# PART 3 SELECTION ASSESSMENT DOCUMENTS

## 3.1 Selection Assessment Documents for recommended MCZs

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 1 MUD HOLE

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 1 Mud Hole (zone includes a recommended reference area A.)

## 2. Site centre location

rMCZ 1:
54° 18' 59.230" N, 3° 50' 55.815" W
54.316453 Lat, -3.848837 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA A:
54° 20' 32.101" N, 3° 52' 34.138" W
54.34225 Lat, -3.876149 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

72.65 $Km^2$ (7264.8 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

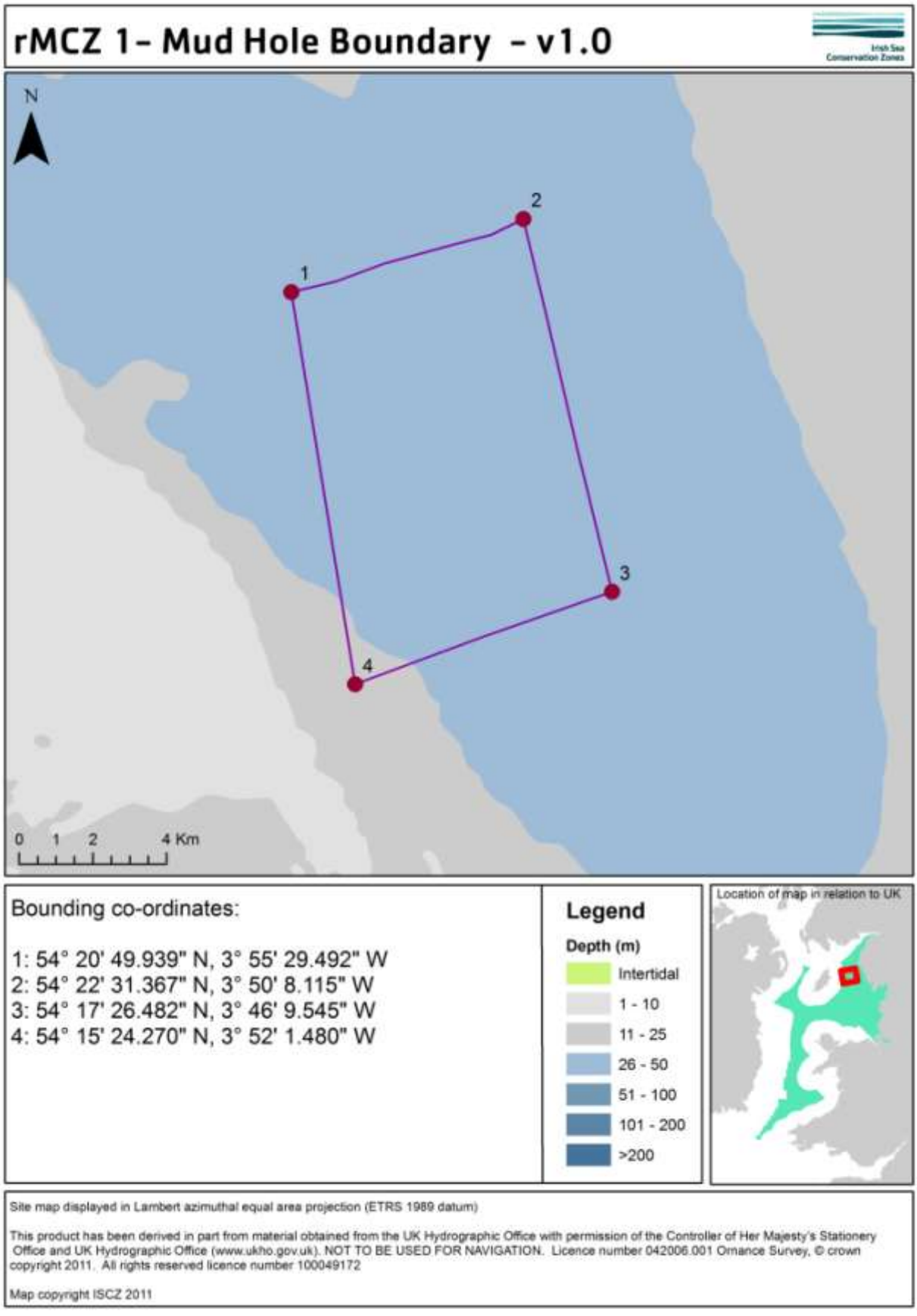
## 5. Features proposed for designation within rMCZ1

