

Business in the Blue Economy

Summary

A conference exploring natural capital approaches to help marine industries deliver Scotland's Blue Economy Vision

Held on Monday 27th February 2023

at
Parliament Hall
University of St Andrews

The marine realm is the largest component of the Earth's system that stabilizes climate and supports life on Earth and human well-being.
(UNESCO)

Sponsored by Howell Marine Consulting

Contents

Keynote Address

Professor Matthew Williams, Chief Scientific Adviser - Environment, Natural Resources and Agriculture, Scottish Government

Session 1

Evidence and Policy Drivers

[Making the most of the Blue Economy](#) - Professor Sir Ian Boyd, Co-chair Scottish Government Environmental Council

[Private Investment in Natural Capital – the Scottish Context](#) - Ross Johnston, Head of Natural Capital Valuation and Policy, Scottish Government

[Scotland's Marine Natural Capital approach: The Story So Far](#) - Claire Speedie, Senior Policy Officer Blue Economy, Marine Scotland, Scottish Government

[Elsewhere in the UK and Beyond](#) - Vicky Morgan, Leader, Marine Natural Capital at JNCC

[Insights from Land](#) - Kerry Waylen, Research Lead in Environmental Governance at James Hutton Institute

Session 2

The Essential Elements to Enabling Change

[Introduction](#) - Dr Hannah Rudman, Co-director, Thriving Natural Capital Challenge Centre at Scotland's Rural College (SRUC)

Industry with Ambition: Case studies

[The Glenmorangie Company](#) - Hamish Torrie, Director of Corporate Social Responsibility

[Scottish Water](#) - Mark Williams, Head of Sustainability and Climate Change

[Collaborating for the Blue Economy](#) - Samir Whitaker, Biodiversity Lead Specialist, Ørsted

[The Future of Fishing](#) - Hannah Fennell, Head of Orkney Fisheries Association, Vice President of Scottish Fishermen's Federation

Session 3 Enabling Actions

[Enabling Actions](#) - Dr Lucy Greenhill, Head of Blue Economy Policy and Practice at Howell Marine Consulting

[Scotland's Blue Economy: Current Status](#) - Amy McQueen, Senior Economist and Head of Marine Analytical Unit at Marine Scotland, Scottish Government and Peter van der Meulen, Economic Adviser - Marine Analytical Unit at Marine Scotland, Scottish Government

[Measuring and Assessing](#) - Hannah Rudman, Co-director Thriving Natural Capital Challenge Centre, Scotland's Rural College (SRUC)

[Embedding in Policy and Practice](#) - Cathy Tilbrook, Head of Sustainable Coasts & Seas, NatureScot

[Investing Responsibly](#) - Christine Rolin, Senior Project Manager Blue Economy, Highlands and Islands Enterprise

[Stimulating Investment in Marine Nature](#) - Sarah Brown, Manager, Scottish Marine Environmental Enhancement Fund (SMEEF)

World Economic Forum research in 2020 estimated US\$44tn of economic value generation is moderately or highly dependent on nature.



Keynote address

Professor Matthew Williams

Chief Scientific Adviser - Environment, Natural Resources and Agriculture, Scottish Government

Economic transformation

- Scotland's marine assets include seafood, coastal protection, beauty and wellbeing provision
- We have a responsibility to manage protect and enhance the value of our natural assets to reverse the damage from the pressures of climate change
- The Dasgupta report indicated we'll need 1.6 worlds if we continue at the current rate of consumption. We need long term value creation and financial stability to balance the social, environmental and financial interests, and the Blue Economy Vision provides this for Scotland
- Through the Scottish Biodiversity Strategy and the National Strategy for Economic Transformation (NSET) which accounts for nature in an economic model to move to a wellbeing economy
- We need to redesign the economy to protect nature, the NSET targets include rebuilding natural capital by 2032 along with the social dimension - for people to share in benefits, including physical and mental health

New tools

There is confidence that assessments of coastal and marine assets can be developed to track broad trends through the Natural Capital Asset Index (NCAI).

The CivTech challenge 8.6, innovate for nature challenge solutions include creation of Nature Networks, flexible management of marine protected areas and using technology to assess and identify opportunities for investment.

Research partnerships are providing policy tools to track the impact of decisions on ecosystem services and the blue economy approach is making marine policy adaptive.

Business partnerships recognise dependency on intact natural capital, and are measuring and valuing impacts and dependencies, empowering businesses to deliver benefits to society, the broader economy and the natural world.

We need to drive joint action via investment partnerships to deliver a wide range of environmental, economic and social policy priorities for a high integrity, values-led just transition, involving and benefiting communities.

"We are at a crucial juncture to change the policy landscape."

Multi-partner action

A partnership approach is needed with investment, policy and the research agenda, to enable evidence-based actions, policy development and decision-making frameworks. The natural capital concept is evolving along key threads:

- Long term economic sustainability
- Social equity
- Circular economy
- Fair access to benefits

Understanding synergies requires multi-partner action with the public, private and voluntary sectors. New approaches can support marine industries and livelihoods. Innovation funded by the Rural and Environment Science and Analytical Services Division (RESAS) includes strategic research into natural capital valuation, natural capital accounting of climate change impacts and land use trend modelling. Research similar to the [Oceans of Value](#) lived experience project can also capture the value placed on the marine environment.

"Creating a shared understanding is the foundation of new partnerships, new research and Innovation, and joint action"

Marine and terrestrial synergy

Terrestrial natural capital approaches are further developed than marine, with relatively mature evaluation tools at a national level such as the NCAI, one of the National Performance Framework (NPF) economy indicators, demonstrating assets worth £206bn in 2018, although soils as well as marine assets are not yet included. According to the Office of National Statistics (ONS) data, the value of UK marine assets is estimated as £211bn. Capturing the interconnections and transfers between terrestrial and marine system boundaries is important but there is a lack of data currently available.



Making the Most of the Blue Economy

Professor Sir Ian Boyd, Co-chair Scottish Government Environmental Council

Fundamentals we need to get right to attract private investment into natural capital:

Understanding the difference between public and private goods

Private Good – traded within a market

Public Good – governments are responsible for turning assets from public to private goods to raise money against them, need to ensure there's a cash flow.

