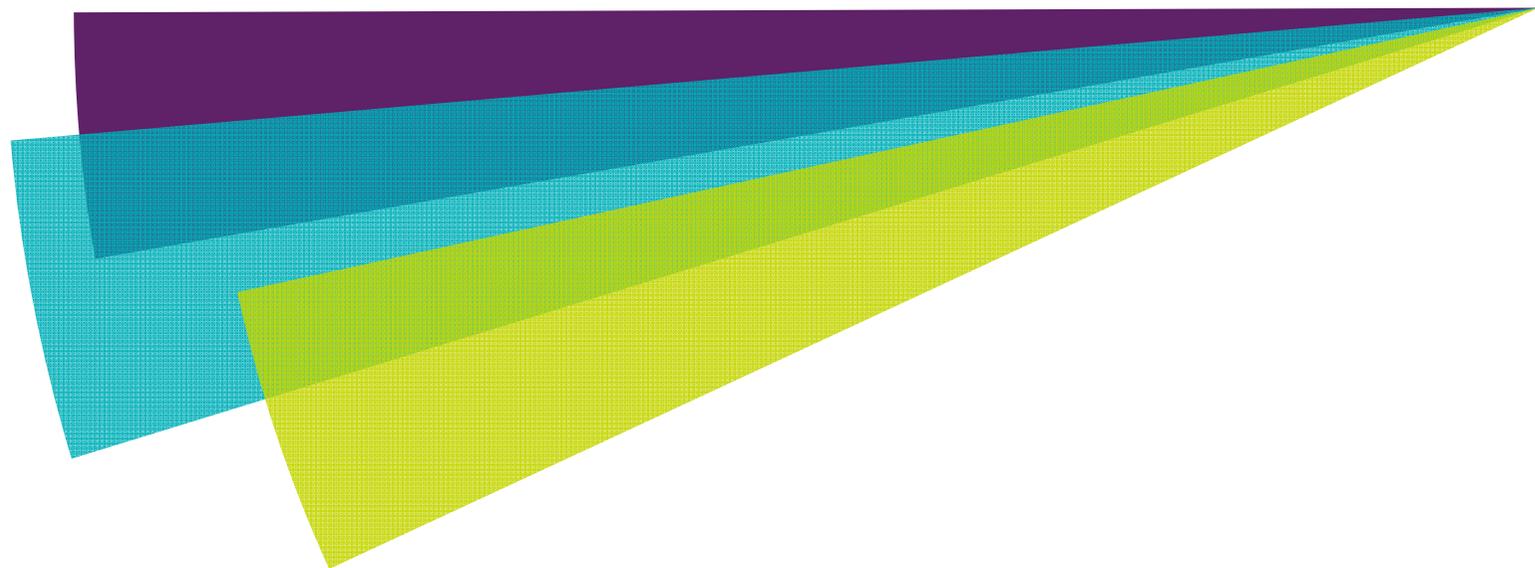


# Eco-moorings as management options for MPAs



Natalie Hirst & Jennifer Wilson



# Purpose of this study / Project overview

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- To undertake a review of eco-moorings experience, and complete a subsequent assessment of the technology as a feasible management option for Marine Protected Areas (MPAs), focusing primarily on funding mechanisms.
- Commissioned on behalf of Defra by the Marine Biodiversity Impacts Evidence Group (MB IEG).
- Objectives
  - Gather further evidence and information on:
    - Practical use of eco-moorings in UK environments and habitats
    - Cost of eco-moorings
    - Insurance of eco-moorings and vessels utilising them
  - Generation of 'realistic options' for funding the installation and maintenance of eco-moorings.
  - Key tasks:
    - Literature review
    - Consultation with stakeholders
    - Cost model
    - Scenario development

