

eftec

Economics for the
Environment
Consultancy

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Ian Dickie, eftec

Marine Biodiversity Offsets ~ UK Scoping Study



Introduction

- Project Objectives
- Similarities and differences to terrestrial biodiversity offsetting
- Scale challenges
- Potential offset actions
- How might it work?
- Going forward

Project objectives

- In context of UK policies:
 - Terrestrial biodiversity offsets pilots
 - EU ‘no net loss’ objectives
 - New Marine laws & planning
- Phase 1: Scope potential for using biodiversity offsets in UK marine environment
- Phase 2: Two hypothetical case studies to test out potential application (e.g. metrics) and implications
- Workshop with expert stakeholders to gain wider views/reaction
- Genuinely open research question

Project objectives

- Multi-disciplinary team:
 - Ian Dickie, economist, eftec
 - Jo Treweek, ecologist with offsets expertise
 - Liam Macleese, Marine Planning Consultants
 - Bryony Pearce, Marine Ecological Surveys

- The Crown Estate business approach: commercialism, integrity and stewardship
<http://www.thecrownestate.co.uk/about-us/>

- Contribution to sustainable development

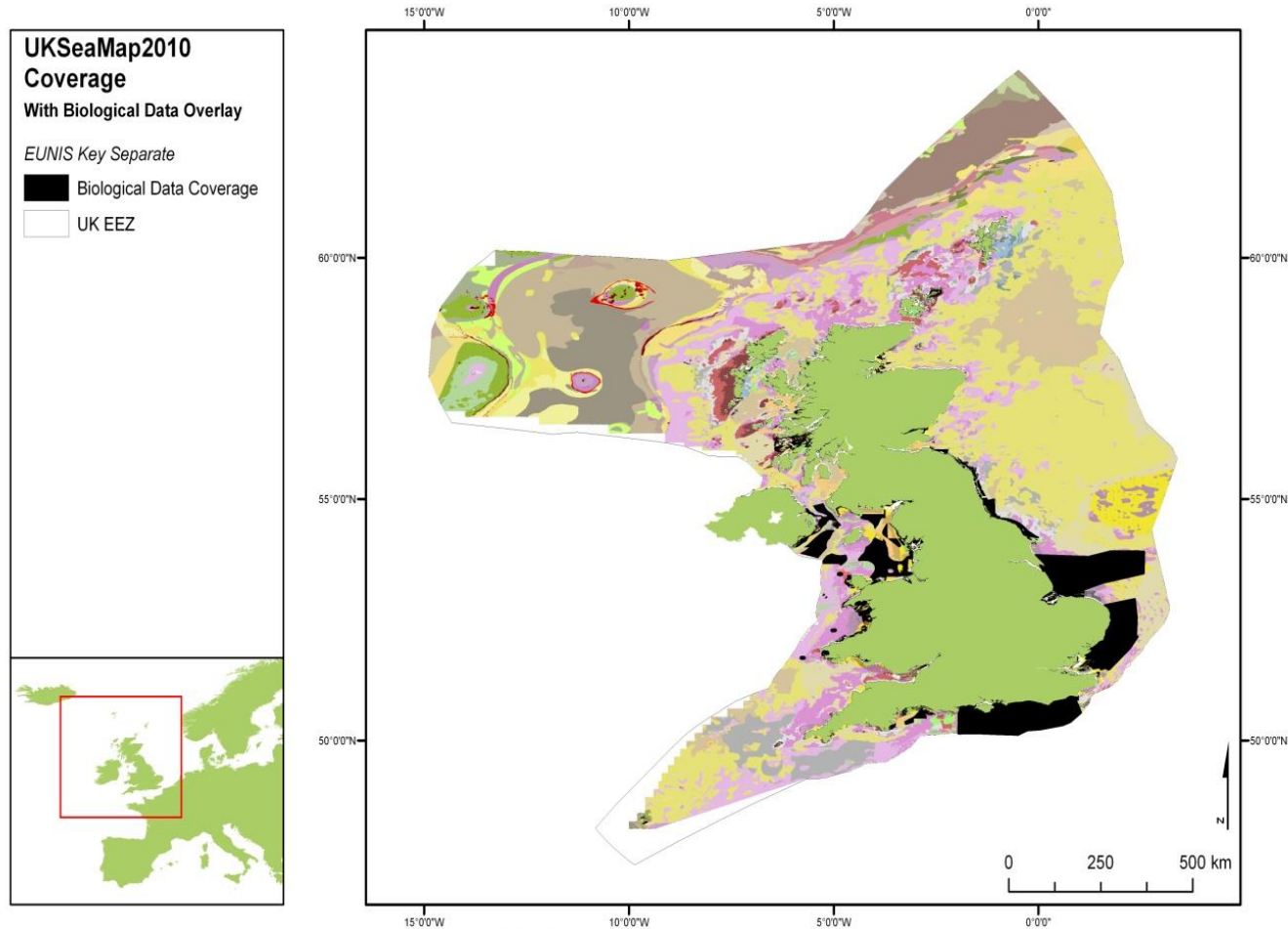
Similarities to terrestrial offsetting

- Can identify biodiversity pressures and status
- Follow the mitigation hierarchy (our case studies look at this)
- Can use ‘area x quality’ metrics
- Activities driving biodiversity loss, some have ‘trigger points’

Similarities to terrestrial offsetting

- Climate change uncertainty (maybe greater than terrestrially)
- Menu of offset activities: Restoration; Re-creation; Creation; Averted Risk; Preservation
