SEA THE VALUE

MARINE BIODIVERSITY BENEFITS
FOR A SUSTAINABLE SOCIETY

WS1 – Natural Capital & Different ways of understanding value

Stephen Watson, Mark Collar Claudio Contento & Ian Dickie
(plus the StV Team)

5/6/2024

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Natural Environment Research Council

Economic and Social Research Council

SEA THE VALUE
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FOR A SUSTAINABLE SOCIETY

Our Vision

- Understand links between marine biodiversity, natural capital and ecosystem services, taking quantity (extent), quality (condition) and resilience into consideration

- Explore the economic and social values associated with biodiversity - and apply these values to natural capital accounting and engage real world communities in mapping social values and trade-offs

- Connect the ecological, economic and social values of biodiversity to decision-making through the co-design of green investment options to maintain and enhance biodiversity

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The Team

SEA THE VALUE

PML | Plymouth Marine Laboratory





Nicola Beaumont | Olivia Rendon | Stefanie Broszeit | Stephen Watson | Jenny Lockett | **New Post**

1495 UNIVERSITY OF ABERDEEN

Tavis Potts
Plus PDRA


Gordan Watson
Jo Preston
Plus PDRA

UNIVERSITY OF PORTSMOUTH

MORAY FIRTH COASTAL PARTNERSHIP

SOLENT FORUM Est. 1992

Coastal Partnerships Network

eftec economics for the environment



Ian Dickie
Rob Tinch
Mark Collar

DB Daryl Burdon Ltd. Marine Research, Teaching & Consultancy

Programme Steering Group. *Academic:* Prof Dasgupta, Prof Bateman (SWEEP), Prof Barbier, Prof Macreadie (Blue Carbon Lab), Prof Austin (Scottish Blue Carbon and Nat Cap Forum), Prof Paterson (SMMR), Burdon (CEH saltmarsh code); Prof Fletcher *Government and ALB:* Hinchen (Defra), Lannin (MMO), Morgan (JNCC), Armstrong (DAERA), Lindenbaum (NRW), Mellan (Environment Agency), Taylor (Natural England); NGO: Tudor (Blue Marine Foundation), Walmsley (WWF); Collin (Scottish Wildlife Trust, Marine Natural Capital Forum Scotland) *Industry and commerce:* Tinline (ABP), Rice (Southern Water), Goldie (Port of Cromty Firth).

Agenda

12.00 – 12.10 Welcome and WS 1 (Steve/Nicky)

12.10-12.35 Overview WS1 – Natural Capital & Different ways of understanding value (Slides)

·Introduce natural capital different ways of understanding value (Mark)

·A natural capital approach – in practice mapping introduction what we have done in the Sea the Value project (Steve)

12.35 - 12.45 Introduction to the NC exercise (Ian)

12.45 – 13.05 Working break while individuals create their maps/asset sheets (off camera)

13.05 – 13.45 Breakout groups to individual discuss maps and asset registers

13.45 – 14.00 Plenary wrap up (Ian/Steve)

Natural capital concepts

natural capital (NC)

the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people. (Source: Natural Capital Protocol)

natural capital assessment

the process of measuring and valuing natural capital impacts and/or dependencies, using appropriate methods to address a specific question or inform a decision. (Source: Capitals Coalition, 2021)

natural capital accounting (NCA)

efforts to use an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital. (Source: UN SEEA, n.d.)

…and why we use them

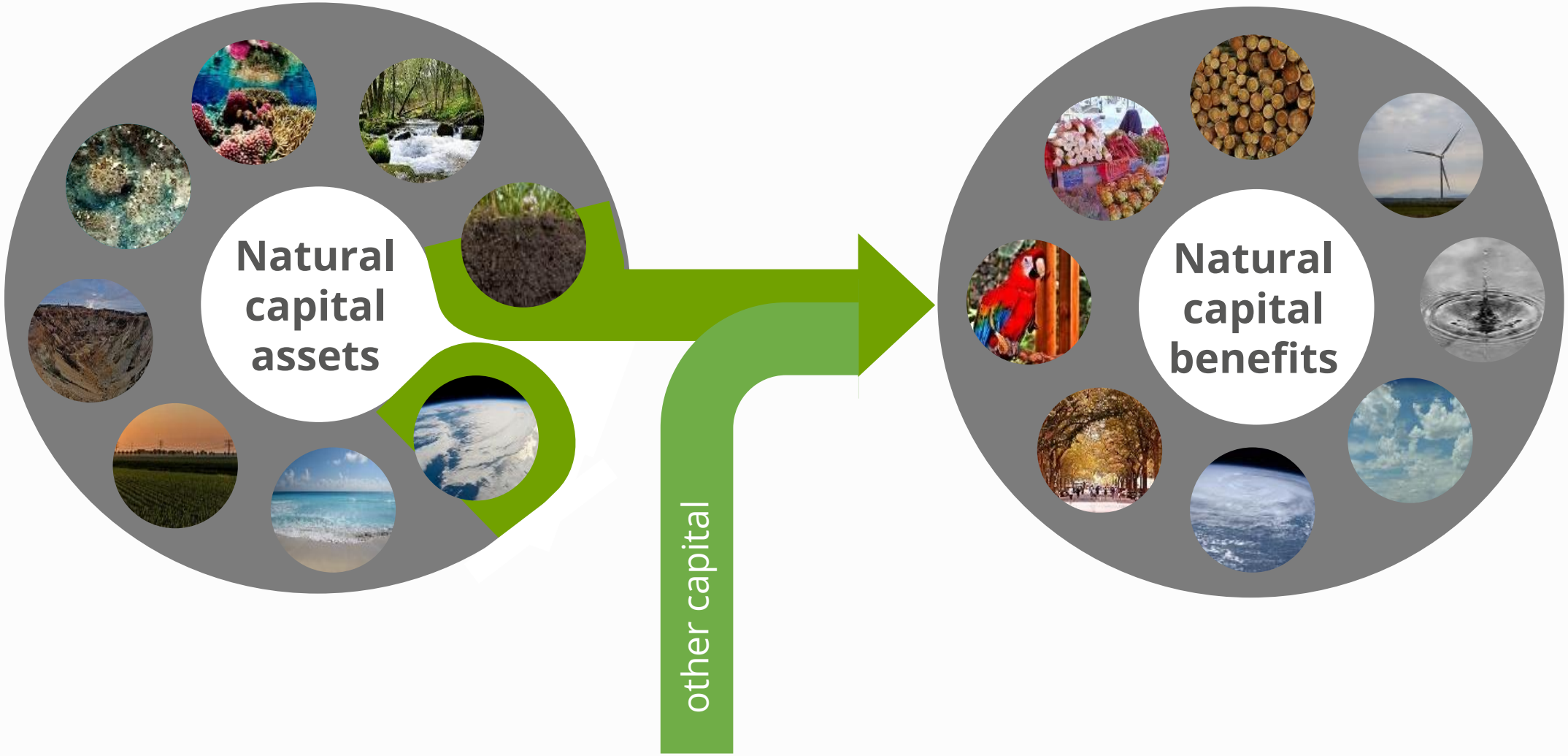
To better understand risks/opportunities and impacts/dependencies and depending on level of exposure to the natural environment

