Ecological coherence of the Celtic Seas MPA network

Olivia Langmead[1,2], Nicola Foster[1], Sian Rees[1] & Charly Griffiths[2]

[1]Plymouth University Marine Institute

[2]Marine Biological Association

Ecological coherence of the Celtic Seas MPA network

- The Celtic Seas is one of the four sub-regions with the North East Atlantic regional sea (MSFD)

- It comprises:
  - the full EEZ of the Republic of Ireland
  - Parts of the French and UK EEZs

- Member States are required to develop coherent and coordinated marine strategies in each marine region /sub-region to achieve GES

- This includes spatial protection measures, contributing to coherent and representative networks of MPAs (Art. 13(4))
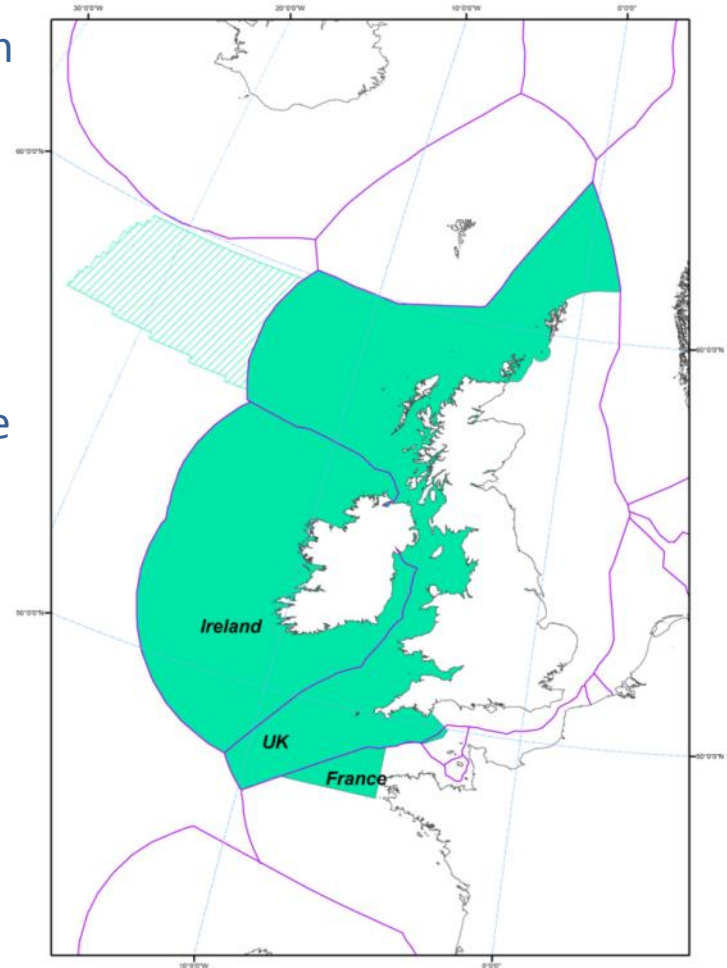
Ecological coherence of the Celtic Seas MPA network

An ecologically coherent network of MPAs:

- Interacts and supports the wider environment (OSPAR 2006)

- Maintains the processes, functions and structures of the intended protected features across their natural range (Laffoley et al. 2006)

- Functions synergistically as a whole, such that the individual protected sites benefit from each other to achieve the above two objectives (OSPAR, 2006)

• In addition, there is a CBD goal of 10% of coastal and marine areas protected (Aichi Target 11)

© Mark Smith

Ecological coherence of the Celtic Seas MPA network

Aims:

- To assess the ecological coherence of the Celtic Seas MPA network

- To consider 'other' spatial measures and their role in meeting spatial and network targets

