

# The Crown Estate's perspective on the potential usefulness of marine biodiversity offsetting

Mike Cowling  
*Chief Scientist*



## Role of The Crown Estate in the UK

- The Crown Estate is a public body
- Manages ~50% UK foreshore and almost all seabed out to 12nm.
- **Substantial Rural holdings adjacent to the coast**
- Energy and mineral rights out to 200nm
- Operates under The Crown Estate Act 1961
- Duty to maintain and enhance the value of the estate and return from it
- Due regard for principles of good management
- Stewardship is a Core value
- The Crown Estate is not in any sense a Regulator for activities on its estate



## The Crown Estate & Marine Offsetting

- The Crown Estate has funded two recent studies
- Report on website:



<http://www.thecrownestate.co.uk/media/397708/marine-biodiversity-offsetting-uk-scoping-study.pdf>

- 2<sup>nd</sup> report: 'Marine habitat banking and biodiversity study' at final edit stage and will be available on website page at <http://www.thecrownestate.co.uk/energy-infrastructure/research/seabed-and-coastal-research/reports/>



## Rural Estate view

- Biodiversity offsetting is a useful concept
- In the terrestrial environment it offers the prospect of simplifying development
- The danger is that it will lead to an additional layer of complexity and thus be a burden rather than an advantage
- Q31, Q32, Q33 and Q37 are key to future success
- For land adjacent to the coast, the technique is not yet sufficiently well articulated to be useful



## What will Offsetting look like?

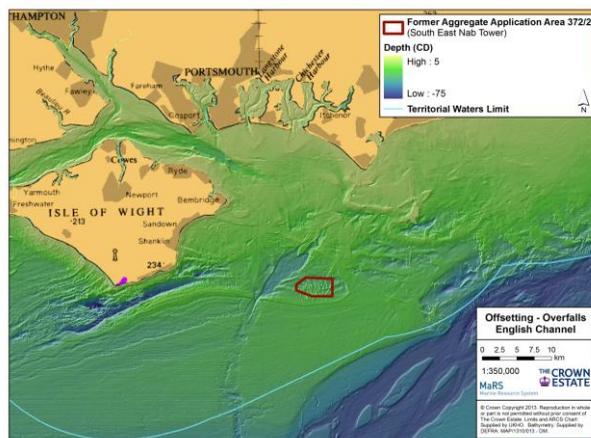
- **Restoration:** Changes (physical, chemical and/or biological) to a degraded site to enhance functions or communities
- **Creation:** Changes (physical, chemical and/or biological) to a site to develop a habitat that did not exist
- **Averted Risk:** Protection of biodiversity at risk of loss or degradation
- **Preservation:** Action to remove a threat to condition of habitat or species

(Dickie, I. et al, 2013; Bean et al 2008)



## Averted risk/preservation

- **Overfalls area:** Agreement with local Conservation group not to lease for extraction



- Leases of coastal areas for conservation, eg RSPB reserves



# Habitat restoration

- Lymington – salt marsh restoration – 2 reports at: <http://www.thecrownestate.co.uk/energy-infrastructure/research/seabed-and-coastal-research/reports/>

Colonisation 1 year after first phase

Levels after phase 2



View to S-E



# Habitat creation

- 'Islands in the Severn' c/w Eastern Scheldt

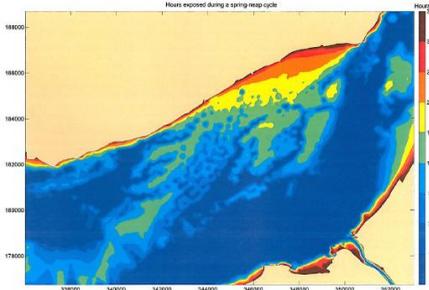


Figure 4.7: Existing intertidal area at the Welsh Grounds and associated exposure times

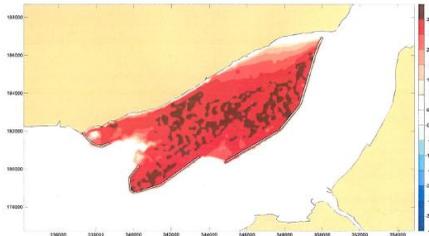


Figure 3.23: Bed change for completed scheme at Welsh Grounds

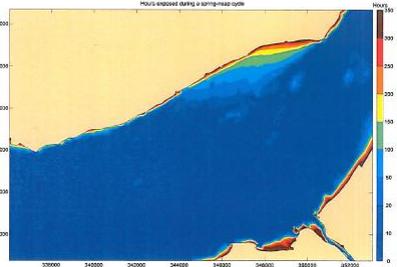


Figure 4.8: Intertidal area at the Welsh Grounds with the R3 barrage scheme implemented and associated exposure

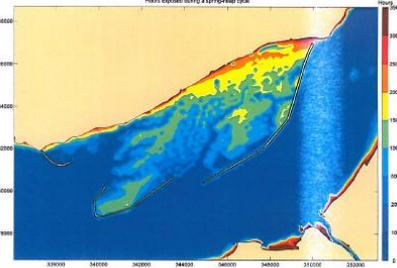


Figure 4.9: Intertidal area at the Welsh Grounds with the habitat creation scheme implemented and associated exposure