To measure (and value, where possible) the extent to which natural assets can provide benefits flows, i.e., ecosystem services:

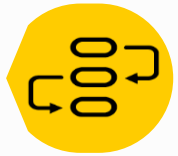
- Provisioning (e.g., food, fishing, water supply)
- Regulating (e.g., flood risk management, air quality regulation)
- Cultural (e.g., recreation, education, volunteering, physical health)

NCA as a tool for natural capital monitoring and evaluation

To assess alignment and progress towards achieving 'nature positive' and other organization-level commitments or targets (e.g., SDGs)


Natural capital assets
other capital
Natural capital benefits

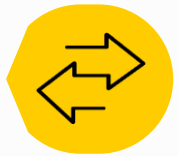
Features of natural capital approach



Focuses on stocks of natural capital assets (quality and quantity) as well as flows of benefits

Incorporates both biotic and abiotic natural resources

Assesses how both stocks and flows are likely to change in the future



Considers both dependencies of economic activity on natural capital and its impacts on natural capital

Uses valuation of impacts and dependencies

Makes the links between all of the above, to support systems-based thinking

A natural capital approach – In practice

1. Carbon sequestration and storage (CCS)
2. Bioremediation of waste

- Moray Firth
- Scale to National
- The Solent

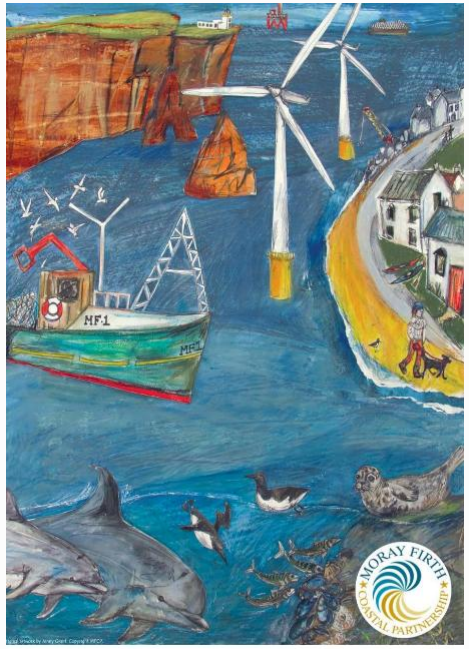
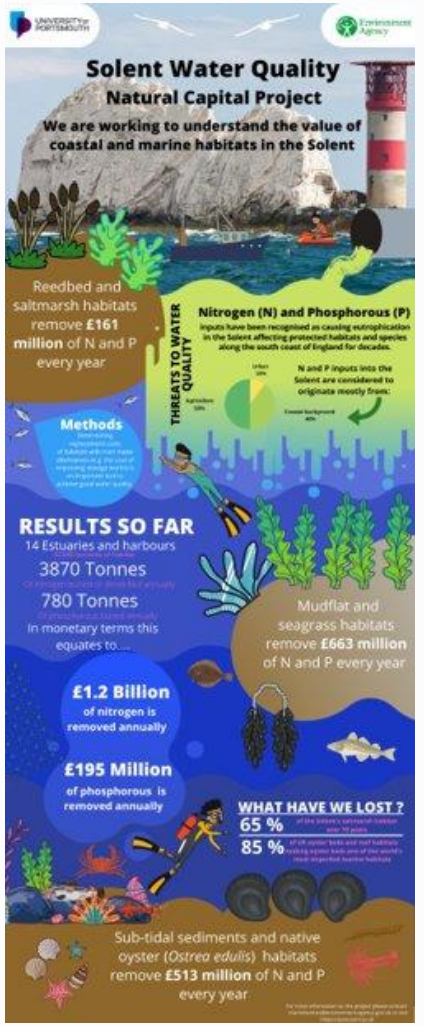