© Sarah Miles

Ecological coherence of the Celtic Seas MPA network
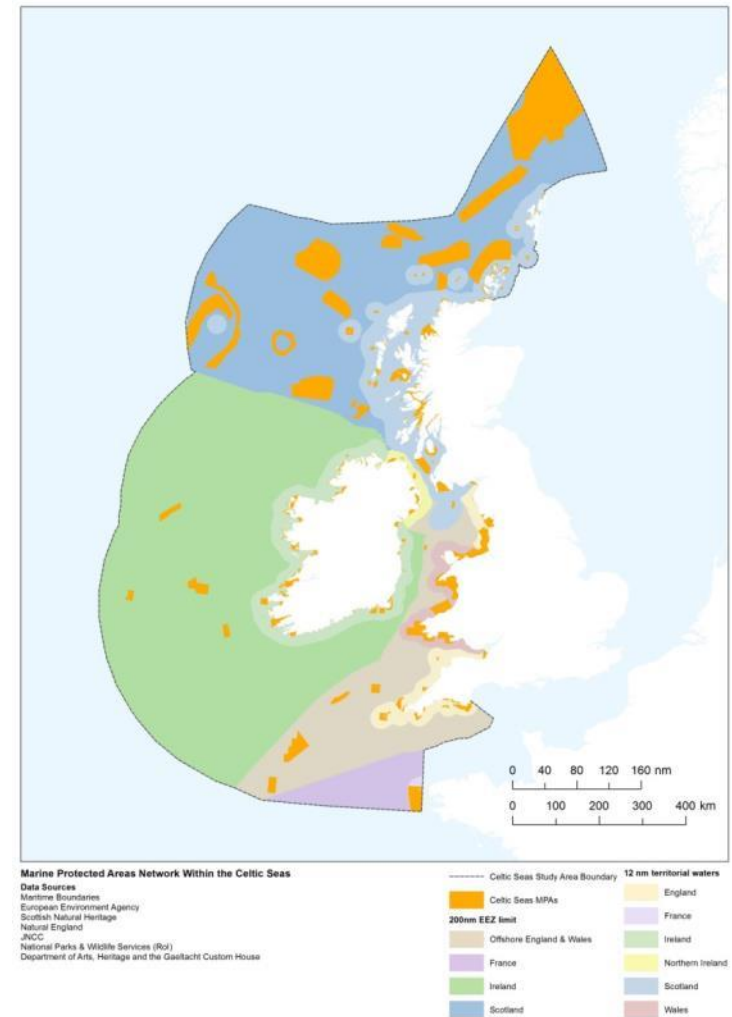
Approach

- MPAs considered in the network
  - International (RAMSAR sites)
  - European Marine Sites (SACs, SPAs)
  - National
    - England/Wales (MCZs)
    - Scotland (Nature Conservation MPAs)
    - UK (GB SSSI/ NI ASSI)
    - Isle of Man (MNR)
    - France (Parcs Naturels Marins)

© Mike Pallett

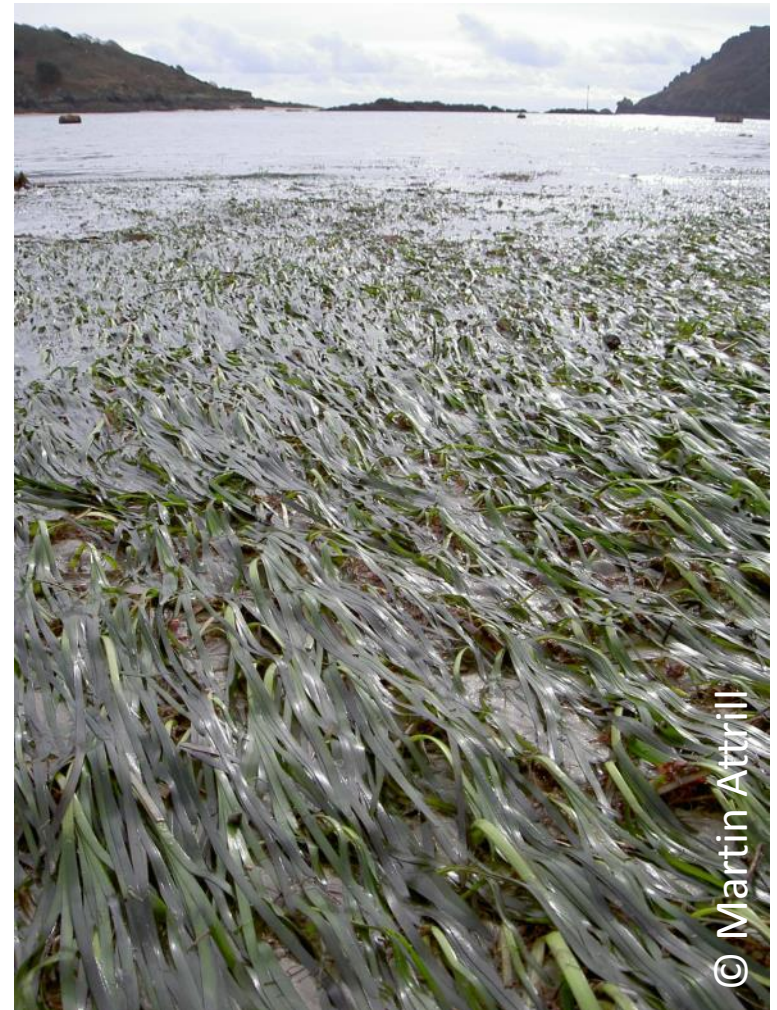# Ecological coherence of the Celtic Seas MPA network

