

## North Devon Marine Pioneer

# The benefits of nature

## North Devon's Marine Natural Capital Asset and Risk Register

### What is it?

An asset and risk register is a way to identify all the benefits that come from nature – especially when it is in good condition – and the risks to those benefits.

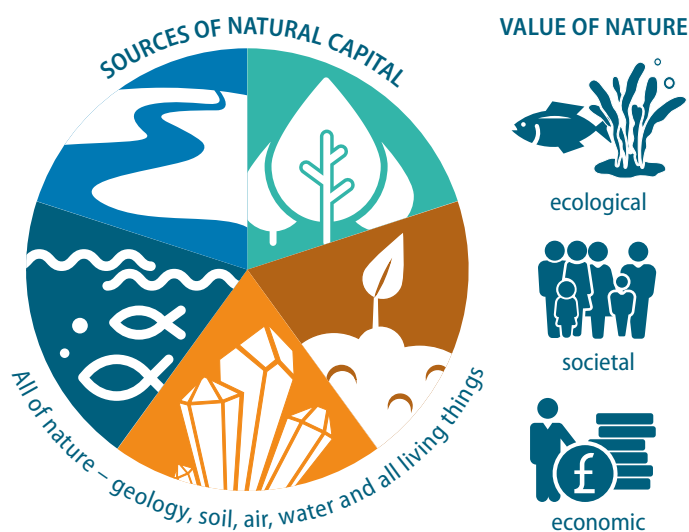
### Why do we need it?

The benefits that come from nature are in decline. We have fewer and smaller fish, less protection from floods, less climate regulation of storms and sea level, less clean water.<sup>1</sup> Listing the benefits of nature and the risks of them being reduced – or even disappearing – helps us work collaboratively to secure these benefits for current and future generations.

### How did we go about it?

An assessment of natural capital assets has been carried out at national scale.<sup>2</sup> But North Devon needed something more detailed to help decision makers identify what risks exist, and how to secure the benefits and value of marine nature for the area. The South West Partnership for Environmental and Economic Prosperity (SWEEP), working with WWF-UK and the Pioneer partnership, developed a Natural Capital Asset and Risk Register for the North Devon Marine Pioneer to test and refine application of the natural capital approach to the marine context. The register will enable targeted recommendations to support sustainable use of natural capital in the North Devon Marine Pioneer.

**Natural capital assets** are sometimes referred to as natural capital stocks or flows. Using the language of accounting can help to emphasise the value of natural assets – as benefits to the economy, or to society, or to nature itself.



### The natural capital approach

The Natural Capital Asset and Risk Register for North Devon Marine Pioneer, which is being developed by SWEEP, is the first ever detailed study for a marine environment.

<sup>1</sup> European Commission (2019) 'Climate change and environmental degradation'. [https://ec.europa.eu/knowledge4policy/foresight/topic/climate-change-environmental-degradation\\_en#developmentsandforecasts](https://ec.europa.eu/knowledge4policy/foresight/topic/climate-change-environmental-degradation_en#developmentsandforecasts)

<sup>2</sup> Mace, G.M., Hails, R.S., Cryle, P., Harlow, J. and Clarke, S.J. (2015) Towards a risk register for natural capital. *Journal of Applied Ecology* 52: 641–653.