- Mainly looking outside existing PA network (which still being established in marine environment)

Chart showing the UKSeaMap (2010) biotope map overlaid with the core areas of biological data



Differences with terrestrial offsetting

- Legal/planning/protected area systems still developing
- Environmental differences:
 - More dynamic
 - Three-dimensional
- Greater transboundary issues
- More features non-offsettable

Matrix illustrating which pressures might benefit from offsets, and which habitats and species biodiversity offsets would be suitable if residual impacts occurred as the result of these pressures

		Over Exploitation	Pollution	Habitat Destruction	Non-Native Species Introductions	Climate Change
HABITATS	Designated Conservation Sites (SACs, SPAs, SSSIs etc)					
	Marine Conservation Zones					
	Voluntary No-Take Zones					
	Non-designated BAP Priority Habitats					
	Non-designated Annex 1 Habitats					
	Other marine habitats					
SPECIES	Annex IV Species					
	BAP Priority Species					
	IUCN Red List Species					
	Annex II Species					
	Other Species					

Key:

	Offsetting would not be suitable
	Limited offsetting potential
	Combination is well suited to offsetting principles

Scale Challenge

- Mobile nature of many marine species (and even habitats), means that in-situ conservation less easy
- This presents a challenge for biodiversity offsets
- Think at a larger scale about:
 - The wide range of pressures affecting biodiversity
 - Population level actions to achieve nnl

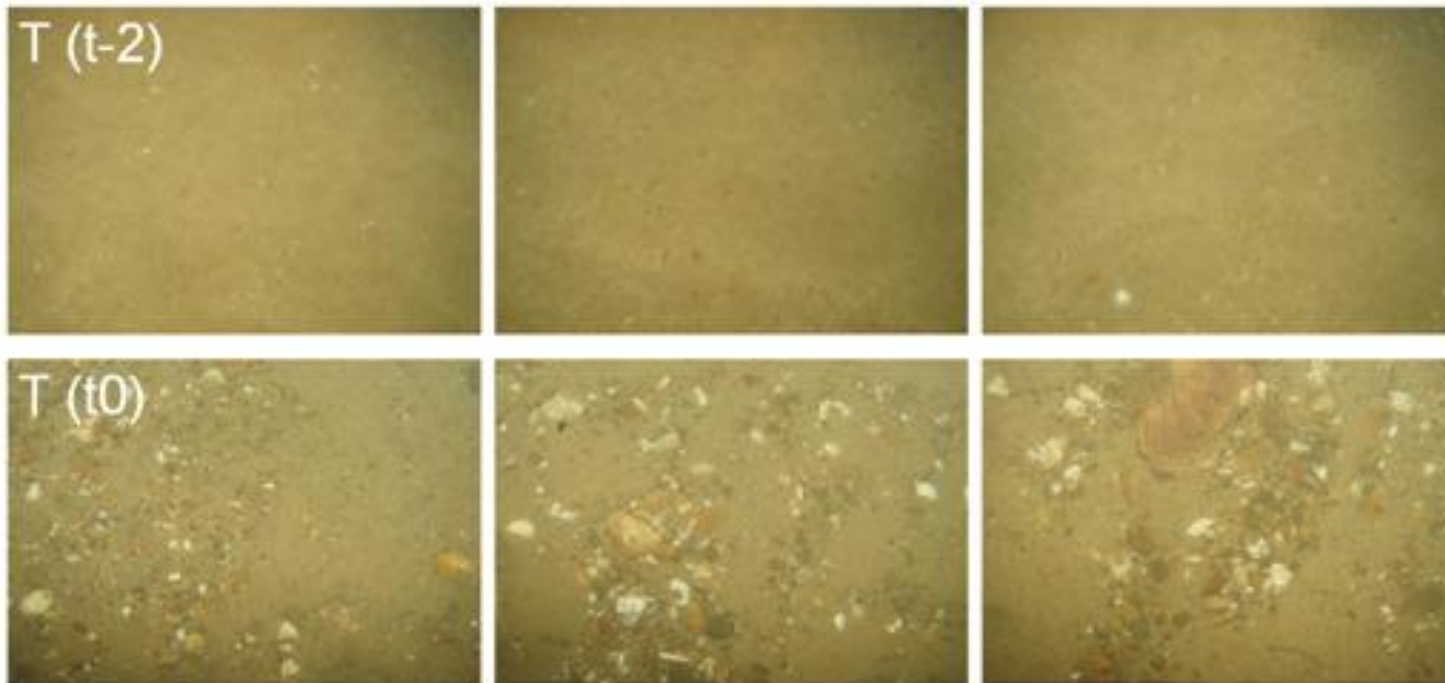
e.g. migratory fish species interventions at other stages of life cycles