Approach

- **Data gathering**
  - Species & habitats (MB0102, DASSH, MarLIN, NBN)
  - Broadscale habitats (UKSeaMap, EUSeaMap)

- **Data processing**
  - Overlapping MPAs – merged to prevent double counting (533 designations -> 274 MPAs)
  - Boundaries clipped to MSFD area (i.e. MHWM, transitional waters removed)
  - Conversion of all habitats types to EUNIS

Marine Protected Areas Network Within the Celtic Seas
Data Sources
Maritime Boundaries
European Environment Agency
Scottish Natural Heritage
Natural England
JNCC
National Parks & Wildlife Services (RoI)
Department of Arts, Heritage and the Gaeltacht Custom House

Ecological coherence of the Celtic Seas MPA network

Approach

- Representativity
  - Geographic (political boundaries)
  - Biogeographic
  - Bathymetric
- Replication
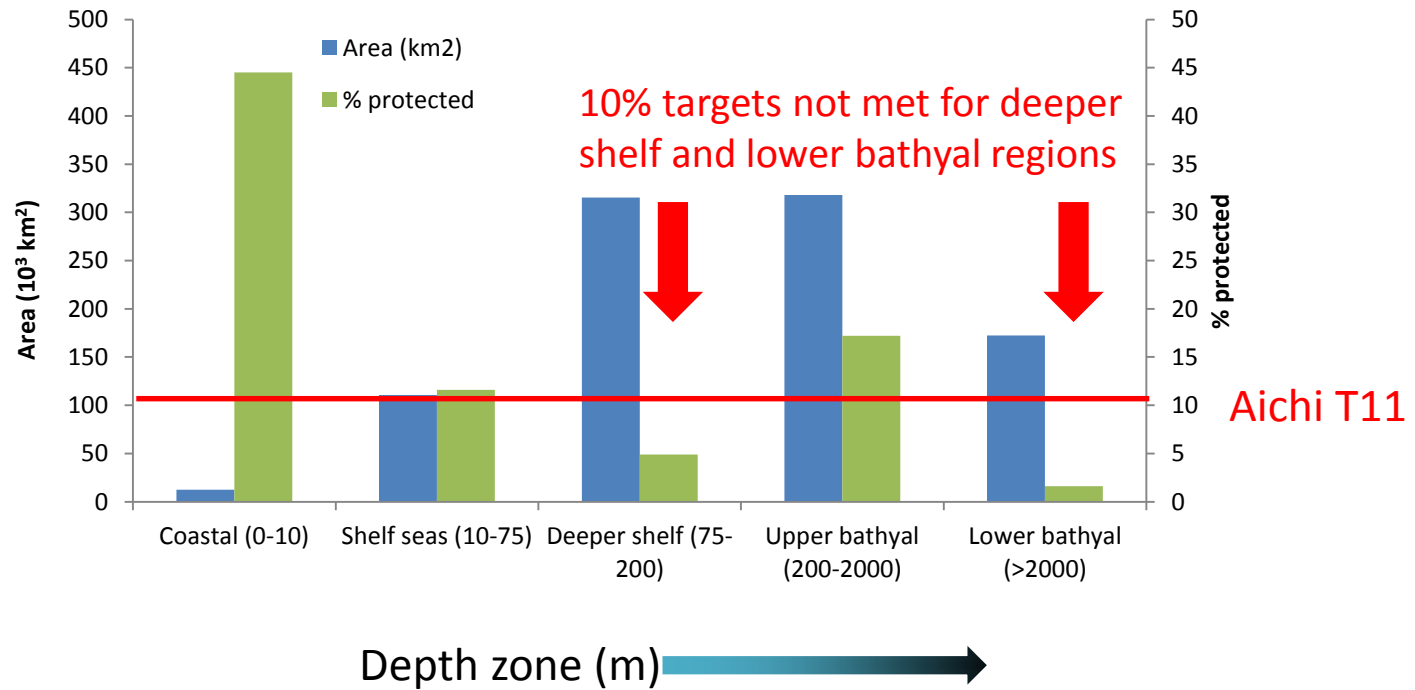- Adequacy
- Viability
- Connectivity (proxy)