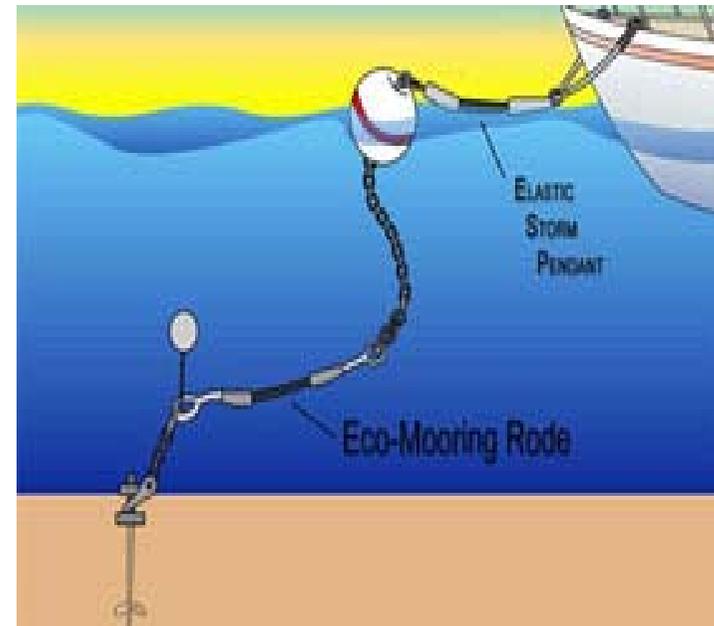
# Summary of an eco-mooring

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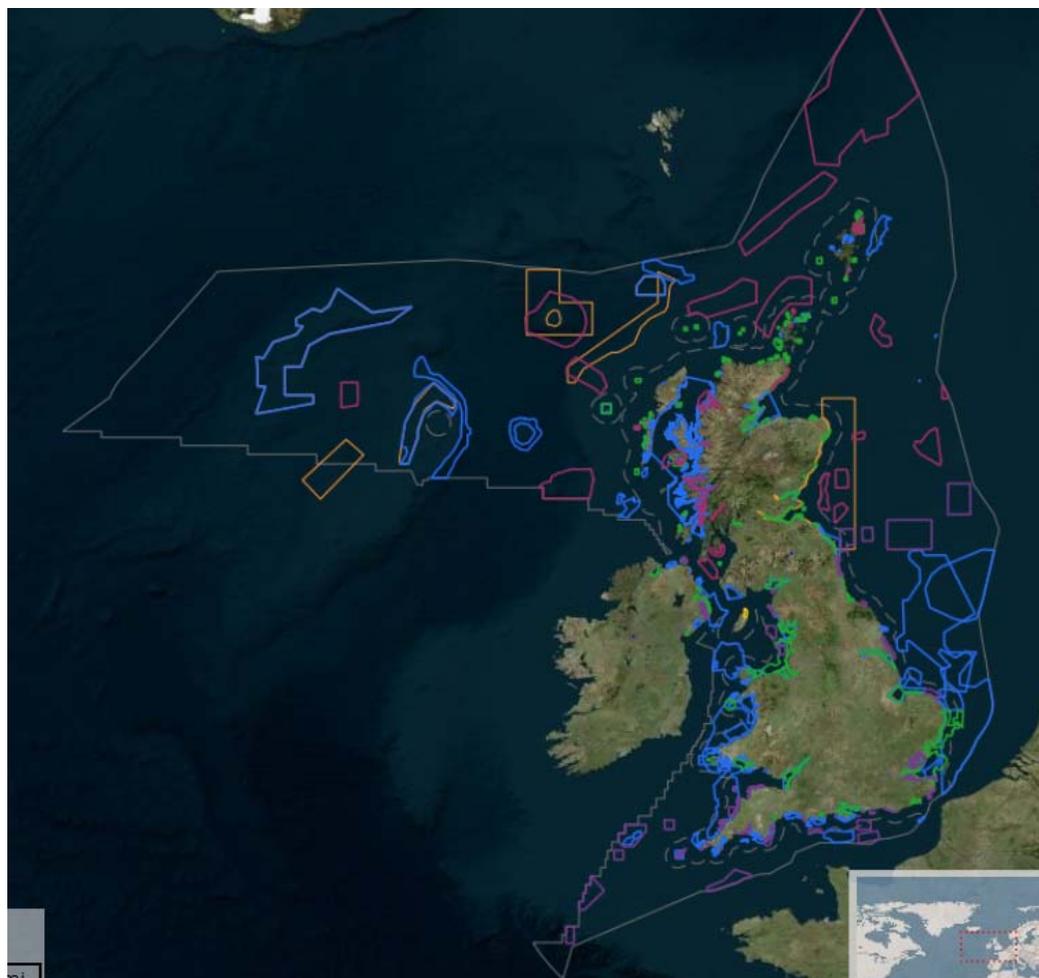
- Key features
  - No chain scouring the seabed
  - Elastic 'rode' link
  - Benefits to the environment