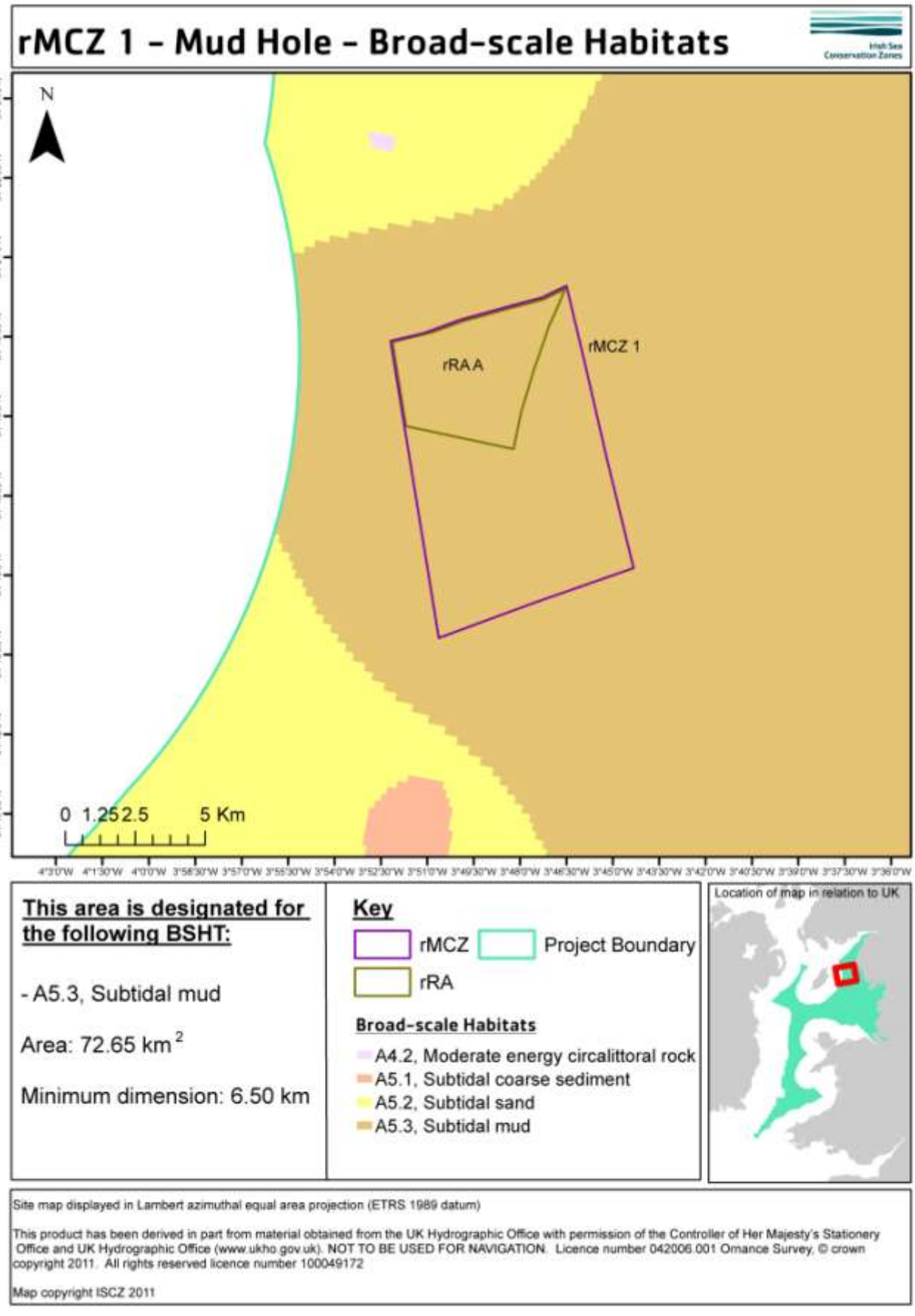
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A5.3 Subtidal mud | 72.65 $Km^2$ (7264.48 Ha) |
| Habitat of conservation importance | Mud habitats in deep water<br>Sea-pens and burrowing megafauna | 34.80 $Km^2$ (3480.28 Ha)<br>33.80 $Km^2$ (3480.28 Ha) |
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | n/a | |

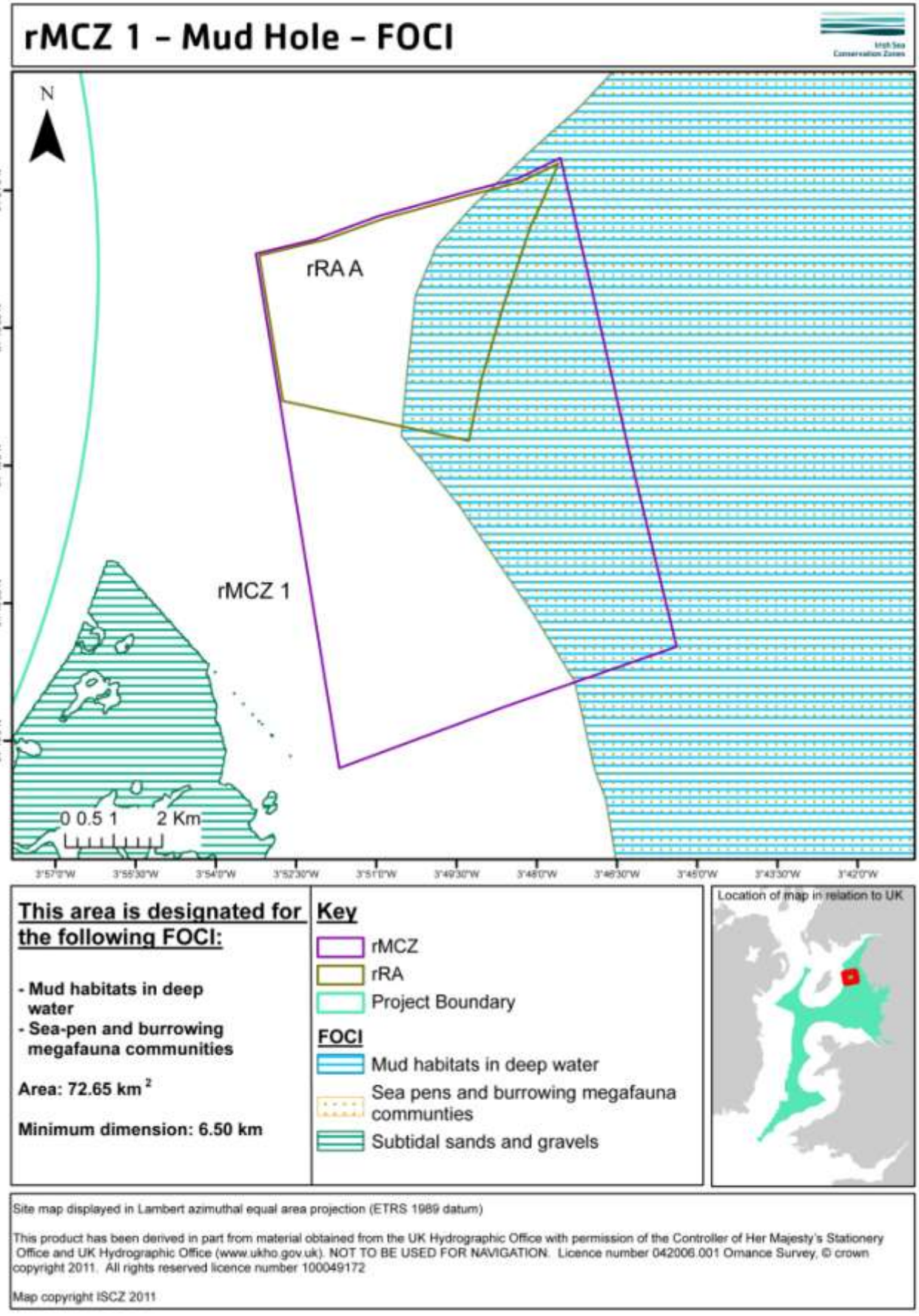
## 6. Features within rMCZ1 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Maps of site