© Martin Attrill

Ecological coherence of the Celtic Seas MPA network

Geographic representativity

Region	# designated MPAs / # merged sites	Area km² within Celtic Seas	Area km² (%) of waters within Celtic Seas MPA network		Aichi Target 11 achieved (10%)
Ireland	143 / 92	413,813	6,084	(2%)	
France	3 / 1	28,410	1,703	(6%)	
UK	387 / 181	449,659	83,702	(18.6%)	
England & Wales	161 / 65	128,993	11,754	(9%)	
Scotland	182 / 95	310,802	71,264	(23%)	
Northern Ireland	43 / 20	5,242	589	(11%)	
Isle of Man	1 / 1	4,622	95	(2%)	
Total	**533 / 274**	**924,756**	**91489**	**(10%)**	

Ecological coherence of the Celtic Seas MPA network

Bathymetric representativity

10% targets not met for deeper shelf and lower bathyal regions

Aichi T11

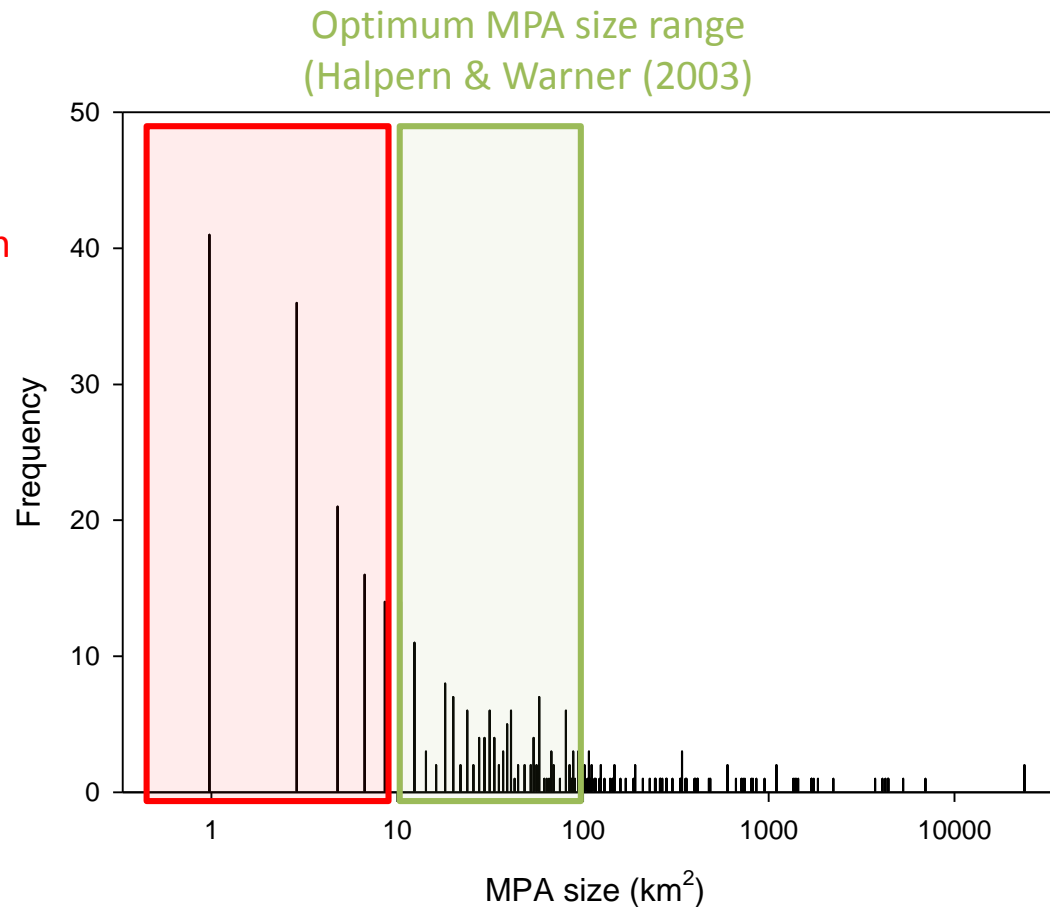# Ecological coherence of the Celtic Seas MPA network