Marine assets – e.g. fish stocks are publicly owned, leased to fishermen to turn into a cash flow

Government can issue and pay back through bonds and tax revenues, using private finance to make progress.

We live off the flows from natural assets so we need to optimise natural capital.



University of
St Andrews

"Capital flows in the private sector need standards to recognise value."

Consistent measurement and clear definitions of natural capital

- Measurement – consistent standards need to be agreed and recognised globally.
- Natural assets have transboundary issues, but there is progress on measuring biodiversity and credits.

Private Investment in Natural Capital – The Scottish Context

Ross Johnston, Head of Natural Capital Valuation and Policy, Scottish Government

Natural capital markets – policy background

How the Scottish Government are addressing challenges to natural capital market development and delivering benefits:



Scottish Government
Riaghaltas na h-Alba
gov.scot

1. **Longstanding commitment to a natural capital approach** - investing in nature to deliver multiple benefits. Long history in Scotland exploring natural capital - the first World Forum on Natural Capital was held in Scotland in 2013 - and is an expression of the importance of nature to Scotland's brand and the scale of international interest in the land.
2. **Large scale public investment in nature-based solutions** – such as peatland restoration and woodland creation. The concept is about getting public investment and policy to consider the value of nature. Significant investment in nature-based solutions for climate change, £250m over 10 years in peatland restoration, £40-£50m into woodland creation.
3. **Public funding gap to achieve policy aims for nature at land and at sea** - Green Finance Institute estimates £20bn is needed over 10 years, which emphasises the scale of the economic opportunity for supply, jobs and skills etc., if the right kind of investment is attracted.
4. **Greater awareness of opportunities and risks** - There's an increasing understanding of the need to balance the opportunity from securing private investment in nature with the risk that inappropriate investment leads to adverse impacts on communities and wider policy ambitions. We also need to understand that investors aren't all the same, there are a variety of motivations at different scales e.g. local investment to mitigate impacts on business, offsetting carbon emissions, investment as part of brand obligations or as part of development e.g. SMEEF funding from marine renewables.
5. **Building the underpinning detail in the aspiration** - Scottish Government is committed through the National Strategy for Economic Transformation to developing a wellbeing economy. This commitment includes the restoration of our natural capital and the development of a market for private investment in natural capital - but this private investment must be values led, high integrity and responsible. The Interim Principles for Responsible Investment in Natural Capital set out this market vision in more detail. These Principles are supported by other policy areas such as Land Reform and Community Wealth Building.

"The market must be ethical, and values led – the Interim Principles for Responsible Investment revealed high integrity positioning is more attractive to investors, as it decreases risk.

Setting the bar high is a sound economic, and as well as social objective".

Private Investment in Natural Capital – The Scottish Context

Ross Johnston, Head of Natural Capital Valuation and Policy, Scottish Government

...continued

Motivations that drive investment

Some philanthropic investors but most looking for commercial return from benefits. We want to develop an investable proposition and market mechanism to secure private investment and help drive assets towards becoming mature and established tradable commodities.

Marine flows and benefits are concepts to be tested. Peatlands model needs improvements to achieve scale and impact. Forestry is a mature market, but is continuously under review to align with public investment.



Scottish Government
Riaghaltas na h-Alba
gov.scot

“The voluntary carbon market is currently valued at \$2bn globally, estimated to escalate to \$200bn by 2050.”

The voluntary carbon market is currently valued at \$2bn globally, estimated to escalate to \$200bn by 2050. Scotland only needs to achieve a small proportion of this investment for positive management of our nature. Scotland gets a disproportionate amount of investment from the Peatland Code and Woodland Carbon Code, these models can be extended elsewhere.

“It’s a long-term process but we know the steps to deliver mature markets for ecosystem benefits”.

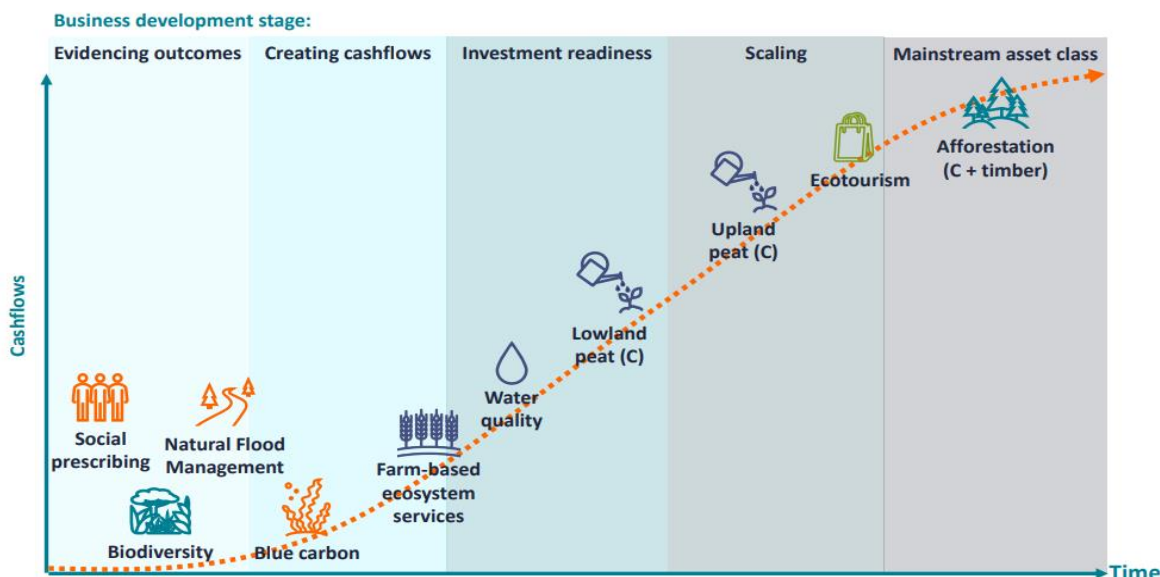


Figure: Finance Earth, Business development stages

The How

- **Team Scotland:** A broad public sector partnership - including Highlands and Islands Enterprise and NatureScot, involved in contributing to this work. Widening to include private businesses and NGO sector to access all expertise.
- **Cross portfolio:** More engagement representing businesses into discussions and engagement.
- **Shared leadership:** Workstreams looking at different aspects of market development.
- **Collaborative:** Actively working with UK and Welsh governments to develop standards e.g. Defra and BSI developing natural capital standards including marine, technical aspects will be shared.
- **Enabling:** Skills exist across research institutions, charities, businesses. Grant scheme - Facility for Investment Ready Nature in Scotland (FIRNS) – shifting opportunity towards investment readiness and mature markets