rMCZ 1 – Mud Hole – Broad-scale Habitats
Irish Sea Conservation Zones
N
rMCZ 1
rRAA
0 1.252.5 5 Km
4°3'0"W 4°1'30"W 4°0'0"W 3°58'30"W 3°57'0"W 3°55'30"W 3°54'0"W 3°52'30"W 3°51'0"W 3°49'30"W 3°48'0"W 3°46'30"W 3°45'0"W 3°43'30"W 3°42'0"W 3°40'30"W 3°39'0"W 3°37'30"W 3°36'0"W
This area is designated for the following BSHT:
- A5.3, Subtidal mud
Area: 72.65 km 2
Minimum dimension: 6.50 km
Key
rMCZ
Project Boundary
rRA
Broad-scale Habitats
A4.2, Moderate energy circalittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.3, Subtidal mud
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Omance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011




Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

rMCZ 1 consists of an area of deep water (26-38 m) mud habitat located 21 km (10 nm) off the Cumbrian coast in northwest England. This area of subtidal mud contains the following FOCI habitat types: mud in deep water and sea-pens and burrowing megafauna. These muddy habitats form part of the eastern Irish Sea mud patch, an area that is geographically isolated from the deep water mud habitat that is present in the western Irish Sea (Clements 2010). The mud is of high commercial interest, as it is the habitat of the Dublin Bay prawn *Nephrops norvegicus*. There are, however, a number of other species which inhabit this seabed type, including the brittlestar *Amphiura chiajei* and the burrowing sea urchin *Brissopsis lyrifera*. Lumb et al. (2011) mapped the expected distribution of sea-pens and burrowing megafauna within this part of the Irish Sea. The expected distribution was inferred from survey data and from the presence of the suitable underlying habitat type (Hughes and Atkinson 1997). Historically, sea-pens were abundant in this region (Jones et al. 1952 cited in Swift 1993), but relatively recent video survey data indicated that they have become rare in this part of the eastern Irish Sea (Hughes and Atkinson 1997). Designation of rMCZ 1 may allow for the potential recovery of sea-pens and burrowing megafauna, a habitat type which is known to be vulnerable to otter trawl impacts (Hinz et al. 2009).

## 9. Detailed site description

rMCZ1 is being recommended for designation for the presence of the broad-scale habitat type subtidal mud and two characteristic sub-habitat features, mud habitats in deep water and sea-pens and burrowing megafauna.

rMCZ 1 is located on the edge of a wider area of subtidal mud in the eastern Irish Sea. The habitat has been mapped from a combination of both physical and biological data (UK Seamap, the Mapping European Seabed Habitat projects (MESH). This area is subject to moderate energy wave and tidal energy (UK SeaMap, 2010) and, as such, is a relatively stable, depositional environment.

To the south of rMCZ1, the biological community has been surveyed. From video surveys it appears that the inshore the muddy sand community is characterised by a high abundance of bivalves *Kurtiella bidentata* and brittle stars *Amphiura filiformis*, whilst the burrows present were characteristic of the burrowing mud shrimp *Callianassa subterranean* (Walney and Ormonde 2009, 2010, & Lumb et al. 2011). In contrast, offshore (where rMCZ1 is located) the predominant bivalves present were *Mysella bidentata* and *Abra nitida* which are suspension and detritus feeders, respectively. Due to the low light levels no plants tend to grow at this depth. This means that the marine invertebrates, found within the seabed are a key part of the food chain, linking energy from the plankton to higher trophic levels, such as predatory fish (Bolam et al. 2010).

There is survey data to verify the presence of the habitat features sea-pens and burrowing megafauna within this wider area of subtidal mud. Lumb et al. (2011) reviewed previous survey data for the presence of this habitat type and mapped the expected distribution of sea-pens and burrowing megafauna, including the area of rMCZ1. It is important to note that the presence of sea-pens and burrowing megafauna within the current boundaries of rMCZ1 is *not* confirmed from direct biological sampling, but inferred from their presence in the surveyed mud to the south.