*but*

- Behave differently physically
- Insurance position was unclear
- Costs were unclear
- Deployment proposed in areas without traditional moorings, so not a simple replacement



# Marine Protected Areas in the UK



- SACs with Marine Components
- SACs with marine components
-  SACs with Marine Components

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- SPAs with Marine Components
- SPAs with Marine Components
-  SPAs with Marine Components

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- Marine Conservation Zones
- Marine Conservation Zones
-  Marine Conservation Zones

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- Nature Conservation MPAs & Other Area Based Measures
- Nature Conservation Marine Protected Areas
-  Nature Conservation Marine Protected Areas
- Other Area Based Measures (Scotland)
-  Other Area Based Measures (Scotland)

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- Marine Nature Reserves
- Marine Nature Reserves
-  Marine Nature Reserves

Source: <http://jncc.defra.gov.uk/page-5201&LAYERS=UKCS,MCZ>

# Study methodology

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Task 1a: Literature review; Task 1b: Consultation, focused on:

- Suitability of eco-moorings
- Cost of eco-moorings
- Insurance arrangements for eco-moorings
  
- Consultation covered three groups (and 23 organisations):
  - Marine managers / conservation authorities
  - Eco-mooring manufacturers
  - Insurance providers

Task 2: Analysis of funding options / “Realistic options” for funding the installation and maintenance of eco-moorings

- the organisations and groups with potential roles in eco-mooring deployment were identified and characterised descriptively
- options were specified taking account of descriptive factors (‘dimensions’) such as the short and long term and criteria specified for their assessment.
- this work initially centred on a drafted options matrix derived from the consultation exercise.

# Eco-mooring experiences: global vs. UK history

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## Worldwide:

- Developed in United States and Australian markets over 35 years ago
- Recent installation of 320 eco-moorings in Queensland, Australia
- Regulation a primary driver for introduction with explicit bans on traditional moorings
- No formal industry standards

## UK:

- The UK trials conducted to date are mainly for between one and three eco-moorings at each site
- Concern with differences in tidal range compared with sites overseas

# Evidence Base: Case Studies 1

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- Lundy Island
  - Ongoing installation since 2004
  - Three Seaflex eco-moorings, in 14m of water
  - Tidal range of 9m
  - Previous eco-mooring trial failed after three years due to lack of maintenance
- Mylor Harbour, Cornwall
  - Installed in 2005, single season
  - Single Seaflex mooring, in <2m of water
  - Tidal range of ~6m

## Evidence Base: Case Studies 2

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- Studland Bay, Dorset
  - Eco-moorings as VNAZ, 2009-2011
  - Six moorings, comprising helix screw and Seaflex rodes as marker buoys, in 3m of water
  - Tidal range of 6m
- Salcombe Harbour, Devon
  - Ongoing installation since 2014
  - Single mooring, bespoke design by Plymouth Marine Laboratory / Community Seagrass
  - Mooring comprised fishing floats attached to existing riser chain

## Evidence Base: Case Studies 3

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- South Devon AONB
  - Investigation into use of Hazelett eco-mooring system
  - Several issues (inc. tidal height, water depth, restricted vessel size) meant system was never implemented
- Supplementary information gathered from:
  - Helford River, Cornwall
  - Isle of Man
  - Torbay, Devon
  - Cawsand, Cornwall

# Eco-mooring cost comparison with traditional moorings

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- The costs of traditional and eco-moorings were compared using a *bottom-up cost model* developed for this study.
- Cost components can vary widely due to local features, such as levels of spare capacity in mooring services, so it was necessary to investigate the possible sources of variations and their knock-on impact on overall costs to avoid misleading comparisons.
- The result of the modelling is that the costs for an eco-mooring are very broadly estimated to be *higher than a traditional mooring* when compared on the basis of their annual average costs including components and the installation and maintenance procedures required.

