

INSITE

Influence of
man-made
structures in
the ecosystem

Role of man-made structures in the ecosystem – insights from the North Sea

Professor Dickon Howell

INSITE Programme Director

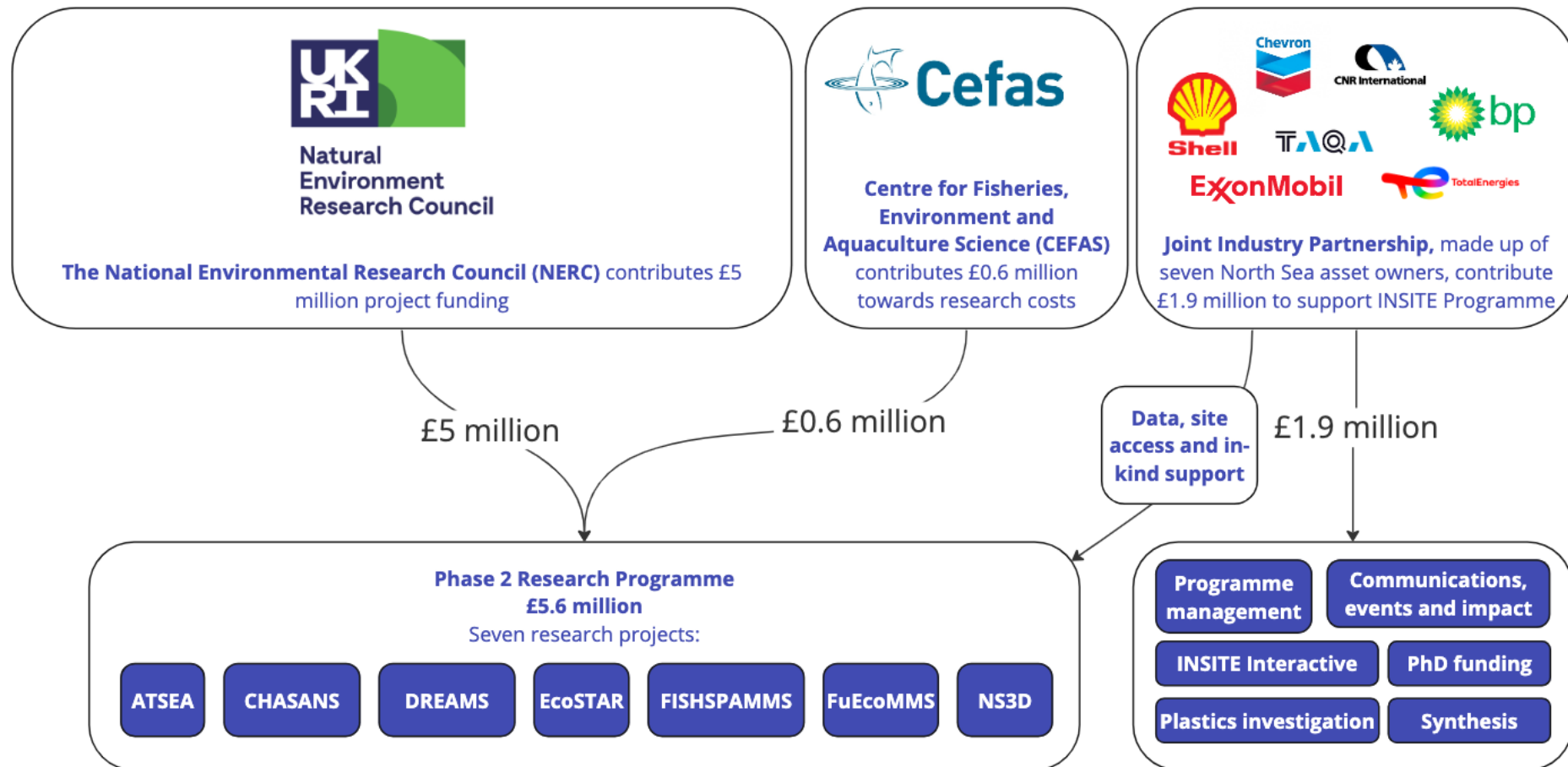
November 2023




INfluence of man-made Structures In The Ecosystem

Objective:

“To provide stakeholders with the independent scientific evidence-base needed to better understand the influence of man-made structures on the ecosystem of the North Sea”



**The role of the scientist is not to decide
between the possibilities but to determine
what the possibilities are**



Lord May 1990 (Chief Scientist to the UK Government 1995–2000)

The Challenge

- Thousands of artificial structures in the sea
- Many approach end-of-life or require insight into how to plan for future decommissioning

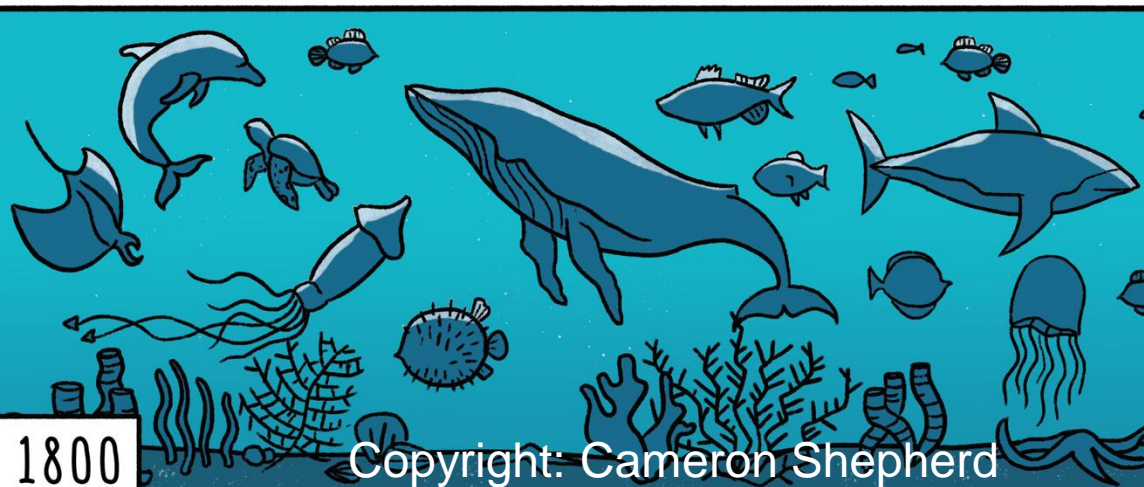
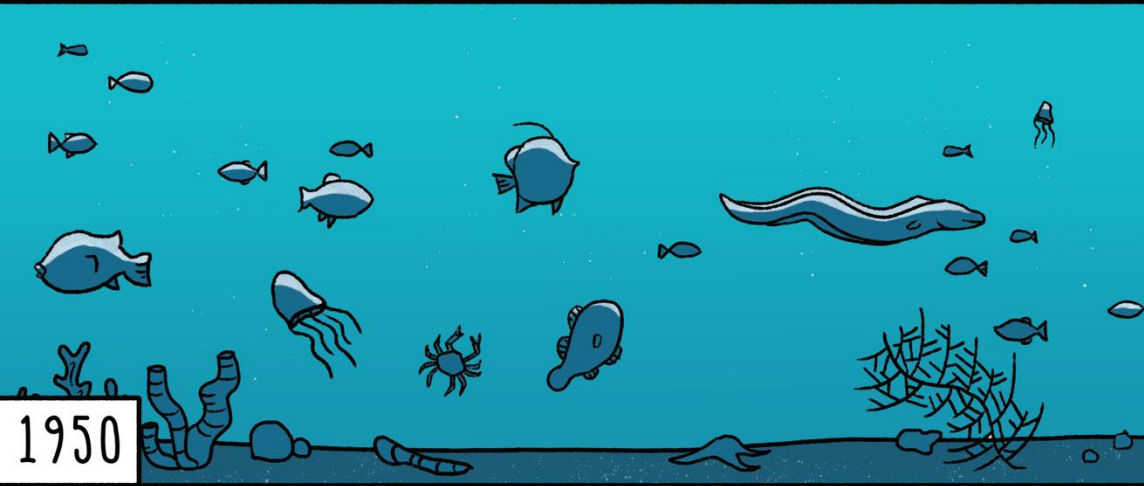


The Challenge

- Thousands of artificial structures in the sea
- Many approach end-of-life or require insight into how to plan for future decommissioning
- Creation of multiple pressures and effects as a result of structures.
- Which decommissioning option(s) result in optimal environmental and societal outcomes?