Image: Jenny Grant, copyright MFCP

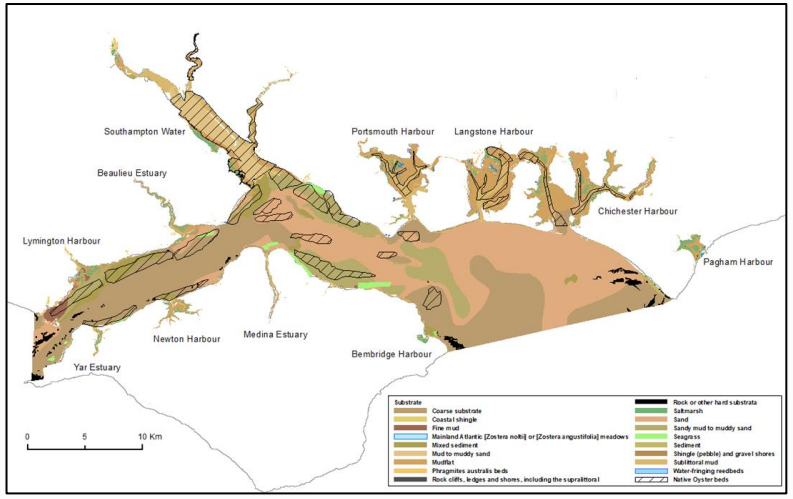


A natural capital approach – In practice

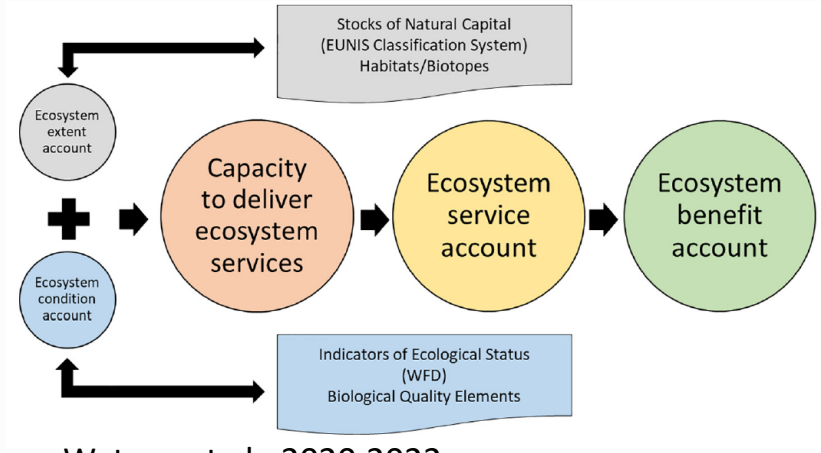
Natural Assets

Natural assets are the living and non-living elements of nature including species, habitats and oceans. (aka natural features)

The condition of the natural asset, its quantity, quality and location, affects the services and benefits it provides. We can use a variety of metrics (e.g. resilience) to help us better understand the condition of a natural capital asset.

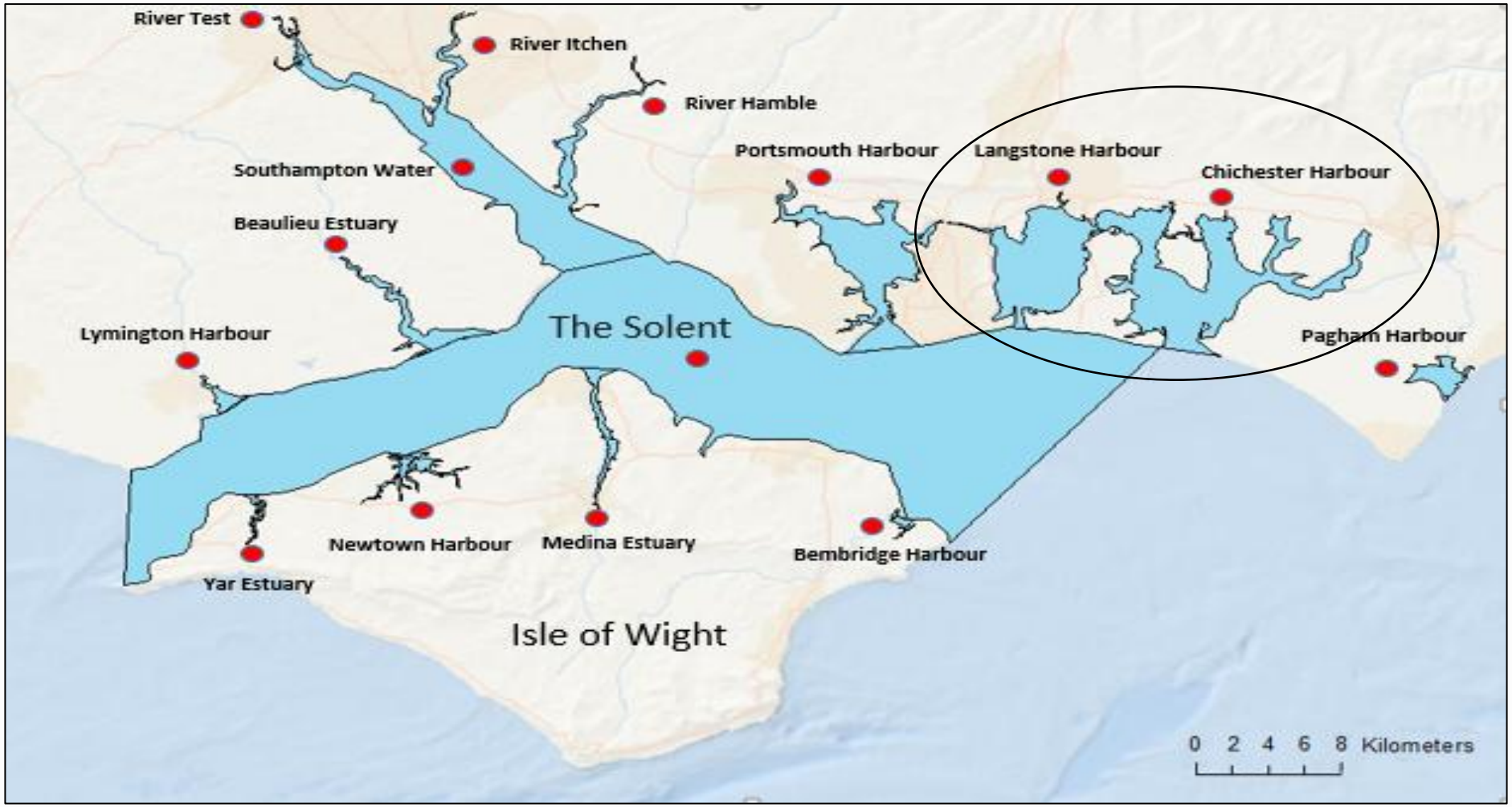


Natural Capital Asset Baseline Map



Watson et al., 2020;2022

Natural capital : Choose your boundaries!