Replication and adequacy of MSFD Predominant Habitats
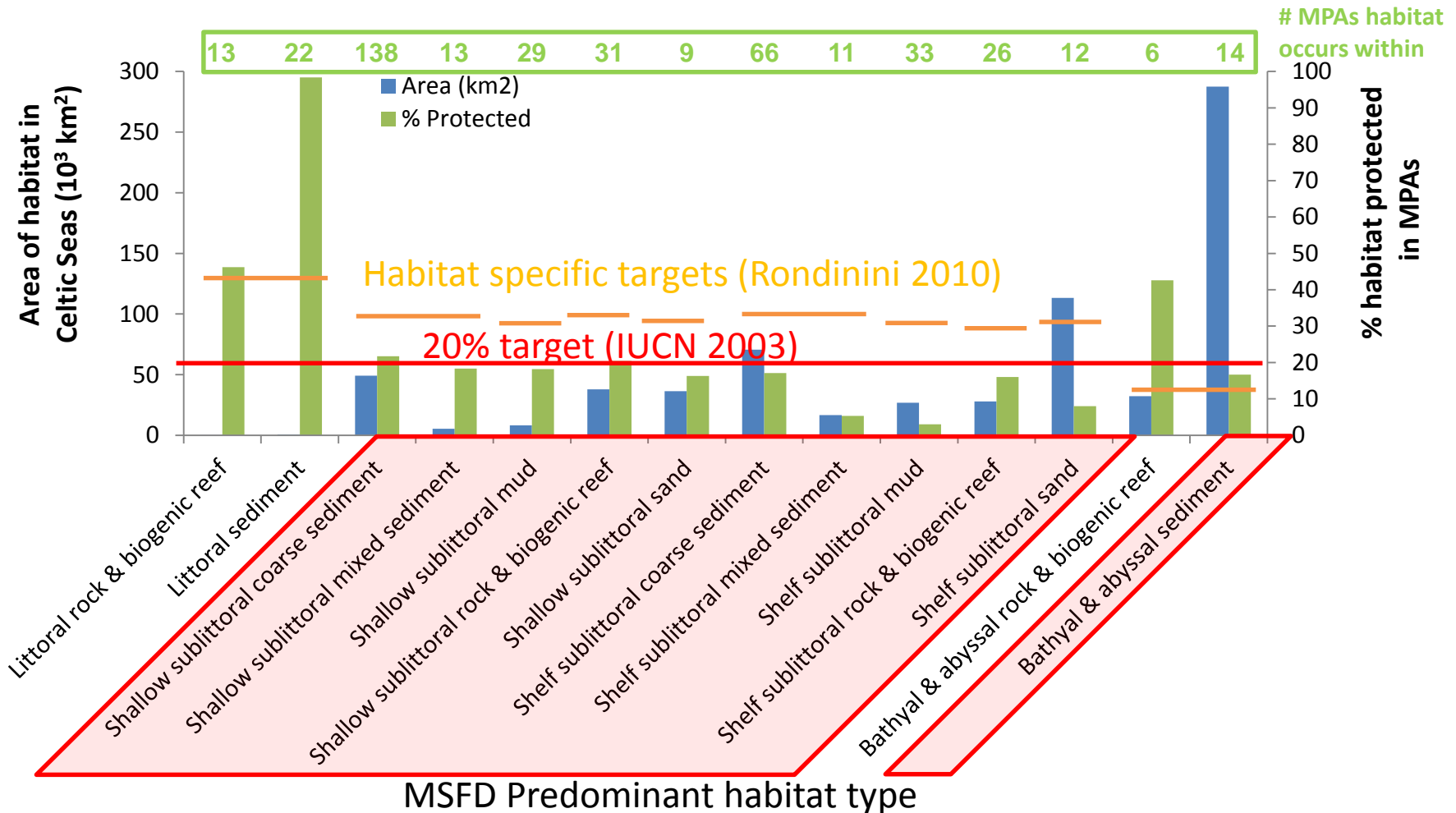