social and governance (ESG) objectives (Biodiversity and Infrastructure Investing: How Infrastructure Investors Are Factoring Biodiversity Impacts Into Decision-Making | Publications | WWF). Ultimately, impact-investing is a valuable option to fund habitat restoration and encourage thriving communities.

Concluding remarks:

This report has identified a wide variety of Blue Finance opportunities that could be applied to the TtTs project in the south-east of England. The blue finance mechanisms above are in different stages of development. Where standardised frameworks exist for terrestrial credits, it provides a template for the development of such opportunities in the marine sector. Additionally, an existing framework facilitates consistent and high-integrity environmental credit creation within the sector. However, it has been identified that there is lacking people-power and ecological expertise at a local level, acting as a barrier to high-integrity monitoring and management.

Although there is great appetite for less-developed mechanisms (e.g. MNG), it is acknowledged that large research and knowledge gaps are still existing. This can limit market growth and implementation due to uncertainty and high costs whilst creating high-standard environmental credits. Consequently, identifying knowledge gaps and barriers will steer research needed to inform developing regulations and legislation.

Overall, the TtTs project offers an exciting opportunity to expand mechanisms such as BNG into the coastal and intertidal landscapes. It also has the potential to act as a pilot

study trialling developing mechanisms, such as Blue Nutrients or MNG, within a seascape-scale restoration project. This guide offers an accessible brief analysis of such Blue Finance opportunities which could act as a springboard for future work in the TtTs Project.

A final note on the intrinsic vs. instrumental value of nature…

As the environmental credit market develops, it is crucial to consider the ethics of Blue Finance going forward. Keeping this in mind can ensure that high-integrity markets are created and upheld across the sector.

Greenwashing (or bluewashing in this case) refers to the misrepresentation of business practices, products or services as more environmentally–friendly or sustainable than they in fact are. Within a developing Blue Finance market, bluewashing could deter investment and risk losing stakeholder and partner engagement due to loss of trust. To avoid this, projects should be transparent about decision-making or metrics used. Collaboration and shared responsibility within these projects can help with accountability, reinforcing trust and minimising the risk of bluewashing.

It is important that Blue Finance mechanisms provide an equitable distribution of benefits between stakeholders involved in projects. It is necessary to evaluate how we define value in this case. Whether this is the economic value or the intrinsic value linked to ecosystem services, livelihoods and well-being. This includes investors, the marine environment and local communities. A fair spread and access to benefits is not only important in itself, but it also establishes trust and strong engagement between stakeholders. This can be brought about by, and encourage collaboration.

Confirming that sources of investment come from reputable sources is vital in developing high-integrity Blue Finance markets. This can be achieved through due-diligence practices or verification and eligibility processes. Such processes have been used within Wilder Carbon governance framework: Wilder Carbon Verification Partners.

Underlining these practical Blue Finance considerations is considering both the intrinsic and instrumental value of nature. The intrinsic value of nature represents the value of nature in and of itself, whereas the instrumental value of nature considers the value humans are provided with by nature (e.g. ecosystem services). However, it is critical that there is a balance between acknowledging and harnessing the benefits the marine environment provides (blue spaces for recreation, food, flood protection etc.) and respecting the importance of protecting and enhancing nature for nature's sake. Overemphasising the instrumental value of nature might lead to bluewashing and exploitation of the marine environment. If habitats are viewed merely as carbon stores,

instead of considering the functionality of an entire ecosystem, this may jeopardise their biodiversity levels. In contrast, although recognising the intrinsic value of nature is crucial, without measurements and prioritisation of the natural environment, there would be an inadequate basis for the funding of conservation and restoration projects.

Understanding and achieving this balance will allow us to create ethical and sustainable Blue Finance opportunities to fund successful nature restoration projects. These will benefit both marine habitats and ecosystems, as well as marine communities at a local and seascape scale.