Scotland's Marine Natural Capital approach: The Story So Far

Claire Speedie, Senior Policy Officer Blue Economy, Marine Scotland, Scottish Government

Blue Economy Approach

An internationally recognised emerging model. Progress has been made globally, with institutions developing their own approaches in a regional context. All aim to achieve triple bottom line – that environmental, social and economic objectives are progressed and balanced with a wellbeing economy emphasis – supporting sustainability, prosperity, innovation, resilience, wellbeing and inclusion.

“Collaboration is vital to unlock the potential of Scotland's seas and tackle climate and nature crises.”

Scotland's Blue Economy Vision for 2045 (published March 2022)

A framework to bring considering natural capital into the marine space. By 2045 Scotland's shared stewardship of our marine environment supports ecosystem health, improved livelihoods, economic prosperity, social inclusion and wellbeing.

6 outcomes accompany the Vision - specific natural capital outcome, but runs through each:

- Marine ecosystems are healthy and functioning
- Scotland's blue economy is resilient to climate change
- Marine sectors are innovative and internationally competitive
- Blue Foods are sustainably harvested and farmed
- Scotland is an ocean literate nation
- Thriving communities have more equal access to benefits of our ocean resources

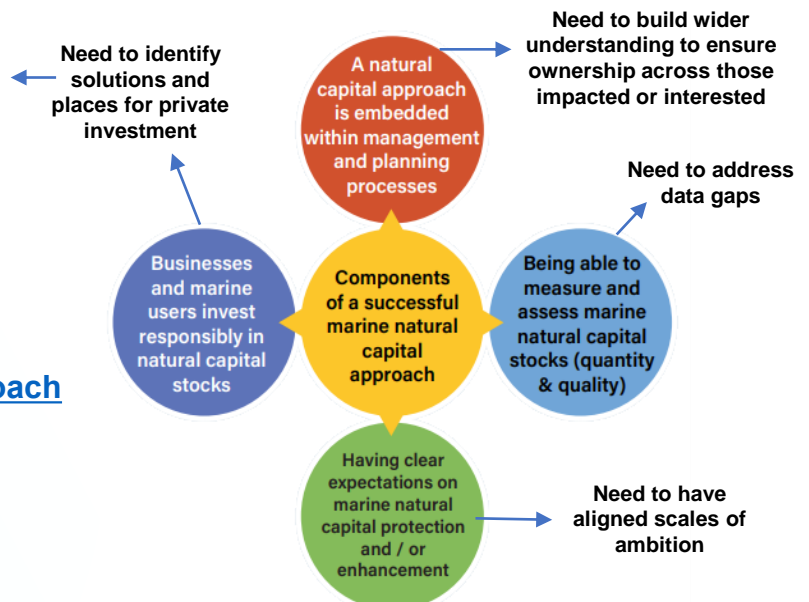
The Vision for Scotland

Provides an overarching framework for supporting management of coastal, marine and freshwater resources, achieving shared stewardship by 2045. Commitment to increase Scotland's natural capital and tracking status as a measure of economic success beyond GDP. Nature stocks need to be maintained to secure ongoing benefits for society.

Components for successful management of Scotland's natural capital (and challenges)

Scottish Marine Environmental Enhancement Fund (SMEEF) launched, with Crown Estate Scotland and NatureScot

CivTech Challenge 8.4 launched;
How can technology help us better assess and identify projects and opportunities that will improve and increase investment in Scotland's marine natural capital?



Next steps

Delivering Scotland's Blue Economy Approach

(published Autumn 2022)

We have committed to mainstreaming a Blue Economy approach, embedding into thinking to become integral to policy development.

7 elements identified:

1. Develop mechanisms, guides and tools
2. Diversify voices
3. Establish pilot projects
4. Communicate research
5. Map finance opportunities
6. Develop an evaluation framework
7. Ensure governance and a strategic narrative

Using a tool to apply a blue economy lens, we're working with multiple policy teams across Scottish government and testing externally with sectors and delivery partners.



Elsewhere in the UK and Beyond

Vicky Morgan, Leader, Marine Natural Capital at JNCC

The **Sustainable Blue Economies** workshop in November 2022 highlighted DEFRA work happening in England and the need for a whole-system approach, including social and governance systems, and to look at business as usual to make the business case for change, fully accounting for the economic risk associated with no action.

Read the report [Exploring an integrated approach towards a sustainable blue economy](#) | [JNCC Resource Hub](#)
or bit.ly/JNCCBlueEcon

The Evidence

Marine Natural Capital and Ecosystem Assessment Programme (mNCEA) has secured £37.5m over 3 years. Years 1-2 looking at:

- Innovative improvement of data collection and analysis
- Monitoring
- Storage, curation, accessibility and reuse of data
- Turning data into evidence tools and advice

“Indicators and scorecards from the JNCC project on good environmental status of our seas show little improvement despite investment.”

Good Environmental Status (GES) assessments

Indicators and scorecards from the JNCC project on good environmental status of our seas show little improvement despite investment. Natural capital assets, Benthic and Seafloor habitats indicators show fish ecology and biology informs regional seas data across the North Atlantic. Benthic indicators use 8 information streams, including population and pressure.

The pilot study led to funding for a new project in April, further developing the **Universal Asset Service Matrix**, in collaboration with Natural England - ‘*What are the impacts of GES on the economy, society and nature?*’, examining how to shift to good environmental status, what the costs are and who will be impacted.