The most well known burrowing marine invertebrate that makes up the sea-pen and burrowing megafauna habitat (and is also found in deep water mud habitats) is the Dublin Bay prawn *Nephrops norvegicus*. This habitat corresponds with valuable commercial fishing grounds in this part of the project area. The eastern

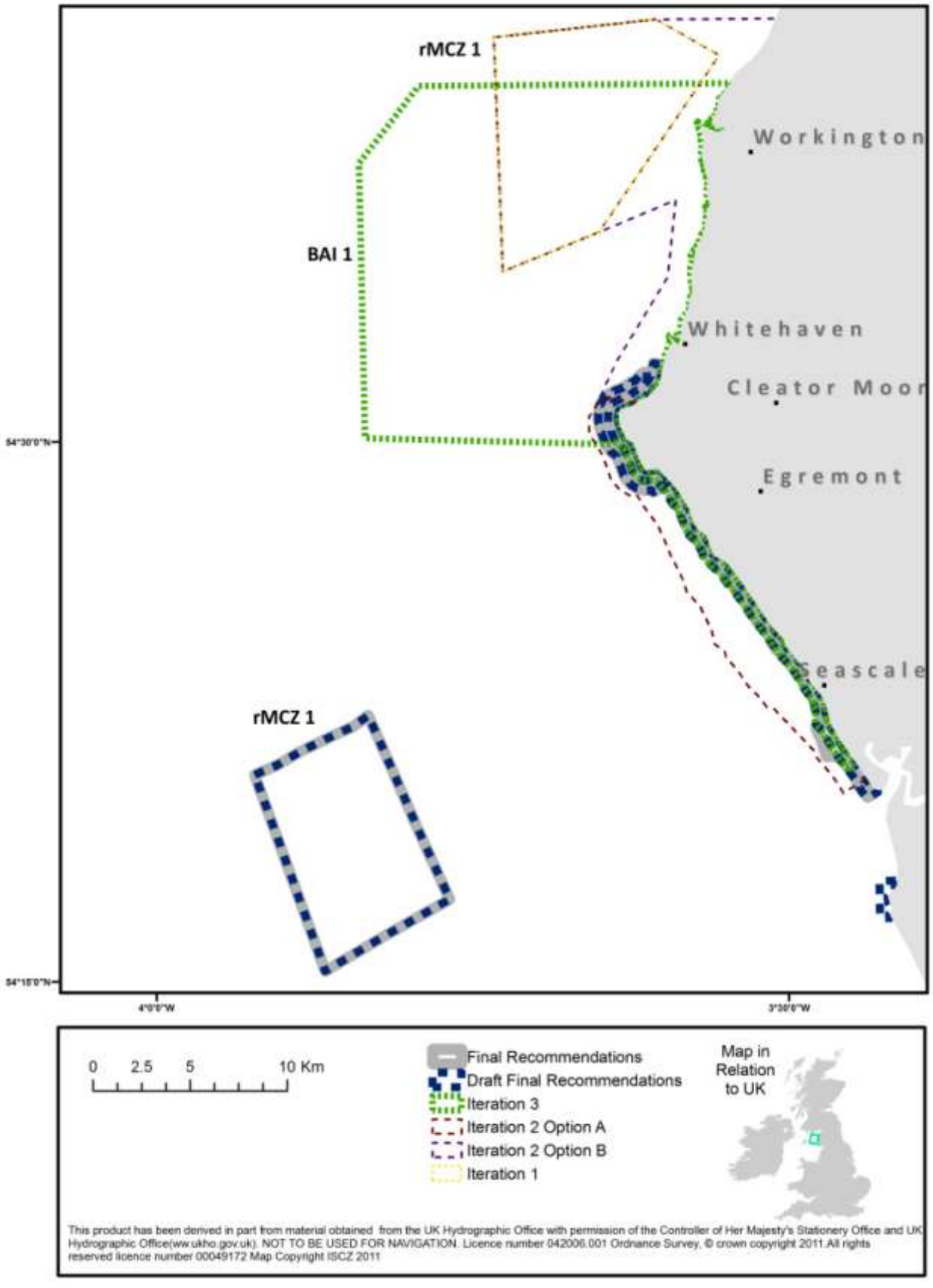
Irish Sea *Nephrops* population is known to be smaller than the population in the western Irish Sea, which occurs on a geographically separate mud patch. The two populations are not thought to be connected larvally. (Clements 2010). There are, however, a suite of other animals which inhabit deep water mud habitats including the brittlestar *Amphiura chiajei* and the burrowing sea urchin *Brissopsis lyrifera.*

These burrowing animals (including *Nephrops*) provide an important ecological function termed bioturbation which refers to the disturbance and mixing of sediments by organisms especially by burrowing, boring or ingestion. The activities of these animals, which can take many varied and species-specific forms, leads to the disturbance of sediments on the seafloor. For example, suspension feeders such as the burrowing mud shrimp *Callianassa subterranean* ingest the particles present within the sea water that they draw into their burrows and the excreted material acts as a cement to form the rigid structure of their burrow tubes; this provides stability to the sediment substrate (Kogure and Wada 2005).

## 10. Site boundary

This site was originally proposed at the Cumbrian (Whitehaven) focus group meeting in April 2011. Its boundaries are delineated by DECCA lines that are used for fisheries navigation and, as such, it is designed for ease of management for the commercial fishing industry. Whilst the DECCA system is no longer in operation, it is clear that the fishermen in the ISCZ project area still use the DECCA lines for navigation. Even the most up-to-date GPS (or VMS) equipment is commonly translated to the DECCA system. The site captures a substantial proportion of subtidal mud and two mud-related FOCI. This area was accepted by the RSG at their May 9$^{th}$ and 10$^{th}$ meeting and has not changed since the draft final recommendations. In previous iterations, the site was a much larger Broad Area of Interest, where both conservation and commercial fishing sectors were never satisfied with its location. The development of the site boundary through time is shown on the below map.