## The natural capital approach

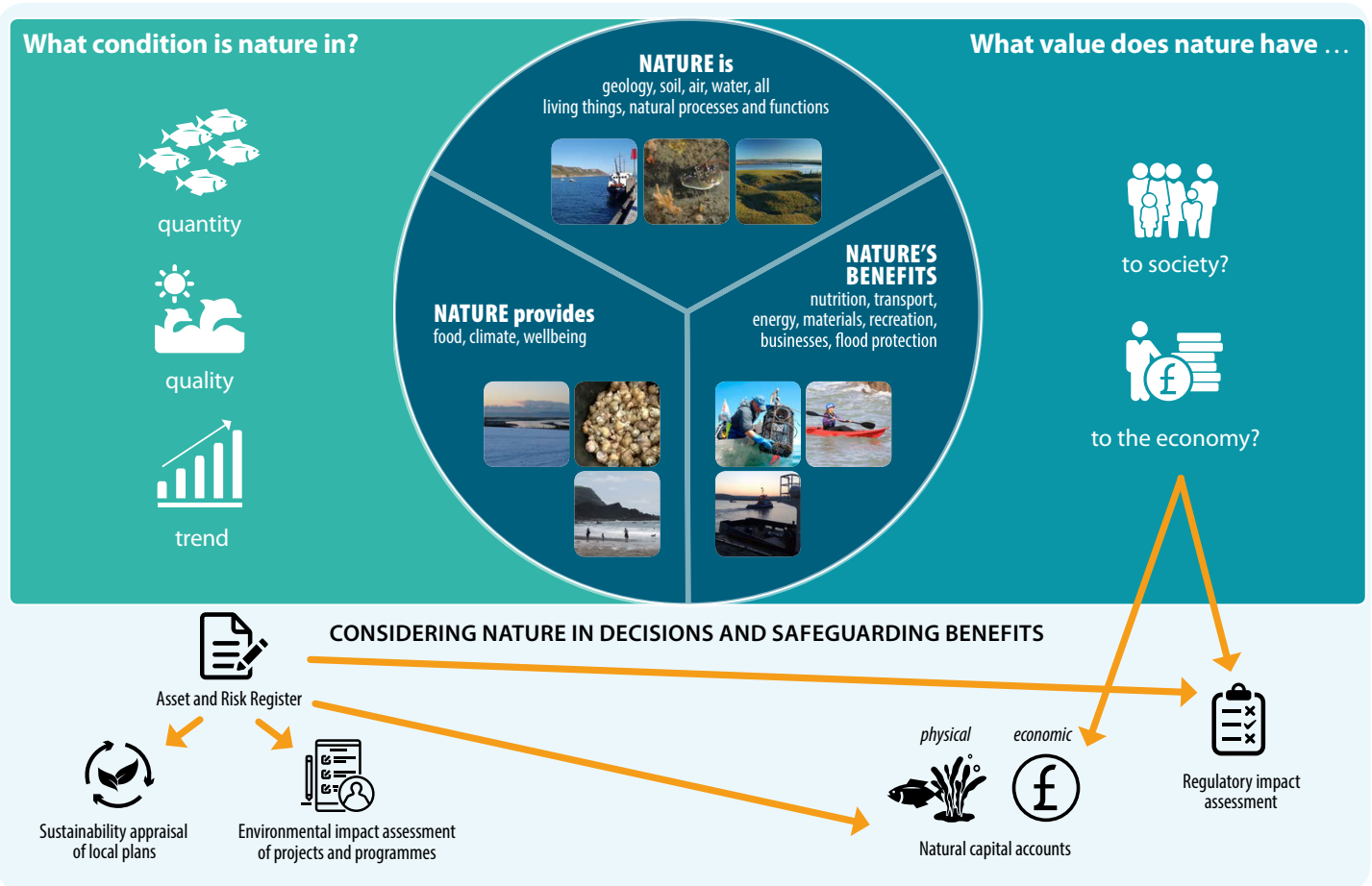


Photo credits: North Devon Biosphere escarp (top row) undervater – Keith Hiscock / (middle row) whale – D&S ifca, Rajakeri North Devon Coast AONB / (bottom row) boats – Roger Hoad

### Recording the assets – a four-step approach

1. What are the assets?
2. What ecosystem service benefits are linked to those assets?
3. Where are they linked?
4. What condition are the assets in?

We defined North Devon's assets within each habitat (pictured opposite) and mapped their extent, then looked at the literature and expert opinion to determine the level of provision of each ecosystem service from each habitat.<sup>3</sup>

Ecosystem services may be:

- provisioning – providing food and other direct resources
- regulating – controlling vital environmental processes such as climate and water quality
- cultural – supporting mental and physical health.

<sup>3</sup> Ashley, M., Rees, S.E. and Cameron, A. (2018) *North Devon Marine Pioneer 1: State of the art report of the links between the ecosystem and ecosystem services in the North Devon Marine Pioneer*. A report to WWF-UK by research staff of the Marine Institute at the University of Plymouth; Rees, S.E., Ashley, M. and Cameron, A. (2019) *North Devon Marine Pioneer 2: A Natural Capital Asset and Risk Register*. A SWEEP/WWF-UK report by research staff of the Marine Institute at the University of Plymouth.