Land-sea interface and the near shore – looking at the whole system. Environment Agency mapping and modelling, benefits of restoration, CEFAS remote sensing on sediment and nutrient plumes in estuaries.

Placed-based decision making – Natural England looking at where natural capital is already being used, for better integration in collecting information and exploring natural capital accounting, modelling and impact assessments for fisheries.

Quantification of values and trade-offs – income from sandeel fisheries, (livestock feed) is much less than the costs to society has led to policy change.

CEFAS mapping provision of seabed carbon sequestration – difficult to assess balance of sequestration and emissions under different pressure.

JNCC project looking at **ecosystem services and pressures in Marine Plan Areas** has evolved into Marine Management Organisation (MMO) project decision making.

Subscribe to the mailing list:

<http://eepurl.com/gYUV59>

marineNCEA@defra.gov.uk

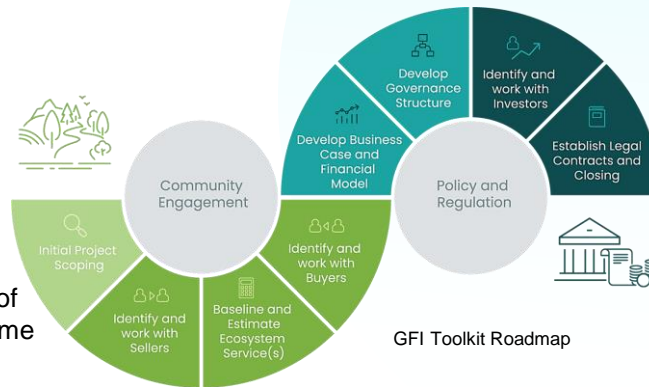
Insights from Land

Kerry Waylen, Research Lead in Environmental Governance at James Hutton Institute

The finance gap is well recognised – some environmental groups are seeking new partners for investment and seeing many actors wanting to move into this space, including the private sector. Action from financiers' conferences, Riverwoods etc. gathers evidence to unlock new investment and actors. It is not always about generating new profits - Landscape Enterprise Networks (LENs) are an example of businesses motivated by looking at own supply chain risks e.g. Nestlé working with dairy farmers. Need for change goes beyond tackling a finance gap - also happening because environmental management needs to become more holistic inclusive and transformative.

Data sets, tools and consultancy advice are available, ranging from GFI Toolkit roadmap for identifying and guiding new transactions, through to Enabling a Natural Capital Approach (ENCA) tools for policy-makers.

Many tools and apps are available from consultancies that claim to quantify aspects of natural capital (especially carbon) though some caution may be needed.



Change is needed
Holistic thinking is a strength of marine management, need to build on this and share lessons with terrestrial systems.

Regional Land Use Partnerships (RLUPs) use a natural capital approach and may offer lessons to share with Marine Planning process.

“We can build on the data we have, but not be constrained by it”

New transactions are possible

Codes and voluntary standards provide reassurance to buyers. More guidance on writing codes may be available soon. Private and public money *can* be blended via floor price guarantees - but many questions and challenges remain.

Build confidence with long term visions and frameworks, and pilots help to learn as we go. Establish minimum rules and standards e.g. Investment Ready Nature Scotland (IRNS) Grant Scheme has built in evaluation. Existing work by BSI on Biodiversity Net Gain (BNG) and new work to establish standards for environmental markets will help to set minimum standards.

Challenges – how can we enable new transactions at scale?

- Scale mis-match for large investors and small land managers
- Stacking multiple investments into one ecosystem with interlinked services including carbon
- Monitoring is costly but essential
- Proliferation of markets and standards
- Building trust and confidence and experiment as we go, but there may be fundamental limits to what we can sensibly deliver via new transactions - need to work out key ecosystem services to focus on
- Ensure we avoid unintended consequences such as ‘green-washing’, over-simple/single issue management (carbon) and community exclusion

Need to think strategically. thinking long term and across multiple capitals. Good example may be One Planet Choices - developed by SEPA for Scottish Water and tested in other venues.

We can build on the data we have, but not be constrained by it. To help us with this we can build on systems science, also sciences on decision-making and risk management. What counts as ‘good enough’ data will vary according to the business and decision.

Brokerage and facilitation is key, building on existing rationales and motivations e.g. supply chain risk reduction, insurability etc. Linking with international discourse and standards for consistency, and Scotland has an opportunity to shape these.

“Scotland has an opportunity to shape international discourse and standards for consistency”

Insights for marine

- No mosaic of land managers with individual concerns and motivations
- No communities of place to build into new transactions, but coastal communities have relationships that may help to unlock new initiatives
- Carbon is less dominating, but difficult to define and control leakage of marine carbon
- Focus efforts and avoid silos e.g. sectoral, marine-terrestrial
- Keep academics involved for opportunities to align on learning and reflecting
- Use existing networks

Introduction

Dr Hannah Rudman, Co-director, Thriving Natural Capital Challenge Centre Scotland's Rural College (SRUC)

What're the essential elements necessary to create high-integrity voluntary ecosystem markets?

We need:

1. Businesses and community groups to develop projects using high integrity, agreed standards and codes, and for these to be upskilled by the networks we have available, such as the [Marine Natural Capital Network](#) and [Scottish Nature Finance Pioneers](#)
2. Private sector nature users e.g. companies, to buy credits for ecosystem services, where they may have used them for free before
3. Investors that have ESG reputational needs and/or ethical and sustainable funds to direct the money in good ways
4. Government agencies, regulators and verifiers to ensure we have measurably better outcomes for the marine natural economy



Industry with Ambition: Case studies

The Glenmorangie Company

Hamish Torrie, Director of Corporate Social Responsibility

The DEEP project (Dornoch Environmental Enhancement Project)

A small Marine Protected Area (MPA) stemmed from the desire to mitigate impacts. Glenmorangie currently emits 220m² wastewater daily. In 2017 we invested in anaerobic digestion system to clean up 95%+ of chemical oxygen demand, in a partnership with Herriot-Watt University (HWU) and Marine Conservation Society (MCS), to return the native European Oyster to the seabed.