# rMCZ 1- Iteration 1- Final Recommendations



## 11. Conservation Objectives

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mud** to favourable condition by 2020 and maintain thereafter, such that: |
| 2 Attributes and parameters | The habitat<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of the **Subtidal Mud** in the biogeographic region are all **recovered,** such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3 Pressures | **Subtidal Mud** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• *Physical loss (to land or freshwater habitat)*<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change, **recover** the **Mud Habitats in Deep Water** to favourable condition by 2020 and maintain thereafter, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Mud Habitats in Deep Water** in the biogeographic region are all **recovered,** such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3 Pressures | **Mud Habitats in Deep Water** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change, **recover** the **Sea-pens and Burrowing Mega Fauna Communities** to favourable condition by 2020 and maintain thereafter, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Sea-pens and Burrowing Mega Fauna Communities** in the biogeographic region are all **recovered,** such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3 Pressures | **Sea-pens and Burrowing Mega Fauna Communities** are sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed <25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Organic enrichment*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Salinity changes - local*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration >25mm*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling and other fisheries. |

## 12. Sites to which this site is related

The distance between rMCZ1 and other MCZs which are being recommended for the designation of the same EUNIS level 2 habitat types was calculated. rMCZ1 is 15 km (8 nm) north-west of rMCZ2, 55 km (30 nm) north-west of rMCZ8 and 77 km (41 nm) east of rMCZ6. Like rMCZ1, these three other MCZs have been recommended to protect the EUNIS level 2 habitat sublittoral sediment.

rMCZ1 is in the vicinity of the following existing and draft conservation areas that have marine associated features. Vicinity is in this context been defined as a distance less than 80 km. Morecambe Bay (SPA, SSSI), Drigg coast (SAC) and Duddon estuary (SPA / SSSI) are within 40 km of rMCZ1. Within 80 km of this site are: Solway Firth (SAC), Upper Solway flats and marshes (SPA), Luce Bay and Sands (SAC), Ribble and Alt Estuaries (SPA).

## 13. Supporting documentation

This section should include the sources of the best available scientific and stakeholder information used to identify sites and conservation objectives presented in a table format:

| **Information** | **Type of information** | **Source** |
|---|---|---|
| Location of subtidal mud | Combined physical and biological surveying with habitat modelling | MESH |
| Location of mud habitats in deep water | Combined physical and biological surveying with habitat modelling | MESH |
| Location of sea-pens and burrowing megafauna | Inferred distribution based on suitable habitat type, and biological sampling. | Hughes and Atkinson 1997, Lumb et al. 2011, Swift 1993 |

## 14. Stakeholder considerations

***Caveats:***

- Cumbrian fishing interests indicated that this site has emerged from many months of difficult negotiations and made it clear that they would not support any modifications to the site boundaries at a later date.
- The MOD assumed that their activities (firing range) in this site are compatible with the benthic features for which it is being proposed for designation.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder Support:***

Most stakeholders accepted the inclusion of rMCZ1 in the final network, and the boundary of the site attracted little discussion once this offshore site had been identified (it was previously a much larger broad area of interest). Most to all concerns were raised from the commercial fishing sector, due to the likelihood of losing fishing grounds. It became clear, through the stakeholder process, that this site was not the first choice for conservation or commercial fishing interests (the two main sectors with interests in this site), but it was a compromise following months of discussion between various stakeholder interests in order to meet the subtidal mud ENG target.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References


BOLAM, S.G., BARRIO-FROJAN, C.R.S. & EGGLETON, J.D. 2010. *Macrofaunal production along the UK continental shelf*. Journal of Sea Research **64**: 166-179.

CLEMENTS, A.J. 2010. *Broad-scale ecological investigation of Nephrops norvegicus (L.) Burrow distribution in the Western Irish Sea*. Ph.D. Thesis, Queen's University Belfast.

HINZ, H., PRIETO, V. & KAISER, M.J. 2009. *Trawl disturbance on benthic communities and chronic effects and experimental predictions.* Ecological Applications **19** (3) 761-773.

HUGHES, D.J. & ATKINSON, R.J.S. 1997. *Towed video survey of the megafaunal bioturbation in the North Eastern Irish Sea.* Journal of the Marine Biological Association. **77** 635-653.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

LUMB, C., JOHNSTON, M. & BUSSELL, J. 2011. *Evidence on the distribution and quality of mud-related features in the Eastern Irish Sea.* A paper presented to the ISCZ Project Team and Regional Stakeholder Group.

KOGURE, K., AND WADA, M. 2005. *Impacts of macrobenthic bioturbation in marine sediment on bacterial metabolic activity*. Microbes and Environments **20** (4) 191-199.

SWIFT, D.J. 1993. *The macrobenthic infauna off Sellafield (north-eastern Irish Sea) with special reference to bioturbation.* Journal of the Marine Biological Association, **73**, 143-162.

WALNEY & ORMONDE. 2009. *Offshore Windfarm Benthic Survey Reports November 2009 & October 2010.* Work undertaken for Dong Energy/Vattenfall by CMACS

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 2 WEST OF WALNEY

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ2 - West of Walney (including a proposed co-location zone that is not part of the rMCZ2 site)

## 2. Site centre location

rMCZ 2
54° 7' 9.198" N, 3° 31' 39.374" W.
54.119222 Lat , -3.527603 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

Proposed co-location zone (pCLZ)
54° 2' 9.616" N, 3° 33' 3.167" W
54.036004 Lat, -3.550879Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

rMCZ 2
156.37 $km^2$ (15636.31 ha)

pCLZ
232 $km^2$ (23199.79 ha)

Total (rMCZ and pCLZ)
388.37 $km^2$ (38836.1 ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