Shifting Baseline Syndrome



Copyright: Cameron Shepherd

North Sea hard substrate ecosystem

INSITE

- What **could** the future look like?
- At what scales could and should ecosystems be restored?
- How should restoration sit alongside decommissioning processes and support the transition to Net Zero?
- Opportunities
 - to reduce fragmentation and promote ecological coherence
 - to enhance regional ecosystem services

INSITE Phase 2: NERC-Funded Programme: 2020-2023

INSITE

Dr Debbie Russell St Andrews University	EcoSTAR: Ecosystem level importance of Structures as Artificial Reefs
Dr Daniel Jones NOC	Autonomous Techniques for anthropogenic Structure Ecological Assessment (ATSEA)
Prof. Paul Fernandes University of Aberdeen	Aggregation, production and spillover: the cumulative effect of man-made offshore structures on fish
Dr Natalie Hicks University of Essex	Functionality and Ecological Connectivity of Man-Made Structures (FuECoMMS)
Dr Antony Knights University of Plymouth	Decommissioning - Relative Effects of Alternative Management Strategies (DREAMS) AND INSITE Synthesis project (Synthesis)
Prof. Joanne Porter, Heriot-Watt University	Connectivity of Hard Substrate Assemblages in the North Sea (CHASANS)
Dr Thomas Wilding SAMS	Application of novel 3D imaging techniques to quantify biomass and secondary production associated with North Sea artificial structures (NS3D)
Prof Richard Thompson University of Plymouth	Decommissioning and subsea plastics (Plastics) *Industry funded only



- Complete decommissioning and removal of MMS can have a negative effect on ecosystem services from the current baseline
- Considering options such as partial removal or leaving structures in place can be beneficial as these structures can support biodiversity and ecosystem restoration



- Partial removal or leaving structures intact, can support biodiversity and restore ecosystems in a manner similar to natural complex ecosystems
- MMS develop into complex 3D systems and play a comparative role to the local environment as some natural systems, albeit with different functionality



- Increase in biomass associated with the transition to hard substrates and the creation of offshore intertidal habitats.
- Elevated densities of fish at greater distances than previously found around most, but not all, MMS
- We should recognise the importance of considering the wider ecological community and ecosystem shifts



- Repurposing or abandoning individual or multiple structures in place could contribute to most of the 35 environmental targets and aspirations identified by the United Nations and OSPAR.
- Different decommissioning options, have a diversity of effects and ecological outcomes that are considered desirable and undesirable from an environmental, ethical, and societal standpoint.
- Choice of decommissioning option(s) requires policymakers and managers to prioritise some targets over others

1.
Marine Biodiversity
15 Feb

2.
**Environmental
Restoration/Net Gain**
18 Apr

3.
**Offshore Wind
Deployment**
25 May

4.
**Cumulative Effects
Assessments**
6 Jul

5.
Commercial Fishing
31 Oct
1130 – 1300 GMT

6.
Marine Monitoring
29 Nov
1130-1300 GMT

Next steps: Phase 3

INSITE

Phase 1
Complete 2017

Phase 2
To complete
2024

Phase 3
To start
Summer 2024



- The climate and biodiversity crises are real, and we need to focus on restoration of our marine environment at all opportunities
 - Scale of challenge means industry, government, NGOs and academia must work together
 - Agreement on the evidence base is key to effective collaboration
-

INSITE

Influence of
man-made
structures in
the ecosystem

Thank you

General queries: info@insitenorthsea.org

Website: <https://insitenorthsea.org/>



@insitenorthsea



INSITE NORTH SEA