Developed into an exemplar project focusing on water quality, marine biodiversity and exploring the carbon storage potential of oysters with the ambition to breed 4 million oysters on a 40-hectare reef over 5 years. DEEP Partnership (which started in 2014) was highlighted at COP26 alongside the Blue Carbon Forum (BCF) and is supported by University of St Andrews, Marine Scotland, NatureScot. A complicated supply chain including hatcheries in Orkney and Lancashire and spat growers on the west coast. Biosecurity is a must, oysters are scrubbed by a team at Herriot-Watt. 60k oysters now in the Firth, but need funding to reach 4 million.

An initiative that prioritises enhancement of water quality, marine biodiversity and carbon storage. Seeking out the remaining wild oyster population sites in Scotland to populate the hatchery, then transferring to the restoration site, increases variability and resilience of oysters and enables long-term survival.

"The project's profile has highlighted to other companies in the LVMH Group the progress that can be made with this partnership approach".

Does a distillery bridge land and sea?

Glenmorangie was established on the Dornoch Firth in 1843 and we would like to sustain our environment to exist for 100 years.



"The project benefits the local communities and businesses involved in the Highlands and Islands - creating a new, major-scale industry in the area".

Partnerships with growers moves projects from concept to delivery at scale. Small growers need the restoration market to help them sustain their businesses.

There are around 30 native oyster restoration projects across Europe. Proof of concept is achieved, the science has been proven, MCS project officer is now setting up community outreach. Environmental change was the initial driver for the initiative, but community is very important - trying to sustain independent growers who serve the restoration market and the plate market.



Scottish Water

Mark Williams, Head of Sustainability and Climate Change

Working with natural capital to support service outcomes

Thinking about carbon, natural capital and biodiversity in the context of service outcomes and decisions. Working with the environment across the scale of the asset base, from treatments works and pipelines to households and owned land.

Three strategic challenges:

1. Sustaining services
2. Delivering on net zero ambition - www.scottishwaternetzero.co.uk
3. Satisfying public bodies' duty around biodiversity, contributing towards Scotland's goals

Costs vs traditional solutions – ensuring we are looking in-the-round, as part of Scotland needs, and implications for the rural economy, and agricultural tenants.

- Baseline of all landholdings completed 2022 with Natural Capital Research
- Land inventory underway with James Hutton Institute highlights areas and holdings to prioritise
- Carbon Inventory Tool in development
- Pilot schemes for habitat benefits e.g. 30 hectares of natural woodland opportunity in Fife, converting grassland, identifying the biodiversity and carbon benefits



Scottish Water
Always serving Scotland

Making choices for nature with an economic rationale

e.g. investment case for land management change at Loch Katrine; carbon capture per annum, km of new access pathways for recreation, future resilience of water quality etc., and analysing the benefits and impacts of improving peatland or grassland, catchment management, pesticides governance or changes to blue-green urban infrastructure.

Incorporating standard solutions for natural capital assets embedding unit costs in design manuals for engineers to plan.

Understanding natural capital stocks - quality and quantity of water, and the occupation of land and woodland owned for captured carbon.

Assessing resilience at landscape scale, the carbon captured/lost per annum and demonstrating benefits to customers to justify investment for Scotland.

Collaborating for the Blue Economy

Samir Whitaker, Biodiversity Lead Specialist, Ørsted

Partnerships and collaborations – make ecological sense to reach biodiversity restoration and resilient habitats at scale providing less fragmented sites, connectivity and also economic sense, enabling blended finance, bigger partnerships capacity to de-risk bigger projects, and attract finance at lower cost.

About Ørsted

Renewable energy offshore developer
- 2000 turbines in the water. Biodiversity ambition to deliver net positive impact in all commissions from 2030. Looking at metrics, partners, measures of success aggregated across the company and aligning with other developers and investors.

Project based approach to climate change mitigation hierarchy, understanding the biodiversity context, avoiding disturbance to biodiversity e.g. routing cables away from habits, applying mitigation impacts, restoring biodiversity or options for compensation. Looking at habitats and species in net gain.

“Collaborations make economic sense, enabling blended finance, with bigger partnerships capacity to de-risk bigger projects, and attract finance at lower cost.”



Collaborating for the Blue Economy

Samir Whitaker, Biodiversity Lead Specialist, Ørsted

...continued

Stromar project - in partnership with Bluefloat, Ronantis and Crown Estate Scotland (CES) - gigawatt-scale floating wind site in Scotland.

Seascope scale project on Humber estuary - a succession project restoring native oysters, seagrass, saltmarsh, revegetation of coastal sand dunes. Working with local wildlife trusts, who have connection to landscape/seascope.

Holderness Fishing Industry Group (HFIG) – science based partnership gathering evidence on impact and benefits of wind farms.



Anholt 3D Reef Structures - partnership with WWF Denmark, pilot-testing offshore windfarm reefs to provide habitat for cod to spawn.