e.g. integrity of habitat networks

Potential offset actions

Type of Offset	Example Activity
Habitat Restoration	<ul style="list-style-type: none"> • Biogenic reef restoration • Enhanced connectivity of Marine Protected Areas • Enhanced protection of Marine Protected Areas
Habitat Recreation	<ul style="list-style-type: none"> • Sediment seeding
Habitat Creation	<ul style="list-style-type: none"> • Artificial reefs
Averted Risk	<ul style="list-style-type: none"> • Eradication of Invasive Alien Species • Reversing Pressures for a given site
Preservation	<ul style="list-style-type: none"> • Species protection measures in fisheries • Seal colony protection • Other species protection measures in breeding colonies
Research	All relevant topics

Images showing an increase in the proportion of exposed gravel following gravel seeding (from Cooper et al., 2011a).



Artificial reefs



Potential offset actions

- Biogenic reef restoration?
 - UK reef building species: mussels, native oyster, *Sabellaria* (worms)
 - Research to identify and map historic distributions of these reefs could identify suitable areas for restoration
 - Highly sensitive to human activities
 - Potential costs: *Sabellaria* £180k/100m², shellfish £29k per 100m²
- Averted risk: eradication of IAS?
 - Invasive alien species are major threat to UK marine environment
 - Control mammals on seabird islands
 - Control risk of introduction through vessels

How might it work?

- Estuarine case: biodiversity offsets requirements for nnl of all biodiversity, so stricter than EU Habitats Directives requirements
- Wind farm case: soft substrate shallow water development, offset residual impacts by:
 - Restore seabed habitats, possibility to trade up to biogenic reef
 - Species: relieve pressure on bird breeding sites



Important
area for
feeding birds



Please do not exercise dogs

Clear Bank and the Foel Nature Reserve Tel: 01295 702579

How might it work?

- Incomplete nature of marine biodiversity protections means there are opportunities for averted risk offsets
- Scale issues means that pooled offsets may be more suitable approaches, addressing pressure at larger scale

How might it work? - metrics

- Area x quality for biodiversity features with clear spatial boundary
- Potential metric for habitat loss from soft seabed habitats:

Abundance Lost = Mean Benthic Species Density x Mean
Abundance of Benthic Fauna

- Equivalence calculation possible on this basis

Going forward

- Offset through enhancements made to benthic biodiversity by trading up from one (lower ecological value) habitat type to another habitat type, such as biogenic reefs.
- Metrics for calculating damage and offsets are described based on species diversity and abundance.
- A more ecosystem-based approach, which considers several individual projects or for a development programme, for which pooled offsets larger areas of sea may provide more ecological benefits.

Going forward

- Applying biodiversity offsets to marine environment has limitations and still uncertain in many areas
- It can be another useful tool for marine management
- Should be researched further - as marine spatial planning systems develop opportunities for use may increase.

Thank you!

ian@eftec.co.uk

www.eftec.co.uk

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<http://cowburps.wordpress.com/>