## 5. Features proposed for designation within rMCZ 2

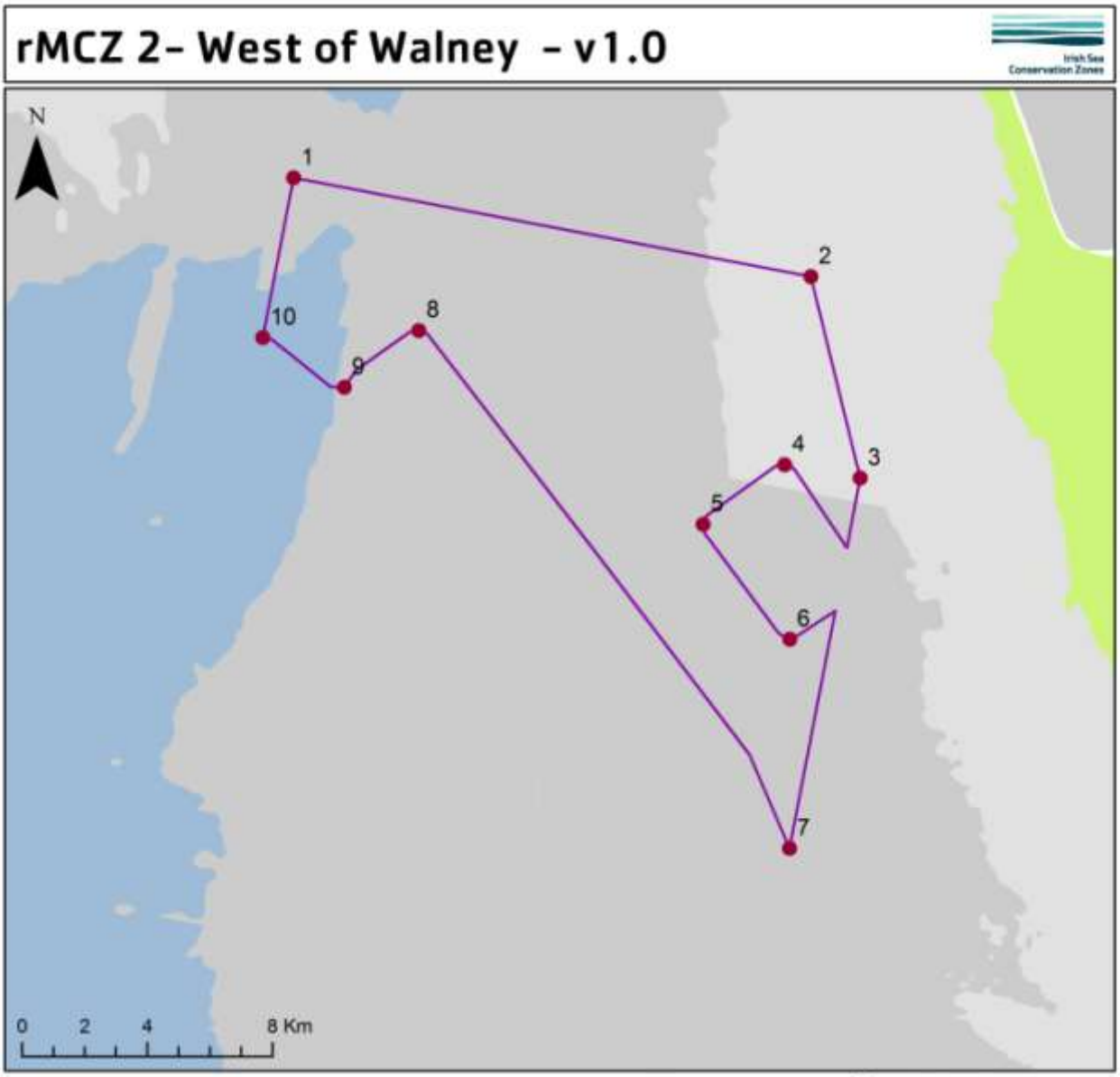
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A5.2 Subtidal sand<br>A5.3 Subtidal mud | 71.98 $km^2$, 7197.97 ha (inc pCLZ)<br>156.37 $km^2$, 15636.31 ha (exc pCLZ)<br>316.27 $km^2$, 31626.55 ha (inc pCLZ) |
| Habitat of conservation importance | Mud habitats in deep water<br>Sea-pen and burrowing megafauna communities | 80.38 $km^2$, 8037.47 ha (exc pCLZ)<br>135.4 $km^2$, 13539.78 ha (inc pCLZ)<br>These two FOCI overlap, so the area calculations apply to both. |

| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | n/a | |

## 6. Features within rMCZ 2 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Map of site




Bounding co-ordinates:

1: 54° 10' 1.636" N, 3° 42' 0.145" W
2: 54° 10' 1.498" N, 3° 26' 31.551" W
3: 54° 6' 47.489" N, 3° 23' 59.953" W
4: 54° 6' 46.685" N, 3° 26' 15.323" W
5: 54° 5' 30.858" N, 3° 28' 16.380" W
6: 54° 3' 51.229" N, 3° 25' 8.835" W
7: 54° 0' 19.968" N, 3° 24' 0.457" W
8: 54° 7' 51.868" N, 3° 37' 32.438" W
9: 54° 6' 39.890" N, 3° 39' 22.183" W
10: 54° 7' 14.411" N, 3° 41' 59.940" W

**Legend**

Depth (m)

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

# rMCZ 2- Proposed Co-location Zone - v1.0


Bounding co-ordinates:

1: 54° 10' 1.636" N, 3° 42' 0.145" W
2: 54° 10' 1.498" N, 3° 26' 31.551" W
3: 54° 6' 47.489" N, 3° 23' 59.953" W
4: 54° 6' 46.685" N, 3° 26' 15.323" W
5: 54° 5' 30.858" N, 3° 28' 16.380" W
6: 54° 3' 51.229" N, 3° 25' 8.835" W
7: 54° 0' 19.968" N, 3° 24' 0.457" W
8: 54° 7' 51.868" N, 3° 37' 32.438" W
9: 54° 6' 39.890" N, 3° 39' 22.183" W
10: 54° 7' 14.411" N, 3° 41' 59.940" W
11: 54° 2' 21.785" N, 3° 42' 0.058" W
12: 53° 59' 55.910" N, 3° 33' 6.753" W
13: 53° 56' 39.186" N, 3° 28' 54.571" W
14: 53° 56' 30.591" N, 3° 24' 31.050" W