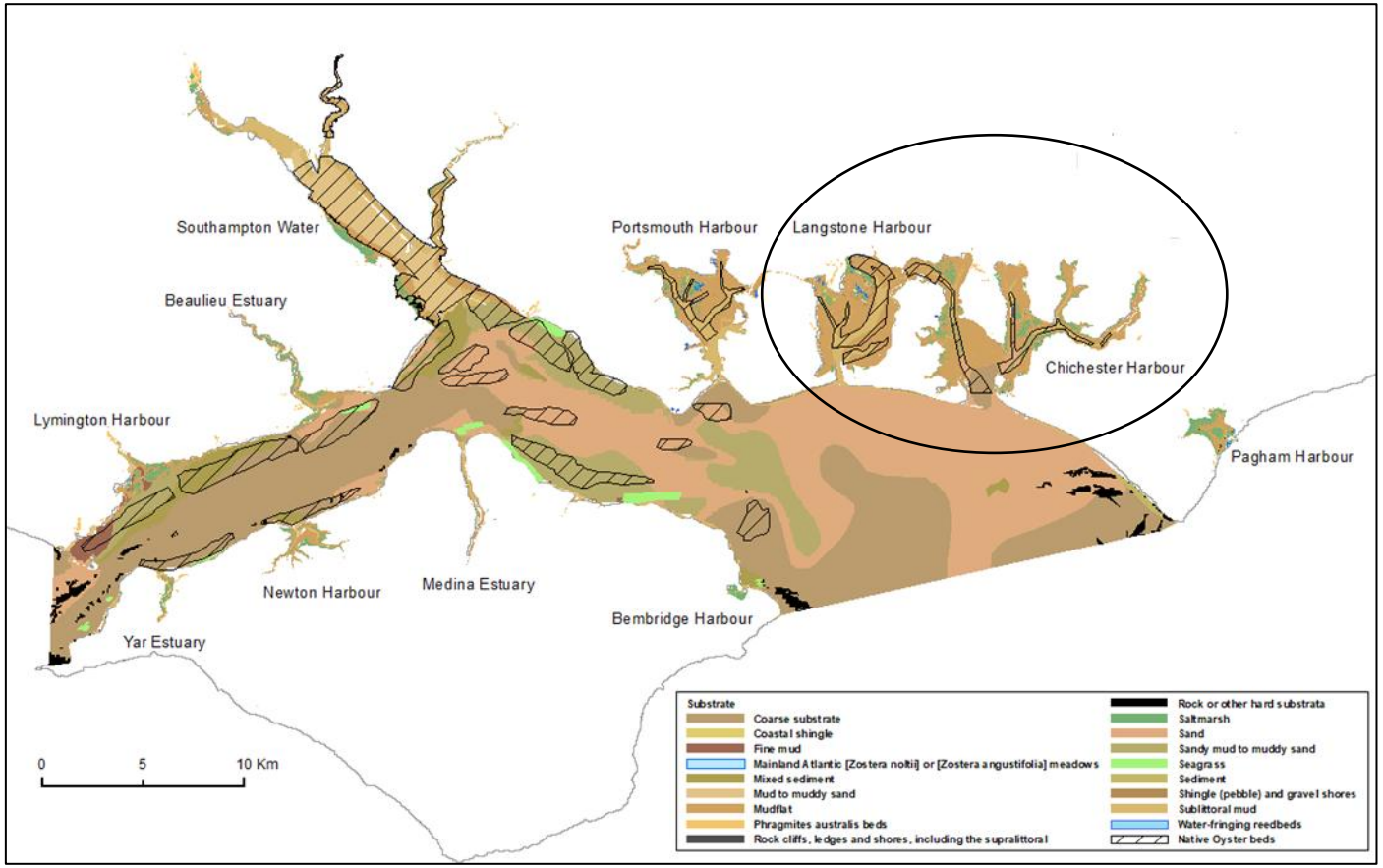


Data needs - Marine Habitat Data

Ecosystem Mapping

Natural Capital Asset Baseline Map

Mapped polygons and associated aerial imagery from last 5 years
Also of interest were mapped polygons from ground surveys and point data with ground cover classifications



EUNIS Biotopes

- **Reed beds (C3.2, C32.1)**
- **Saltmarsh (A2.5)**
- **Seagrass (A5.53, A5.545, A2.61)**
- **Littoral sediments (A2.3, A2.4)**
- **Littoral with macroalgal mats**
- **Subtidal sediments (A5.2, A5.3, A5,4)**
- **Native oyster beds (*Ostrea edulis*) (A5.435)**