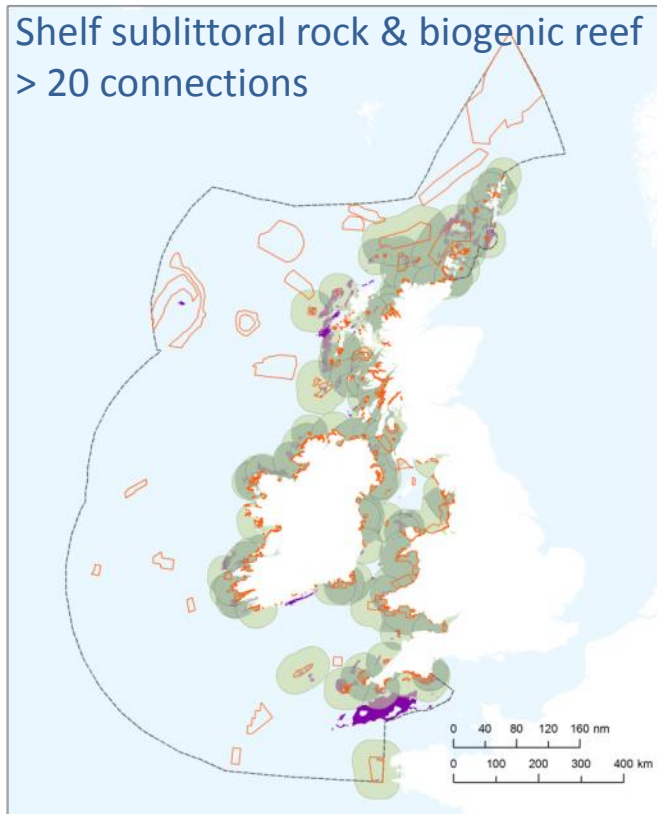
Ecological coherence of the Celtic Seas MPA network