(300 islands created in RSPB freshwater reserves)



## Habitat creation

- Sand / shingle engine
- Again, follows from work in Holland
- ‘Building with Nature’ Ecoshapes Project
- Rarely justified financially on habitat issues or coastal erosion and flood protection alone
- Needs socio-economic benefits too
- An agent for regeneration of coastal areas



### The Sand Engine Concept

*“A large-scale beach nourishment that works with nature to meet flood and coastal management objectives while also delivering additional social, economic and environmental benefits over a period of time.”*

*Building with Nature*

*Future-proofing*

*Shoreline-changing*

*Efficiency*

*Enhancement*

*Protection*



#### Case study: Delfland Sand Engine, The Netherlands

Flagship ‘Building With Nature’ project

In 2011 21.5million m<sup>3</sup> sand was placed, designed in such a way that processes will transport the sediment downdrift, increasing protection along the coast – ecodynamic design.

Benefits include:

- Meets the legal requirement for flood defence
- Economies of scale: 50% reduction in cost of sand
- Reduction in nourishment frequency from every 5 years to every 20 years resulting in less habitat disturbance on borrow areas and replenishment zones
- Increased amenity opportunity; the Dutch capital of kite surfing

## Feasibility studies funded by The Crown Estate

- Can the 'sand engine' concept be applied in UK?
- Feasibility studies North Wales and Lincolnshire
- Suffolk?
- Initial Technical Issues: shingle and volumes
- Working in collaboration with SCDC



## Opportunities for the Suffolk Coast



### Socio-economic regeneration

Reinforcing existing coastal use - tourism  
Creating the opportunity for change - regeneration

### Environmental Enhancement

Important region for environmental designations  
Opportunities for habitat enhancement and creation  
Reducing conflict

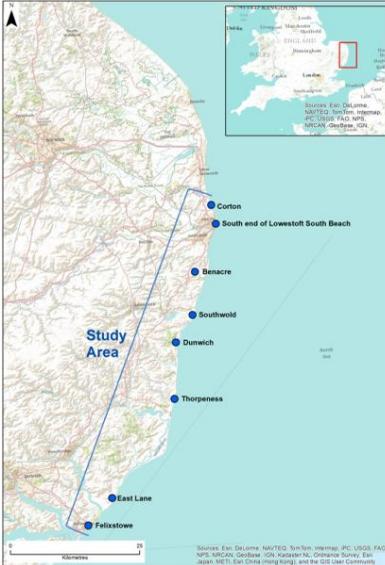
### Flood and Coastal Erosion Risk Management (FCERM)

Vulnerable, low lying coastal areas.  
On-going erosion  
Re-thinking timescale for adaptation

### Efficiency

Essential because of Partnership Funding  
Broader scale longer term approach  
Operational efficiencies

## Feasibility study



- Shingle engine has 3 possible actions
- **Reshaping beach profile** – immediate benefit to eroding coast
- **Source of sediment supply** – place in known source area, using known drift to feed areas in need of increased and regular supply
- **Super-nourishment** – alter function of coastline of large area and provide new opportunities for activities
- Using the existing form, features and historical development of the coast to guide development of options and assess potential
- Creating a different landscape for management at a different scale



## Feasibility study

<p><b>Lowestoft:</b> The northern end of South Beach tends to periodically erode with beach behaviour being strongly related to the behaviour of the nearshore sand banks. Beach levels tend to improve with distance towards the south, although erosion has occurred in this area as well. The headland at Pakefield acts as a control point along this frontage and this headland comes under pressure for erosion. Significant flood risk exists to the centre of the town, with the flood route being located at the northern end of South Beach. The existing beach is linked to tourism and the frontage provides a core amenity for the wider hinterland. There is an opportunity to strengthen this core use.</p>	<b>FCERM</b>		
	Level of risk/ requirement	H	Red bar
		M	Yellow bar
		L	Green bar
	<b>TOURISM</b>		
	Dependency on sediment	H	Red bar
		M	Yellow bar
		L	Green bar
	Present condition	H	Red bar
		M	Yellow bar
		L	Green bar
	Opportunity for enhancement	H	Red bar
	M	Yellow bar	
	L	Green bar	
<b>ECOLOGY</b>			
Ecological significance of sediment	H	Red bar	
	M	Yellow bar	
	L	Green bar	

- Site assessment on a range of criteria as a function of distance along the coast
- Assessment on 'High', 'Medium' and 'Low' basis
- Leads to prioritisation of locations





## Marine Biodiversity Offsetting: Uncertainties

- As before: Q31, Q32, Q33 and Q37
- Q29
- Trading?
- Q30
- Lack of a strategic approach to offsetting to achieve net ecological gain
- Compliance? Penalty, incentive or enabling?



## Conclusions

- Marine biodiversity habitat offsetting potentially takes many forms
- Key is what sorts of offsetting will be acceptable and what developments can use it
- Potential for additional bureaucracy is a concern
- A robust scheme could provide substantial ecological gain; allow economic development of infrastructure and serious economic regeneration for coastal communities



## Further information:

Prof Mike Cowling

[mike.cowling@thecrownestate.co.uk](mailto:mike.cowling@thecrownestate.co.uk)

+44 (0)20 7851 5032