EMODnet SEABED HABITATS

JNCC Joint Nature Conservation Committee

Southern IFCA Inshore Fisheries and Conservation Authority

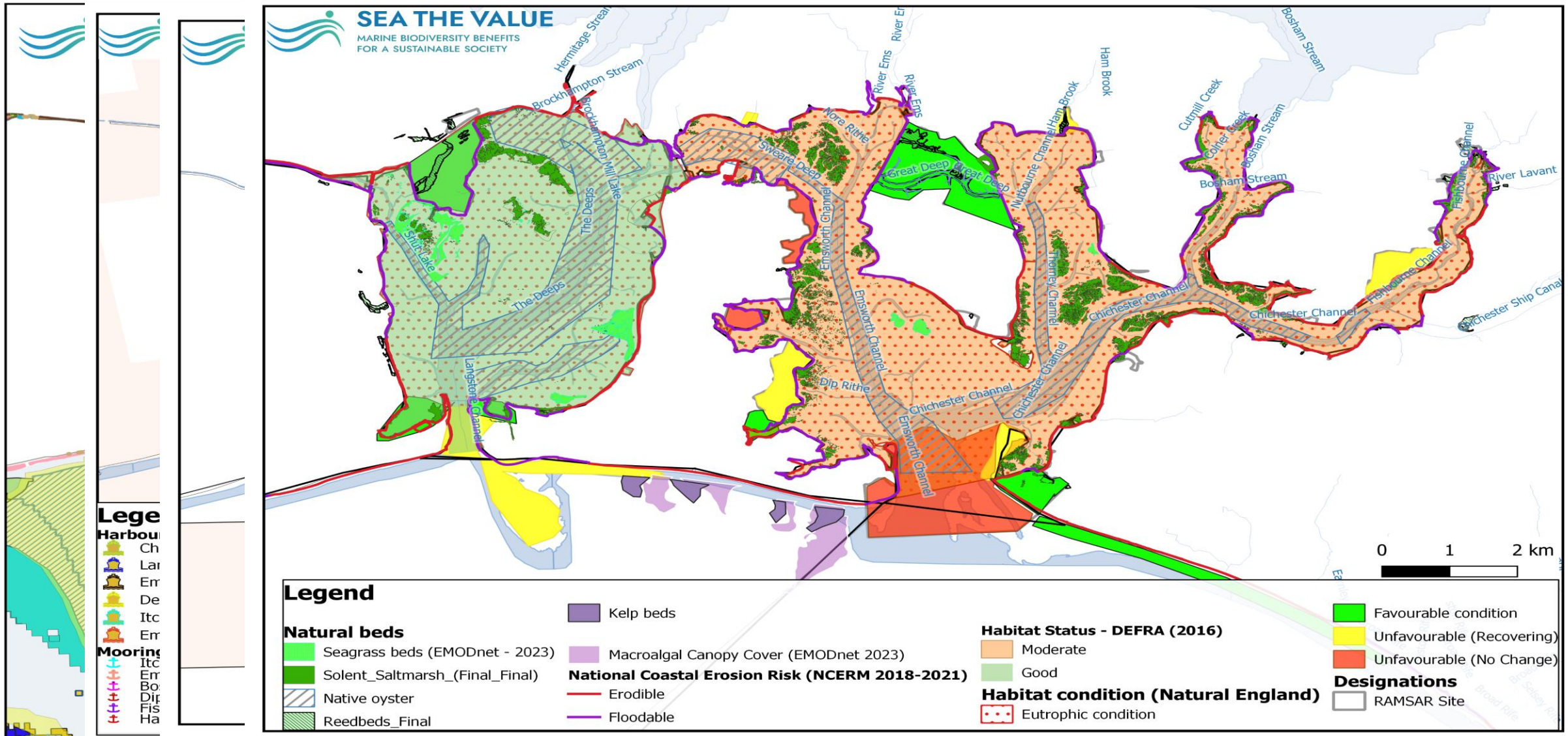
The Wildlife Trusts Hampshire & Isle of Wight Wildlife Trust

UNIVERSITY OF PORTSMOUTH

Channel Coastal Observatory

Environment Agency

Habitat and activity maps: Solent



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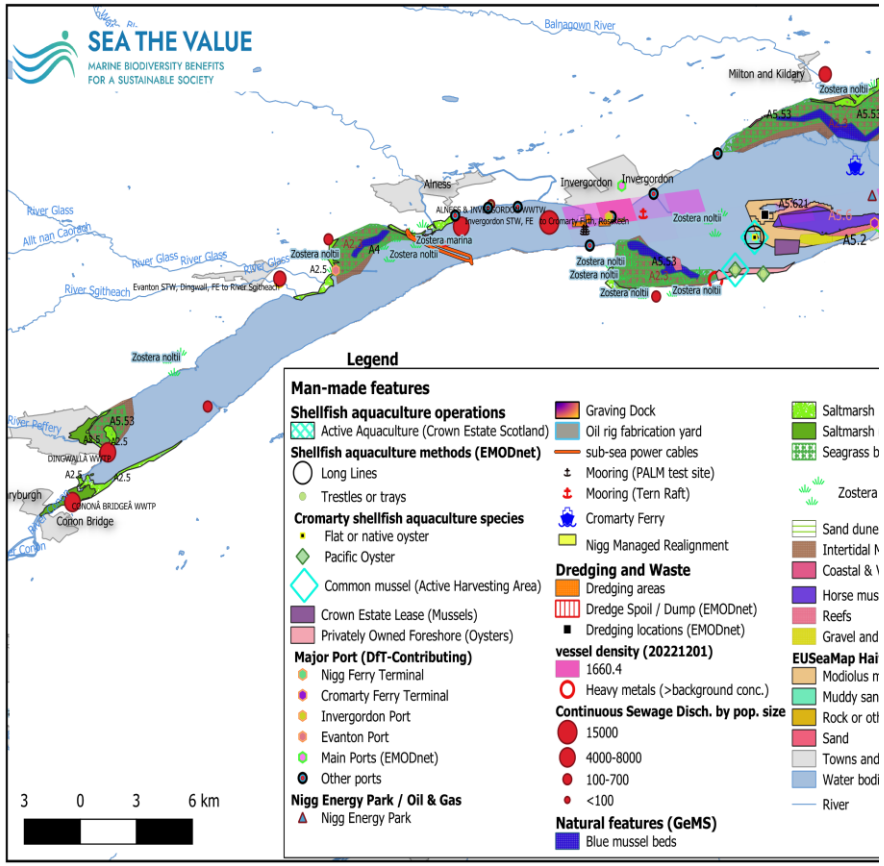
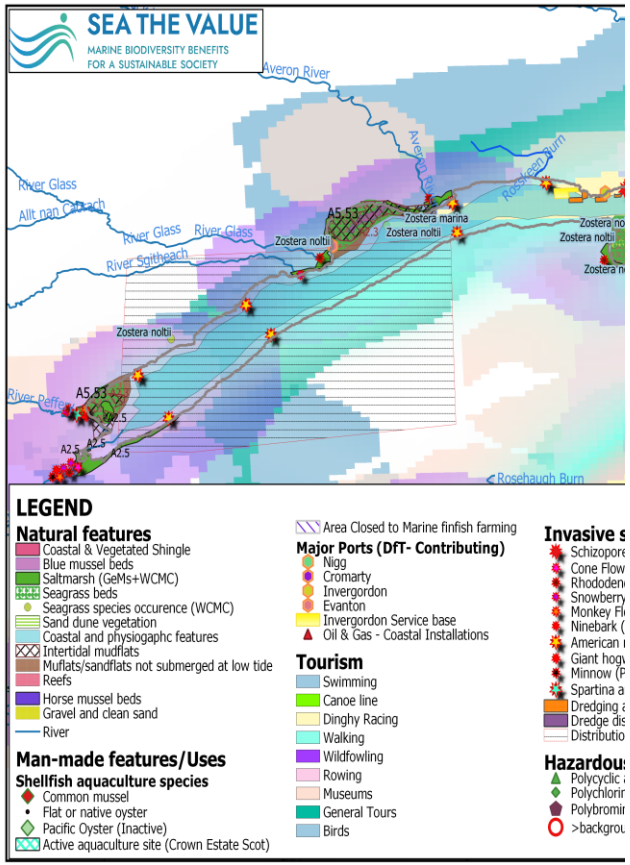
Habitat and activity maps – Cromarty Firth