### How can we understand the risk?

One way is to categorise risk according to how an asset–benefit relationship is performing against relevant policy targets. North Devon's Asset and Risk Register assesses the extent and condition of the asset–benefit relationship against targets across a range of policies:

- [Convention on Biological Diversity and Sustainable Development Goal 14](#)
- [Habitats Directive](#)
- [Common Fisheries Policy](#)
- [Water Framework Directive](#)
- [Bathing Waters Directive](#)
- [Marine Strategy Framework Directive](#)
- [Marine and Coastal Access Act 2009](#)
- [Biodiversity Strategy](#)

Risk scores may be high (red), medium (amber) or low (green), based on whether the benefit level is currently above or below target, and whether the asset is deteriorating and, if so, how rapidly.



## Involving the community in calculating risk

Traditionally, risk is calculated as:

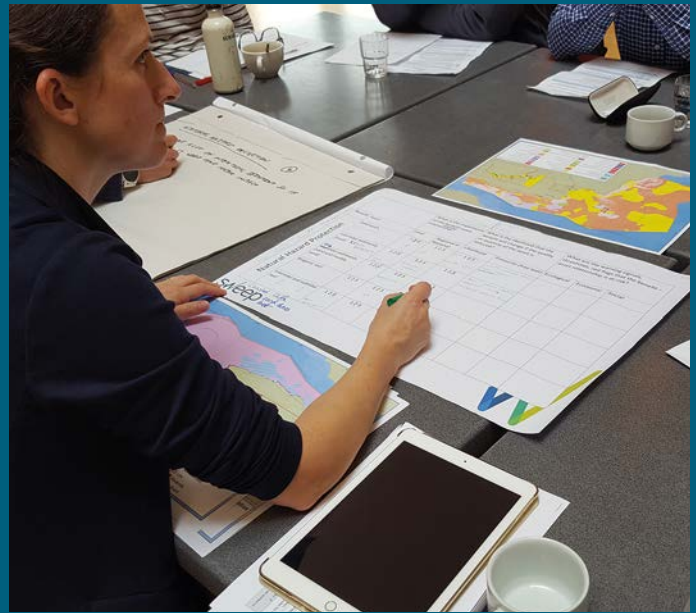
- **risk** = trend in status × status of a benefit in relation to policy targets

To take account of local perceptions of risk, we asked stakeholder members of the North Devon Marine Working Group to assess the:

- importance of a benefit–asset relationship (risk exposure)
- likelihood that a benefit will change if the quality or quantity of the asset is reduced (sensitivity to change)
- warning signals, thresholds or red flags that a benefit–asset relationship is at risk.

This allowed us to calculate:

- **community-based knowledge of risk** = risk exposure × sensitivity to change



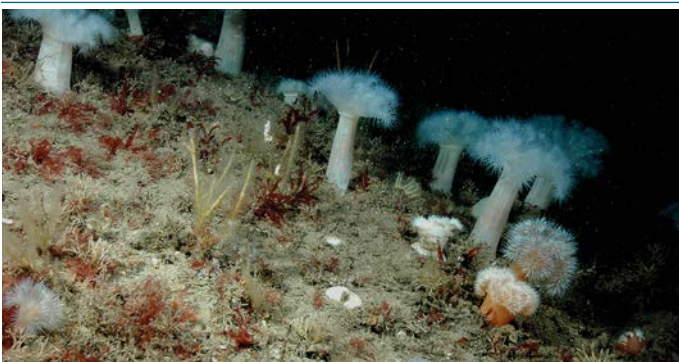
## North Devon's habitats



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## What does North Devon’s Asset and Risk Register tell us?

Most asset–benefit relationships are at medium to high risk of loss. There are particular risks to future benefits

from food (wild food fish and shellfish); clean water and sediments; and recreation and tourism. Community-based knowledge supports this finding. Understanding these risks helps us to identify potential management options and collaborative solutions.