# Eco-mooring cost comparison with traditional moorings



Table 3.7 Alternative scenarios for annual average costs for traditional and eco-moorings

	Annual average cost (£)		% difference
	Traditional mooring	Eco-mooring	
Illustrative example - baseline	788	1,550	+97%
Scenario A – six rather than four moorings	888	1,422	+79%
Scenario B – 20 moorings and 15 minute processing time for each dive operation (compared to 1hr in the baseline)	530	521	-2%

Headline : + 97%

Table 3.6 Illustrative example: Site and operational parameters

Parameter	Value
Number of moorings	4
Return travel to site for RIB	1.5 hrs
Return travel time to site for barge	2.5 hrs
Removal or reattachment of eco-mooring from anchor block using divers	1 hr / mooring / dive team
Onshore maintenance of eco-mooring (rode)	0.5 hrs / mooring / staff
Winch traditional mooring up, replace components and <u>relower</u>	1 hr / mooring / barge

## Availability and cost of insurance

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- While eco-moorings themselves may not be costly, the high value of vessels using them and the potential level of damage from mooring failure means that even low probabilities of failure may lead to high aggregate levels of claims which may also have high variability.
  - The consultees confirmed that the insurance industry is aware of eco-moorings, but that their clients may be only generally insured for them.
  - In particular, eco-mooring trials in most cases have not put insurance arrangements into place and eco-moorings have been used at boaters' own risk.
  - To date, the insurance details do not distinguish between traditional and eco-moorings, as reported above. Instead, insurance policies mainly reflect mooring characteristics (e.g. swing, fixed, pontoon, trot or drying) and the location of the mooring; seasonal restrictions may also be included in a policy.
  - Eco-moorings would fall under the definition of a swing-mooring and hence potentially be insured under an existing policy.
  - insurers would consider that new use of eco-moorings is a 'material change' which they would expect their client to inform them of.
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# Eco-mooring funding options (Primarily structural, not cost-based)

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## Option 1 - “Laissez faire”

- Ad-hoc and voluntary groups (+Community Seagrass initiative, RYA?)
- Insurance through ‘use at your own risk signage’
- No necessary match between the level of need and capacity of ad-hoc groups

## Option 2 – Centralised Services

- A ‘hard’ programme (statutory requirement) leads to fast roll-out & benefits of e.g. batch purchase
- A ‘soft’ programme leads to slow roll-out & benefits of e.g. an information system
- Best government role?

## Option 3 – Long term Infrastructure

- Key programmes for any robust infrastructure are inspection, maintenance and capital replacement
- State ownership gives lowest cost of provision for society?
- Who would bid for eco-moorings if first established by government and then auctioned off?

## Comment

- Fundamental change in patterns of risk, especially for anchoring
- Very simple engineering but deployment tied up in institutional, financial and and practical issues
- Requires the coordination of a range of activities from scientific knowledge to purchase of local services, the allocation of responsibilities and liabilities to agents and the need for long term, ultimately perpetual, programs

# Funding options: Who should fund eco-moorings?

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- Requirement and opportunity:
  - How many moorings are required?
  - Manufacturer or advertiser contributions?
  - Potentially the only way to access a particular environment (if anchoring is banned) and so could potentially command a 'gate fee' above the costs of their provision and generate licensing revenues
- Risk and uncertainties:
  - Costs can be approximately double traditional moorings
  - The main technical and financial risk is the need for customisation
  - No established insurance market
  - Revenue collection system expensive
  - Difficult to police use (no register of boaters)

# Study recommendations

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- **Eco-moorings continue to be understood as a potential management measure for MPAs.**
  - Eco-mooring technology could provide three types of MPA management measure: an alternative to anchoring in voluntary no anchoring zones (VNAZ); as markers for obligatory no anchoring zones (NAZ), and as replacements for traditional moorings in areas adjacent to or within sensitive habitats.
- **Future trials are recommended which take a holistic set of factors into account and not just the ecological need for the moorings.**
  - Many conservation initiative groups and local authorities such as the Hampshire and Isle of Wight Wildlife Trust and Lundy Trust are already seeking funding independent of government plans, such as the Heritage Lottery fund, to instigate eco-mooring systems and these are a potential starting point for trials.
- **‘Whole life’ eco-mooring costs should be estimated for selected MPAs to provide a better basis for assessing variation across the UK.**
  - MPAs which do not have existing mooring provision are those for which cost estimates are the most instructive. A particular focus on solutions with minimum overheads should be included and should include consideration of costs of services that might be effectively provided nationally.

# Future workstream recommendations

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- **It is recommended to consider the topics in a more quantitative fashion than was possible here due to resource constraints. Furthermore, in future research work a particular focus should be placed on:**
  - Eco-mooring best practice in general terms, potentially including indicative costs;
  - Development of standards for UK conditions; and
  - Information management - consultees highlighted the need for better information. Evidence was not always collected in trials to date which has already led to misinformation identified in this study.