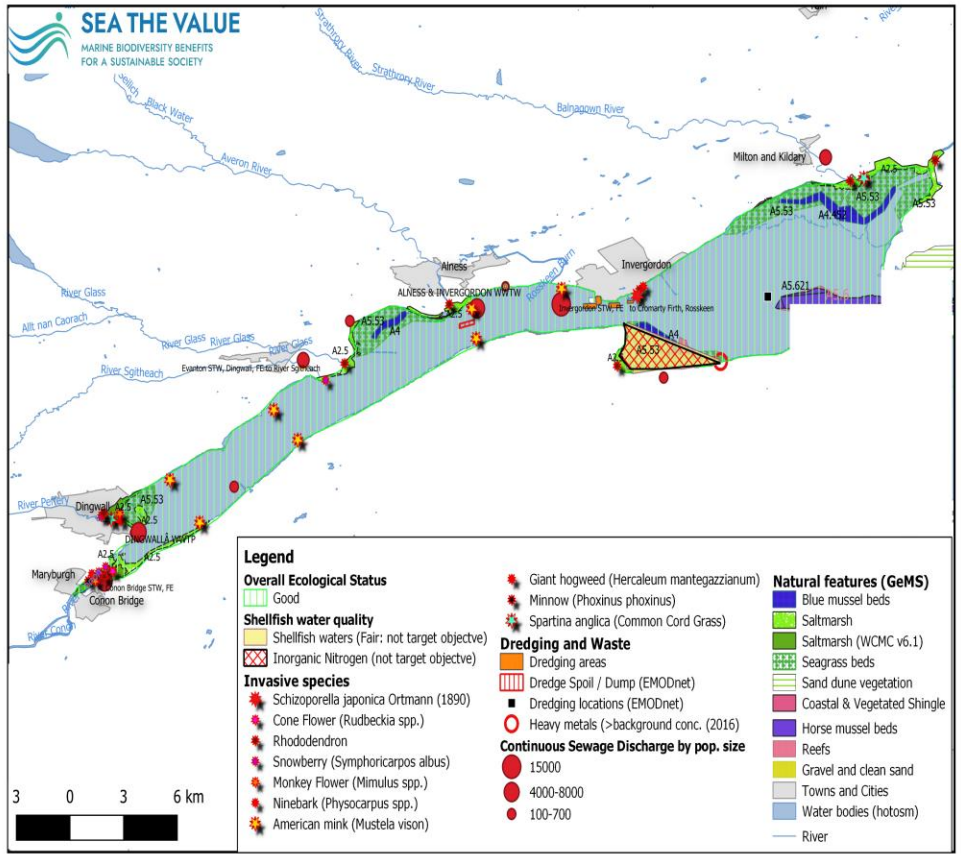
Existing shapefiles

Digitization from existing maps

Asset / activity maps



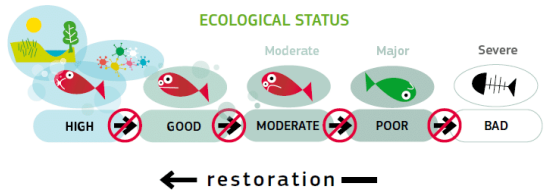




Asset register: habitat area and condition

Table 1
Relative assessment of ecological condition across the SEMS. Based on WFD ecological status data, Natural England condition assessment data and Beck et al. (2011) protocols. Ecological condition is assigned on a scale of 'High', 'Good', 'Moderate', 'Poor' or 'Bad'. *The Hamble Estuary is not a WFD waterbody, therefore the values used here reflect its status within the larger Southampton Water complex. (N/A) no data available (Unfavourable: Unknown Condition), (–) habitat not present. Native Oyster beds under WFD ('Class A', 'Long-term B', 'Class B', 'Class C' and 'Prohibited').

Assessment Unit (EUNIS Code)	Littoral sediments (A2.3, A2.4)	Littoral Sediments (With Macroalgae) (–)	Sublittoral Sediments) (A5.2, A5.3, A5.4)	Saltmarsh (A2.5)	Seagrass (A2.61, A5.53, A5.545)	Reedbed (C3.2, C32.1)	Native Oyster (*Ostrea edulis*) (A5.435)
Total Habitat Extent (ha)	6204	1616	19,486	1261	698	273	2839
Assessment Classification	WFD (2016)	WFD (2016)	WFD (2016)	WFD (2016)	WFD (2016)	NE (2018)	Beck et al. (2011)
Condition Indicator	Invertebrates	Macroalgal mats	Invertebrates	Angiosperms (Saltmarsh)	Angiosperms (Seagrass)	Angiosperms (Reedbed)	Native oysters
Lymington Estuary	High	Good	High	Moderate	(N/A)	Unfavourable - Recovering	–
Beaulieu Estuary	Good	Good	Good	Moderate	(N/A)	Favourable	(N/A)
Southampton Water	Good	Good	Good	Good	Good	Unfavourable - Recovering	(Prohibited) Bad
Hamble Estuary*	Good	Good	Good	Good	Good	Unfavourable - Recovering	(Prohibited) Bad
Portsmouth Harbour	High	Moderate	High	Moderate	Moderate	(N/A)	(Fail) Bad
Langstone Harbour	Good	Good	Good	Moderate	(N/A)	(N/A)	(Prohibited) Bad
Chichester Harbour	Moderate	Moderate	Moderate	Moderate	(N/A)	Unfavourable Recovering	(Prohibited) Bad
Pagham Harbour	Good	Good	Good	Moderate	Moderate	(N/A)	–
Yar Estuary	Moderate	Moderate	Moderate	Moderate	(N/A)	(N/A)	–
Newton Harbour	Good	Moderate	Good	Moderate	(N/A)	(N/A)	–
Medina Estuary	Moderate	Moderate	Moderate	Moderate	(N/A)	(N/A)	(N/A)
Bembridge Harbour	High	Moderate	High	Moderate	(N/A)	(N/A)	–
Solent Channel (Open Water)	Good	Good	Good	Moderate	Moderate	(N/A)	(Prohibited) Bad



"We need to really step up our action a lot in order to get close to the WFD goal. We may be some way from achieving it, but it can be done by working together at all levels."