Proposed co-location zone
rMCZ 2

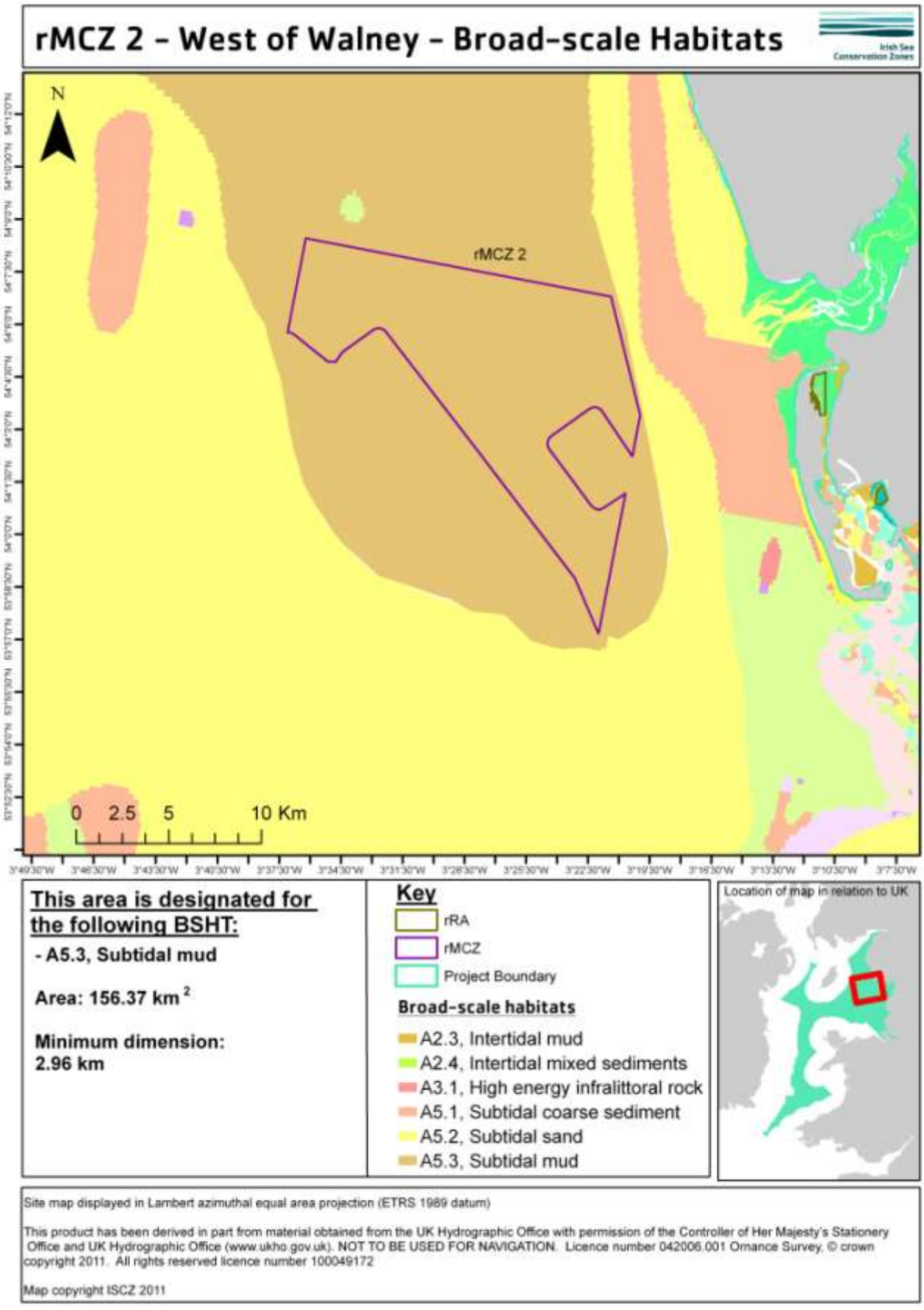
**Legend**

Depth (m)

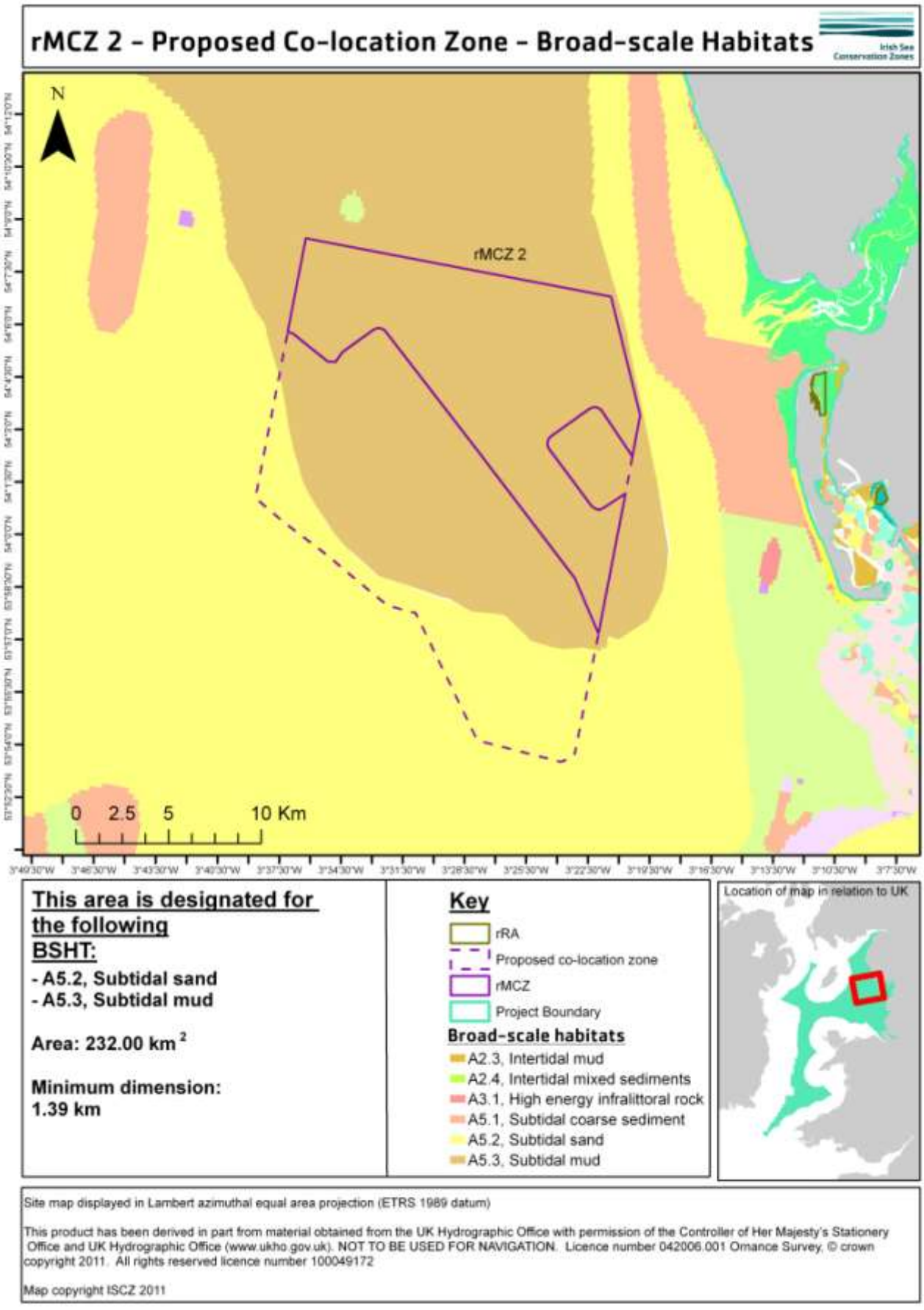
- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200