Viability

39.2% of MPAs are smaller than the threshold size of 10 km^2 (133 sites)

Optimum MPA size range (Halpern & Warner (2003)

Ecological coherence of the Celtic Seas MPA network

Connectivity

Shelf sublittoral rock & biogenic reef
> 20 connections

Shelf sublittoral mixed sediment
2 connections

Ecological coherence of the Celtic Seas MPA network

Other spatial measures

Article 13(4) of the MSFD: Member States need to include into their programmes of measures '*spatial protection measures, contributing to coherent and representative networks of marine protected areas, adequately covering the diversity of the constituent ecosystems*'.

This has been interpreted by EEA as
- Non-statutory designations (e.g. voluntary marine conservation areas)
- Areas protected by sectoral interests (e.g. permanent fisheries closures)
- Private reserves

In addition, CBD strategic plan 2011-2020 identifies that '*other effective area based conservation measures*' can contribute to achieving area targets, such as Aichi Target 11 (10% of coastal and marine area protected by 2020).

© MBA

Wembury VMCA

Closed areas (all gear/demersal towed gear). Source Marine Scotland

Ecological coherence of the Celtic Seas MPA network

Aim: What additional sites afford biodiversity protection in the Celtic Seas region and how much do they add to the existing MPA network?

Approach

- Criteria for consideration
    1. The area must have defined boundaries;
    2. There must be measures in place to restrict certain activities (either statutory or voluntary);
    3. Site must comprise sea or coastal waters within the Celtic Seas MSFD region;
    4. There must be permanent (year round) restrictions; and
    5. There must have likely benefit for biodiversity conservation.

- Data gathering exercise

- Scale of benefits and confidence in evidence defined

Scale of benefit	Definition
Significant	Quantifiable positive benefit
Low	Some level of benefit, benefit in some cases or to certain taxa
Negligible	No probable benefit
Unknown	Insufficient information available to assign benefit category

Confidence	Definition
High	UK-related, peer-reviewed literature
Moderate	Grey or overseas literature
Low	Expert opinion

Ecological coherence of the Celtic Seas MPA network

Types of sites included in analysis:

- Fisheries closures (permanent, all gear and demersal towed gears)
- Protected wrecks (Protection of Wrecks Act 1973 S1 &2, Scheduled ancient monuments & military remains)
- Offshore renewable installations
- Voluntary marine conservation areas (VMCAs)

Types of site removed from analysis:

- All other types of fisheries closures (temporal, vessel size, target species)
- Shipping areas (Special Areas, Particularly Sensitive Sea Areas, Marine Environmental High Risk Areas)
- Oil and gas installation safety zones, and power station safety zones
- Decommissioned ammunition dump sites & active artillery ranges
- Ports and harbours
- Submarine cables
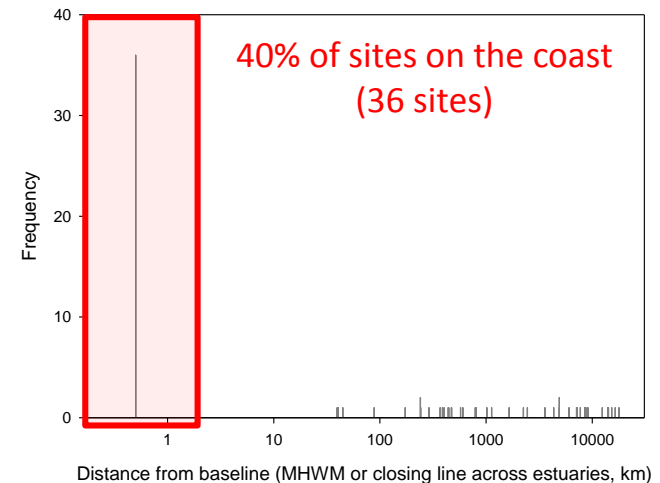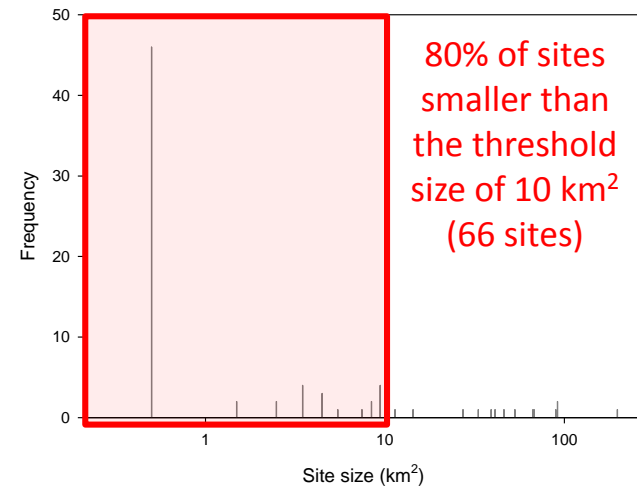- Burials at sea sites

© ceh

Ecological coherence of the Celtic Seas MPA network

83 sites fulfilled criteria:

- 44 cultural sites

- 21 renewables installations

- 21 fisheries closures

- 5 voluntary marine conservation areas

When mapped against the Celtic Seas MPA network:

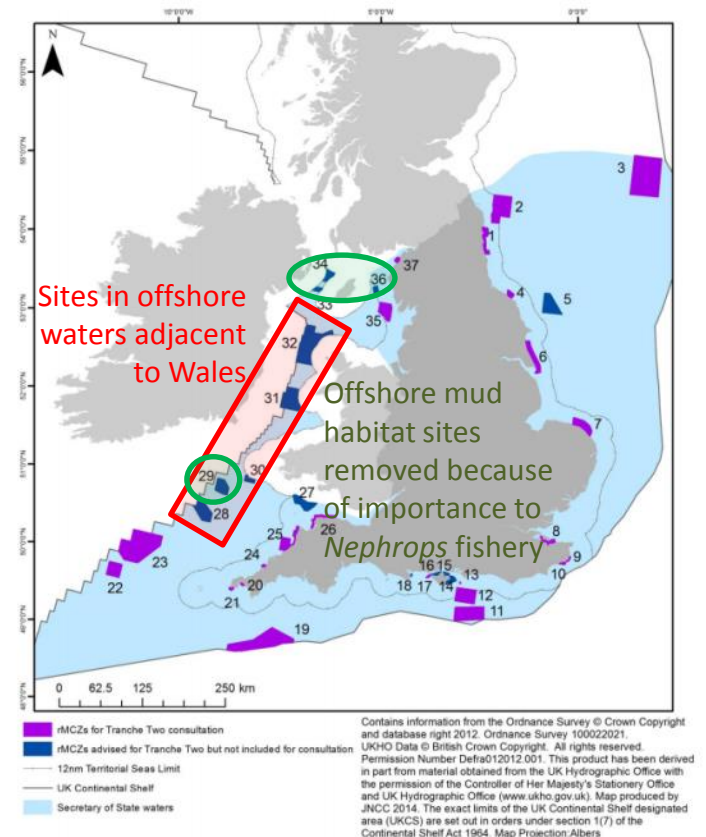- 33 fell within the network (all VMCAs)

- 6 partially overlapped

- 44 fell outside the network

- Sites are generally very small (median 0.29 km^2)

- Sites are mostly coastal

80% of sites smaller than the threshold size of 10 km^2 (66 sites)

Frequency vs Site size (km^2)

40% of sites on the coast (36 sites)

Frequency vs Distance from baseline (MHWM or closing line across estuaries, km)

Ecological coherence of the Celtic Seas MPA network

Conclusions

- This is the first assessment of an MPA network at MSFD subregional scale

- The network does not meet all targets for ecological coherence

  - Representativity and replication targets met

  - Adequacy and viability targets not met

  - Additional designations needed in offshore and deeper habitats – significant gaps

  - There are political and economic barriers to offshore designation in UK waters e.g. devolution of Welsh offshore area, removal of offshore MCZs protecting mud habitat from consideration due to perceived impacts on NI *Nephrops* fisheries

  - Inclusion of other spatial measures does not fill the gaps offshore and or MPA size (viability) but may have value for individual habitats

Sites in offshore waters adjacent to Wales

Offshore mud habitat sites removed because of importance to *Nephrops* fishery

Ecological coherence of the Celtic Seas MPA network

Key challenges identified:

- Differences in MS progress towards MPA designation (Ireland lagging behind)

- Need to better coordinate MPA designation at EU level to achieve ecological coherence for large transboundary offshore areas

- Management not considered (assumption that protected features are actually protected) – there is a need to establish protocols for assessing management effectiveness across MS

- Limited data to conduct this type of assessment

- Need for agreement on what types of other spatial measures can contribute to area targets

©Mark Smith

Report available from:
http://assets.wwf.org.uk/downloads/wwf_celtic_seas_a4_report_v4.pdf

Ecological coherence of the Celtic Seas MPA network

Forthcoming publications:

Foster et al. (submitted) Ecological Coherence of an MPA network in the Celtic Seas: An MSFD subregion case study

Langmead et al. (in prep) 'Other' spatial measures: characterisation and role in supporting MPA network targets

Rees et al. (2016) Defining the qualitative elements of Aichi Biodiversity Target 11 with regard to the marine and coastal environment. A report to the Convention on Biological Diversity expert group.

© Nova Mieszkowska

CELTIC SEAS PARTNERSHIP

WWF