Janez Potočnik, European Commissioner for the Environment

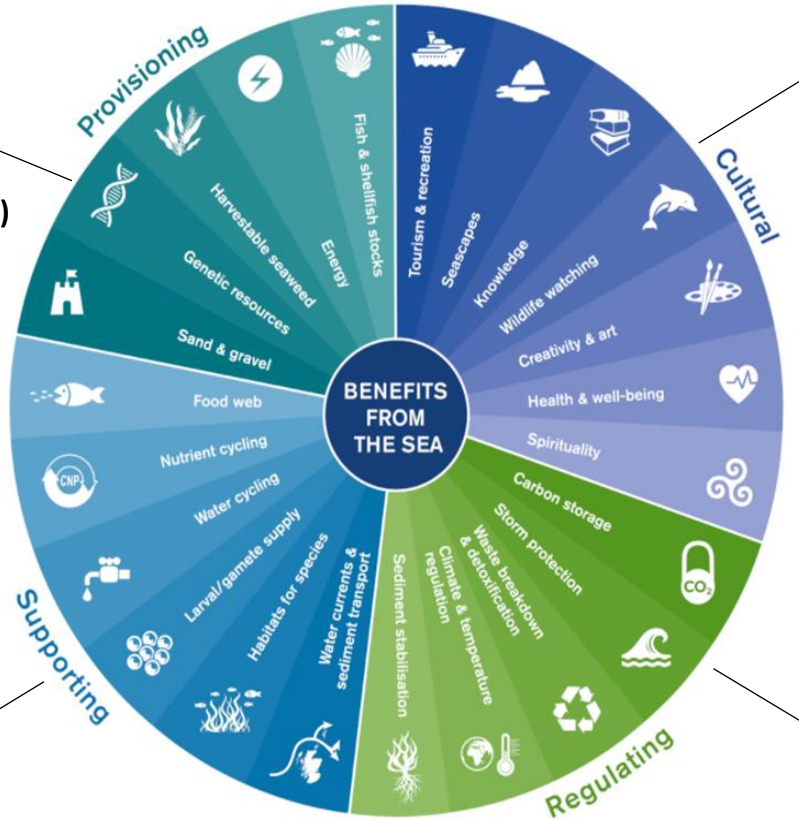
A natural capital approach – In practice

Ecosystem Services

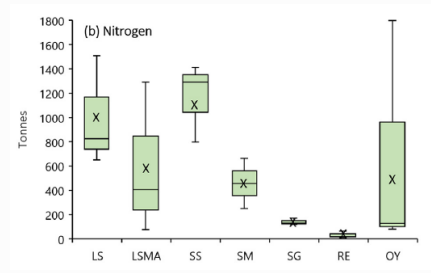
Ecosystem services are functions and products that flow from habitats and species which provide benefits to people.

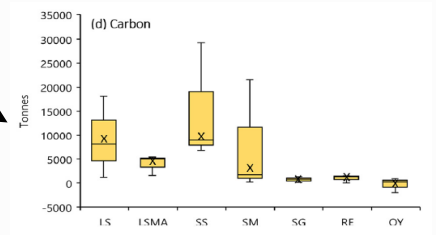
Asset-benefit matrix

Fish & shellfish stocks and aquaculture (£)



Heritage features and community engagement : Value ??





Carbon and nutrients: Value ??

Habitat and species : Biodiversity Value ??

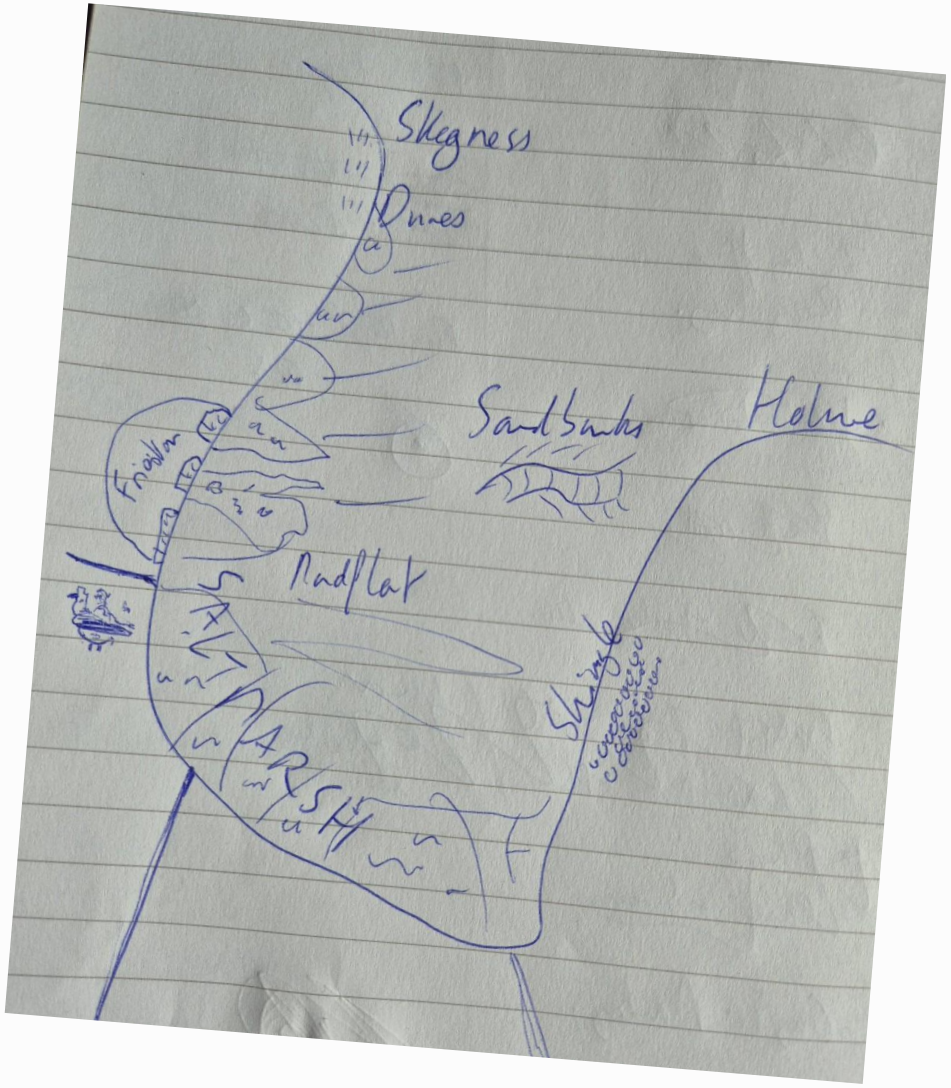
Create your own Natural capital assets maps!