<p><b>Food production (fisheries):</b></p> <ul style="list-style-type: none"> <li>➤ The three-dimensional structure of saltmarsh vegetation during high tide gives shelter and food for juvenile fish.</li> <li>➤ Reefs (including biogenic reefs, where the structure is created by the animals themselves) and kelp (seaweed) communities provide shelter and food for young fish, crustaceans and molluscs that are commercially targeted.</li> <li>➤ Sediment habitats (a vast area of the reserve) are a significant provider of food for fish.</li> <li>➤ The water of the ocean is important for wild food. The currents of the sea and its chemical composition, how the water is layered (different densities, temperatures and nutrients), and how much or little the layers mix are all important. Also vital is primary production – when the plants in the sea make their own food using just the sun, water and air.</li> </ul>	<p><b>At high risk</b> due to the extent of sublittoral habitat currently without management objectives, and with impaired quality due to previous fishing activity.</p> 
<p><b>Healthy climate:</b></p> <ul style="list-style-type: none"> <li>➤ Saltmarsh plant, algae and kelp communities and soft substratum sediments capture and store carbon.</li> <li>➤ Marine living organisms contribute to the balance and maintenance of the atmosphere’s and oceans’ chemical composition.</li> </ul>	<p><b>At risk</b> due to the degraded quality of saltmarsh and rock/reef habitats.</p> 
<p><b>Sea defences:</b></p> <ul style="list-style-type: none"> <li>➤ Physical structures such as reefs dampen wave energy from tidal surges and storms.</li> <li>➤ Saltmarsh stores floodwater and reduces water currents and wave energy.</li> <li>➤ Sediment habitats dissipate wave energy, reducing the risk of damage to coastal defences and flooding of low-lying land.</li> </ul>	<p><b>At risk</b> due to fragmented habitats and degraded quality.</p> 
<p><b>Tourism and recreation:</b></p> <ul style="list-style-type: none"> <li>➤ Clean water is central to water sports, wildlife watching, fishing, appreciating scenery, swimming outdoors, and enjoying the beach (sunbathing or paddling).</li> <li>➤ Saltmarsh provides coastal access points, nature watching, species for recreational fishing and foraging, and aesthetic interest.</li> <li>➤ Littoral sand and coarse and mixed sediments provide beaches and coastal access points.</li> </ul>	<p><b>At risk</b> due to degraded habitats and instances of poor water quality.</p> 
<p><b>Flows of clean water:</b></p> <ul style="list-style-type: none"> <li>➤ Vegetation in saltmarsh baffles water currents and stabilises sediments, which store organic matter, nutrients, carbon, nitrogen and phosphorus; the remaining organic material is recycled or exported.</li> <li>➤ Organisms living on the seabed in soft substratum habitats rework the sediment by burrowing, which enables nutrient cycling.</li> </ul>	<p><b>At risk</b> due to historical fishing pressure in sublittoral sediment habitats limiting the structure and function of habitats.</p> 



## What are the next steps?

Sectors of North Devon's economy depend heavily on the maintenance and restoration of these asset-benefit relationships. How to underpin these benefits is the challenge faced by North Devon's community, managers and policy makers. Securing the benefits for current and future generations will need collaboration – especially across land and sea, as the risks are also related to activities such as farming.

The Marine and Landscape Pioneers are considering how to combine their efforts to secure nature's benefits. The [Landscape Pioneer Strategy](#) highlights similar priority areas in North Devon, including water quality, tourism, food production and restoration of coastal habitats.

An overriding feature of North Devon's Asset and Risk Register is the range of habitats – both with and without current conservation designations (such as

Marine Protected Areas). More holistic management will be needed that takes account of all the vital interactions and processes across the whole of the sea and ocean. This is recognised by the Government's [25 Year Environment Plan, A Green Future](#), which aims to reverse the decline in nature's benefits. The plan's ambition will need us to make changes in how we manage nature, especially through more collaborative work. In some cases this will need investment in management, and more innovative sources of funding from private and public sources. That is why the Pioneer is also investigating new mechanisms for funding.

## Project partners

- [University of Plymouth Marine Institute](#)
- [WWF-UK](#)
- [SWEEP](#)



This project is a contribution to the North Devon Marine Pioneer.  
For updates visit our website: [northdevonbiosphere.org.uk/marinepioneer.html](http://northdevonbiosphere.org.uk/marinepioneer.html)  
Read the full report, [A Natural Capital Asset and Risk Register](#)