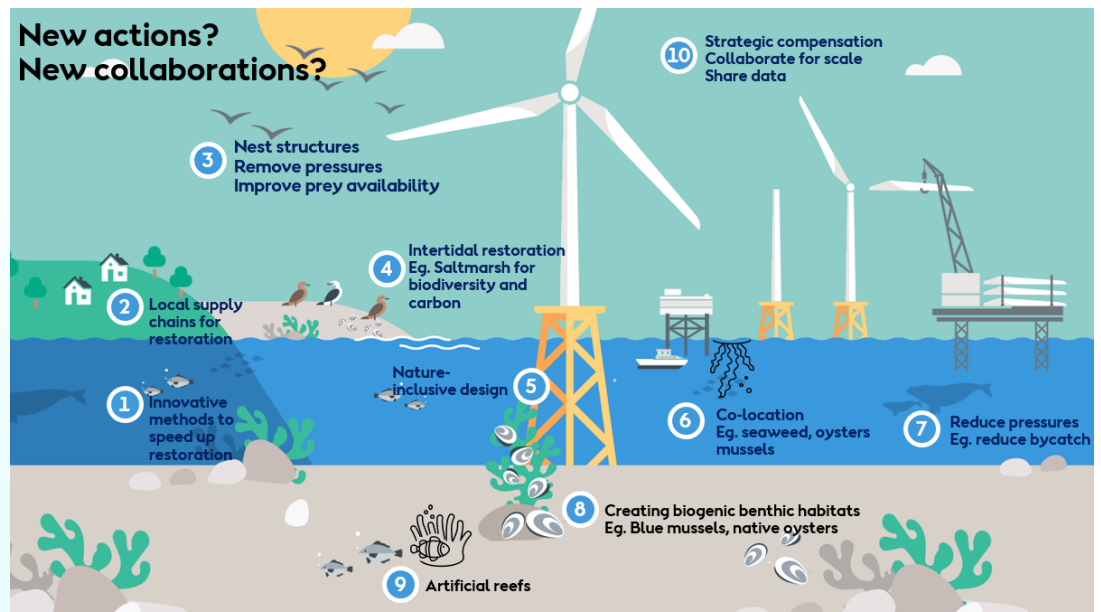


Seaweed farming offshore - potential from a carbon and biodiversity perspective, looking at evidence base in partnership with SeaGrown in Scarborough. Aiming to develop a standard methodology to assess biodiversity uplift at offshore seaweed farms, with a range of technologies assessed including eDNA, ROV, drop-down cameras, and direct observations for biodiversity. Phase 2 will consider applying the methodology to a commercial-scale seaweed farm to track change over time.

“We need innovative methods to scale up restoration, to make it lower cost to do much more with the resources we have”

We're working with other sectors to reduce by-catch pressures, biogenic habitat enhancement, artificial reefs – collaborating across the seascope to understand what's there, common approach to data collection and monitoring and compensation measuring.

We need innovative methods to scale up restoration, to make it lower cost to do much more with the resources we have, promoting restoration technologies and big business opportunities for local supply chains, compensation restoration and nature-inclusive design e.g. [Dutch Offshore Wind Innovation Guide](#).



The Future of Fishing: Natural Capital and the UK Fishing Industry

Hannah Fennell, Head of Orkney Fisheries Association,
Vice President of Scottish Fishermen's Federation

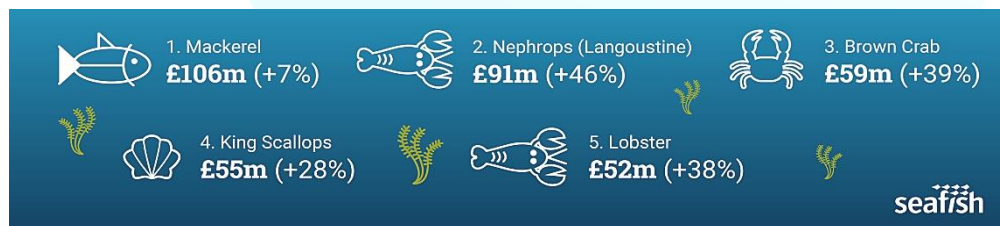
Fisheries management natural capital and ecosystem services

Direct - economic value of fish and shellfish

Indirect - ecosystem and abiotic services environmental status essential for a healthy fishing industry

Connectivity of interactions – acknowledges importance of tangible and intangible natural capital assets and resilient ecosystems and seafood industry. Sustainable and well managed fishing supports all 6 outcomes of the Blue Economy Vision.

Economics of fishing – huge value of seafood landed in rural coastal and island communities, supports the processing industry and investment into alternative fuels. Supports 7k FTE jobs e.g. reliance on highly skilled engineers to enable fishing selectively, sustainably and safely.



Value of landings into the UK (2021)

Environmental outcomes – extensive long term data sets include seabed habitats, currents, species migration with high levels of ocean literacy. The ambition is to incorporate this knowledge into the wider decision-making process.

“The Scottish fishing fleet is the largest part of the industry in terms of economic value for the UK”

How does Natural Capital and the Blue Economy Vision support fishing?

Blue clusters – Seeing advances in technology and improvement of pier side infrastructure which will benefit coastal industries



Trailing SafetyNet Technologies devices in Orkney – collects environmental data from pots e.g. light, temperature, movement etc. to create an environmental baseline to use for fisheries management and feed into projects, local marine plans and natural capital assessments.

Data collection and sharing – Allows us to incorporate ecological knowledge into how we manage the environment and assess stock

Ecosystem approach to management - Flexibility in management to facilitate the just transition and helping fishing to be recognised as a modern, thriving Scottish industry, contributing to national goals.

Enabling Actions

Dr Lucy Greenhill, Head of Blue Economy Policy and Practice at Howell Marine Consulting



Blue Economy pathways

HMC are at the forefront of the transition to a sustainable blue future, delivering high-profile projects nationally and globally on marine policy and management solutions and institutional change across all areas of the Blue Economy.

Internationally, this has included development of integrated ocean policies for five Eastern Caribbean nations and Blue Economy roadmaps for Pakistan and Indonesia, and we are working intensively to support challenging delivery of UK policy, including Net Zero alongside Marine Net Gain.

UNEP Sustainable Blue Economy Transition Framework

HMC are supporting development of the UNEP's Transition Framework, as a guide for countries in understanding the transition, to enable understanding of dynamic governance systems and define the practical action needed to embed sustainability into decision making.

The Framework is underpinned by 5 principles and defines 3 phases to understand the process of change:

1. **Understanding the system** - gathering baseline data to understand the current state including interrelationships, working with stakeholders to develop their understanding their integrated system and steer behaviour change.
2. **Enhancing the system** – developing a shared direction of travel towards a Blue Economy vision, articulated in an integrated policy framework and actions to take the vision forward.
3. **Delivering change** - longer term implementation of integrated policy framework through integrated marine management including marine spatial planning, with monitoring and evaluation process to feedback into the system.

“Not all leadership comes from government but different actors within governance systems working together”

Natural Capital and the Blue Economy Transition

Things are changing with high level policy commitments and activity growing in this area e.g. Defra's Marine Natural Capital Ecosystem Assessment (MNCEA). Natural capital approaches weave throughout the transition to a Blue Economy, including:

Understanding the system by measuring and using asset registers for the baseline, monitoring change and improving the quality of natural capital and evaluating effectiveness of policy.