Exercise

…….Think of an account boundary …….

... Draw simple sketch of the area and its natural features
... cartoon style is fine, there are no prizes for artistic ability.

(Anyone else have a sketch they can share?)



(that was the Wash)

Next, you should have been emailed an email with an excel attachment.
Please open the excel file, this is an asset – benefit matrix.

		Natural features												
		Coastal/intertidal						*Subtidal*						
Benefits to people		Beach	Coastal shingle	Reedbeds	Mud	Saltmarsh	*Other (please insert*	Seagrass	Mussel beds	Subtidal sediments	Oyster reefs	Kelp beds	Maerl beds	*Other (please insert*
Products from nature	Wild caught fish and shellfish													
	Farmed fish and shellfish													
	Seaweed													
	Other materials (e.g., ornaments)													
	Other (please insert here)													
Regulating functions	Carbon sequestration													
	Reducing sediment movement													
	Coastal protection													
	Removing nutrients													
	Other (please insert here)													
Other benefits	Aesthetics													
	Education													
	Recreation													
	Biodiversity conservation													
	Other (please insert here)													

Key		•	
Description	Priority	Priority and data available to measure	Not a priority

The matrix uses simple lists of benefits and natural features (assets), but there is space to add detail

Edit the benefits and features to reflect the area you sketched

		Natural features													
		Coastal/intertidal						*Subtidal*							
Benefits to people		Beach	Coastal shingle	Reedbeds	Mud	Saltmarsh	*Other (please insert*	Seagrass	Sandbanks	Mussel beds	Subtidal sediments	Oyster reefs	Kelp beds	Maerl beds	*Other (please insert*
Products from nature	Wild caught fish and shellfish														
	Farmed fish and shellfish														
	Seaweed														
	Other materials (e.g., ornaments)														
	Samphire														
	Other (please insert here)														
Regulating function	Carbon sequestration														
	Reducing sediment movement														
	Coastal protection														
	Removing nutrients														
	Other (please insert here)														
Other benefits	Aesthetics														
	Education														
	Recreation														
	Tourism														
	Biodiversity conservation														
	Other (please insert here)														

Fill out the matrix according the key below it

When identifying priorities, we are interested in the overall value of the benefit to society, and the difference it will make to decision-making

To assess this, take into account:

- *The extent of the different features providing the service*
- *The importance or value of the service to society*
- *That you might not be sure and need to research data, and/or speak to stakeholders*

Data to measure a benefit could be quantitative (e.g. amount of carbon sequestration) or monetary (e.g. value of commercial fish landings)

		Natural features										
		Coastal/intertidal							*Subtidal*			
Benefits to people		Beach	Coastal shingle	Reedbeds	Mud	Saltmarsh	Seagrass	Sandbanks	Mussel beds	Subtidal sediments	Oyster reefs	*Other (please insert here)*
Products from nature	Wild caught fish and shellfish					■	■	■ •	■	■	■	
	Farmed fish and shellfish					■	■	■ •	■	■	■	
	Other materials (e.g., ornaments)											
	Samphire					■						
	Other (please insert here)											
Regulating function	Carbon sequestration			■ •		■ •	■ •					
	Reducing sediment movement											
	Coastal protection	■	■	■	■	■	■	■				
	Removing nutrients			■ •	■ •	■ •	■ •		■ •		■ •	
	Other (please insert here)											
Other benefits	Aesthetics	■	■	■	■	■	■					
	Education	■	■	■	■	■	■	■	■	■	■	
	Recreation	■ •	■ •		■ •	■ •	■ •	■ •		■ •		
	Tourism	■ •	■ •		■ •	■ •	■ •	■ •		■ •		
	Biodiversity conservation	■	■	■	■	■	■ •	■	■	■	■	
	Other (please insert here)											

Key	■	■ •	▨	
Description	Priority	Priority and data available to measure	Not a priority	

Thought experiment complete!

(Is anyone willing to share their matrix?)

As well as your own assessment of priorities, you may also start thinking about:

- *Priority partners to engage with*
- *Key sources of data (e.g. priority habitat maps)*
- *What level of effort/ detail is appropriate to measure different benefits (e.g. modelling of tourism spending or coastal protection benefits)*

Wrap up and close

Dates for next workshops:

WS1: Wednesday 5th June 2024: Natural Capital & Different ways of understanding value

WS2: Wednesday 12th June 2024 : Interlinkages between biodiversity & natural capital

WS3: Wednesday 19th June 2024 : Participatory Mapping

WS4: Wednesday 26th June 2024 : Funding nature's needs

Thank you to all our participants for sharing their experiences and views with us today!

Contact: Steve Stw@pml.ac.uk
Mark: mark@eftec.co.uk
Ian: ian@eftec.co.uk

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Thank you

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