Natural capital-informed policy can help understanding the operating space and thresholds to articulate trade-offs from policy interventions, as well as inform marine planning and licensing and decision making.

Participatory mapping and evaluation can help to involve stakeholders in the planning process.

Making stronger links with sustainable finance by connecting ecosystem services evaluation and accounting can generate revenue to support marine management.

Transparency and good governance can be supported by using natural capital approaches and evidence to support decision making.

Looking ahead, HMC are engaged in the development of new approaches to consider multiple capitals in decision making, such as infrastructure, financial stocks and flows of services, cultural importance and wellbeing, etc.

Cross-cutting enablers of the transition include:

- Stakeholder engagement and coalitions for change - not all leadership comes from government but different actors within governance systems working together
- Strong political leadership to steer approach
- Sound science including ecosystem services valuation and natural capital accounting
- Sustainable finance mechanisms
- Good governance including transparency and accountability

Scotland's Blue Economy: Current Status

Amy McQueen, Senior Economist and Head of Marine Analytical Unit

Peter van der Meulen, Economic Adviser - Marine Analytical Unit

Marine Scotland, Scottish Government

Blue Economy Vision Outcomes

The recently published [Scotland's Blue Economy: Review of Current Status](#) document describes our starting position in the transition to adopting a Blue Economy approach to marine sectors, communities, and the environment. It provides us with the foundation to consider how we can track our progress and determine if significant and lasting change is occurring.

Some key points from this publication include:

Climate change – the most critical factor affecting the marine environment i.e. sea level rise, temperature increases, ocean acidification. Emissions data is lacking in blue economy sectors but offshore wind has had a positive impact on carbon footprint and there is a reduction in emissions from vessels.

“Fish stock sustainability has improved in Scotland's fisheries over the last decade.”

It's a complex system – we're identifying specific actions in context and will continue to monitor. Natural capital accounts ideally will enable understanding of impacts, for now information is available across environmental, economic and social pillars.

Human activity is also putting pressure on marine environment from fishing and provision of seafood

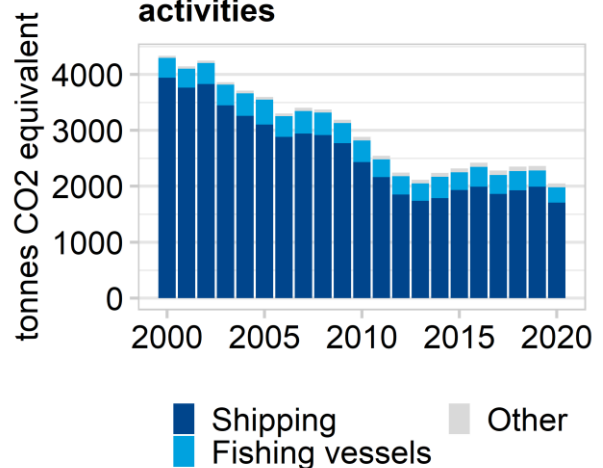
Economy and trade – blue economy contribution to Scotland's overall economy has decreased, largely due to reductions in oil and gas sector. Seaport exports increased in the last decade.

Food security – Scotland large producer of seafood, fish stocks sustainability increased, other industries such as aquaculture are lacking data currently.

Social outcomes – work to be done to ensure inclusivity and equity, e.g. fishing is a male dominated sector, but access to the coast is considered a low cost activity and many in Scotland live near green or blue spaces.

Ocean literacy - residents have a good understanding of key terms (but understanding of natural capital less clear), oceans considered important and lifestyle changes reflect this.

Emissions from select marine activities



Source: Scottish Government, July 2022

“Scotland accounts for the majority of the UK's seafood production, and for 0.3% of global seafood production”



Measuring and Assessing

Hannah Rudman, Co-director Thriving Natural Capital Challenge Centre, Scotland's Rural College (SRUC)

Private sector finance drives up demand for quality measurement and assessment

Its required to verify the validity and trustability of natural capital projects – demanding increased levels and quality of data.

The finance sector is used to working with and receiving data quarterly e.g. from the tech sector, natural capital projects can do the same over time, measuring a baseline and points of improvement over 5 years, 10 years, using digital technologies for perceived trustability and validity.

SRUC research suggests different types of digital data can be decision-grade and can feed into digital reporting and verification mechanisms that codes and standards set, proving the science has taken place see <https://decisiongradeiot.com>.

Standards and assessments are in place in UK compliance and voluntary markets e.g. emissions trading scheme, biodiversity and marine net gain, nutrient neutrality etc.

“Research suggests different types of digital data can be decision-grade and can feed into digital reporting and verification mechanisms“

Compliance markets

UK Emissions Trading Scheme
Biodiversity Net Gain (England)
Nutrient neutrality (England)
Marine Net Gain (England, pending)

Voluntary markets

Biodiversity

Water quality

Carbon

Peatland

Woodland

Natural Flood Management

Agricultural soils

Ocean recovery

Agroforestry

Other agriculture

Carbon capture technologies

Blue carbon

Landscape Recovery

Voluntary markets

There are existing and emerging voluntary markets governed by codes and principles the finance sector recognises. A saltmarsh code is in development. We are striving for high integrity standards, and are proposing governance mechanisms for this - see <https://eartharxiv.org/repository/view/5247/>

“We are striving for high integrity standards, and are proposing governance mechanisms for this.”



SRUC is currently researching biodiversity measurements approaches for Scottish Government, working with interested parties and government agencies to ensure approaches in Scotland meet responsibility and high integrity principles – looking at Defra metric, international standards, and programmes from private companies to provide recommendations to guide next steps.

Embedding in Policy and Practice

Cathy Tilbrook, Head of Sustainable Coasts & Seas, NatureScot

NatureScot's mission to tackle the twin nature and climate crises is driven by understanding the value of healthy nature to all and that **prosperity and wellbeing are embedded within nature**. To deliver this we need to transform the way we plan and manage the use of our seas.



Natural capital can support better assessment and valuation of nature - to promote clearer decisions and underpin investment. As a lens it can help others see the intrinsic value of nature and go beyond nature language, describing quantity, condition and changes over time, to a broader range of audiences and brings in investment for nature restoration and management.

Technical use - to blend quantifiable evidence with qualitative values. This is very difficult in the marine environment, particularly gathering data, its expensive to do this regularly so we need proxies to account for changes.

High level policy setting requires quantifiable data - MPAs offer deeper approach, assessed more regularly to examine how marine habitats and species are interacting. Implications for trends to drive management and licence decisions.

Frameworks for considering natural capital

Build frameworks that allow additional information to be added as we improve blending quantifiable data and values with broader trends and intrinsic values.

Embedding through policy coherence – making sure Blue Economy Vision is aligned with messages and policy drivers in other policies and plans impacting on marine environment. An iterative approach to delivery.

“As a lens [natural capital] can help others see the intrinsic value of nature and go beyond nature language, describing quantity, condition and changes over time.”

National Marine Plan

A key delivery vehicle, publication of an updated version is planned for Summer 2025. this will be a more detailed, and a more prescriptive plan that takes trade-offs into account to balance and focus decision-making, to meet the Blue Economy Vision.

Pilots include:

- Embedding natural capital approaches to marine plan development
- Mapping ecosystem services of habitats
- Asset and risk registers
- Sandeel fisheries management
- Seafloor carbon trade-offs

Embedding in sector practice – aquaculture and other marine sectors rely and have an impact on ecosystem services. Shellfish impact water quality and provide a tradeable service upstream for land users through remediating water quality, and kelp and shellfish beds provide coastal protection. Source-to-sea linkages are being explored.

Investing Responsibly

Christine Rolin, Senior Project Manager Blue Economy, Highlands and Islands Enterprise

HIE aim to support regional economic development

by supporting businesses and communities. A natural capital approach is a new market opportunity to bring jobs into the region, can provide benefits for communities and mitigate climate change.

HIE funds 30-50% of projects, the remainder is provided by private investment and there's a diverse range of opportunities available.

Project assessments consider strategic, management and financial cases

along with benefits such as job creation, community or environmental benefits, and whether the project can be profitable and viable in the longer term.

Priorities include:

- aquaculture
- shellfish and seaweed as nature-based solutions
- marine and environmental services

Specialist knowledge industries are key to delivering these, ensuring they are founded on scientific principles.



“It’s key to retain natural capital value in a way that interacts with existing businesses and communities”

Reports are available on natural capital and community wealth building plus the [Blue Economy in the Highlands and Islands](#) report.

Stimulating Investment in Marine Nature

Sarah Brown, Scottish Marine Environmental Enhancement Fund (SMEEF) Manager

Scottish Marine Environmental Enhancement Fund (SMEEF) is designed to create a long-term sustainable grant fund to support meaningful restoration of Scottish coasts and seas by enabling businesses to contribute to marine restoration. The fund is hosted by NatureScot and they also sit on the Steering Group along with Marine Scotland Directorate and Crown Estate Scotland. [Seed funding](#) from the offshore renewable energy sector has enabled the fund to get established.

Ambition is to provide for the identified appetite for approximately £5-10m investment per year for marine restoration including baseline assessment and monitoring.

Projects must be impactful, value for money and connected with relevant experts and communities.

The last round of grants were for project development.

Grants covering:

- seagrass
- native oyster
- cetacean restoration and enhancement
- baseline surveys

SMEEF aims to be transparent and science based.

Businesses have no control over how the money is spent, but excellent feedback is provided.

[Current projects](#)

Contributions are welcome – only half the applications receive funding currently.



Participating organisations

AECOM
Baillie Gifford
Bakkafrost Scotland
Bean Tree
CivTech (Scottish Government)
Clyde Marine Planning Partnership
Commonwealth Secretariat
Crown Estate Scotland
Divirod
Environmental Standards Scotland
Fauna & Flora International
Ferry Hydro
Fife Coast and Countryside Trust
Finance Earth
Fisheries Innovation & Sustainability
Forth Estuary Forum
Heriot-Watt University/DEEP
Highland Adapts
Highlands and Islands Enterprise (HIE)
Howell Marine Consulting
Innogen Institute
James Hutton Institute
JNCC
Keep Scotland Beautiful
Mara Seaweed Ltd.
Marine Alliance for Science and Technology for
Scotland (MASTS)
Marine Scotland
Sustainable Management of Marine Resources
(SMMR)

NatureScot
Orsted
RSK
RYA Scotland
Salmon Scotland
Saltire Business Solutions Ltd
Scottish Association for Marine Science (SAMS)
Scottish Canals
Scottish Environment LINK
Scottish Environment Protection Agency
Scottish Fishermen's Federation
Scottish Forum on Natural Capital
Scottish Government
Scottish Wildlife Trust
Seafish
SEPA
Shetland UHI
SIFT
Sulmara
Tritonia Scientific
University of St Andrews
University of Stirling
University of the Highlands and Islands West
Highlands
VisitScotland
Where Now Consulting

With special thanks to our sponsors Howell Marine Consulting
and for in-kind support from the University of St Andrews

The Scottish Forum on Natural Capital brings together public, private and voluntary sector organisations to protect, value and rebuild Scotland's natural capital. We enable businesses and policymakers to better understand our dependence and impact on nature, and that protection and enhancement of Scotland's natural wealth is a viable option for organisations and businesses, providing economic opportunities and benefits for the whole of society. The Secretariat for the Scottish Forum on Natural Capital is provided by the [Scottish Wildlife Trust](#).



The University of St Andrews brings together researchers from around the globe to explore and collaborate across disciplines to make new discoveries, tackle complex societal and environmental challenges and find solutions to some of humanity's most pressing problems. The School of Geography and Sustainable Development integrates the study of the Earth's system with its landscapes, peoples, places and environments, developing the principles and practice to resolve planetary issues such as environmental change, biodiversity loss and global inequalities.



University of
St Andrews



St. Andrews Quad - Holger Uwe Schmitt CC BY-SA 4.0

[Back to contents](#)