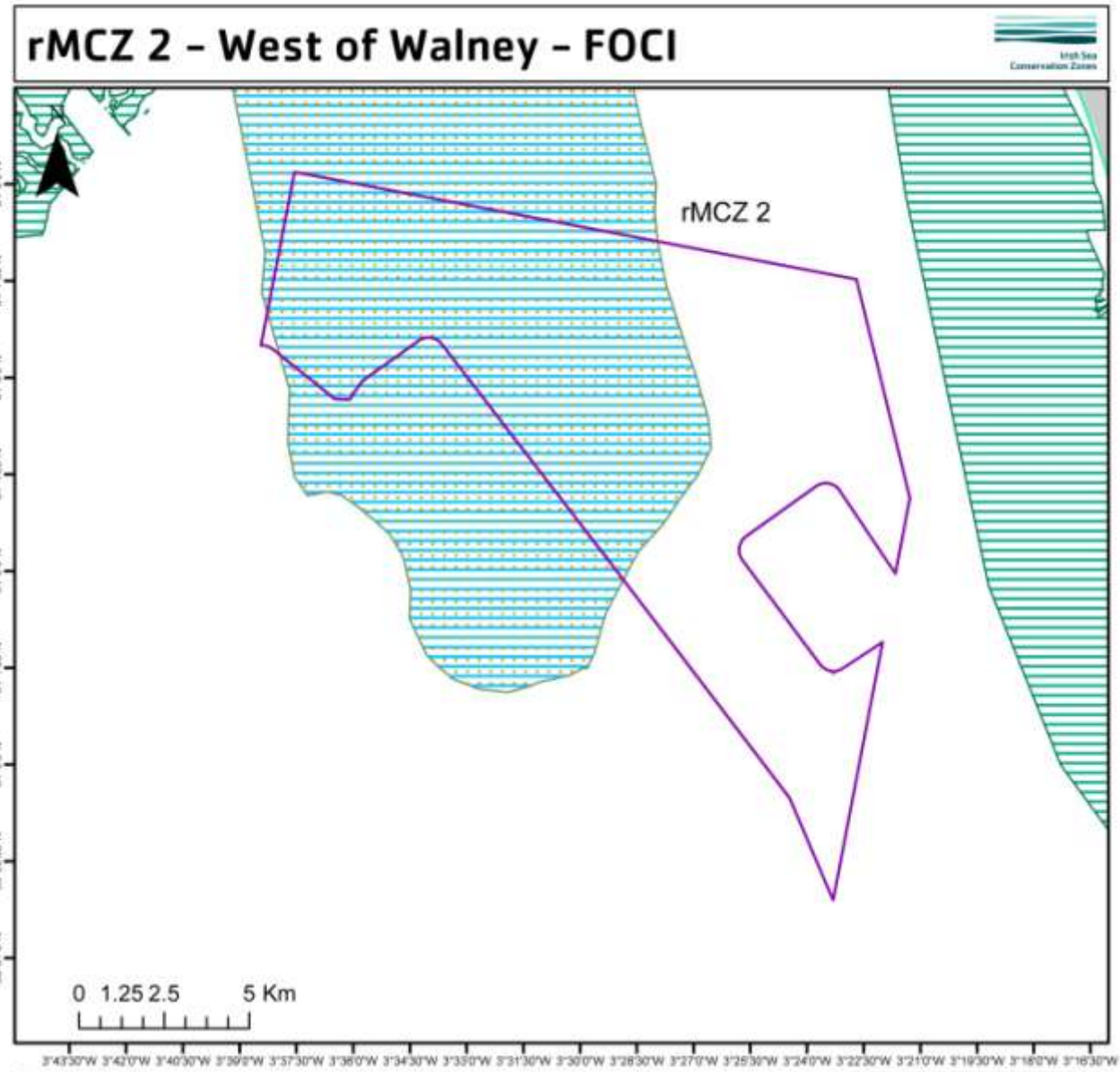
Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

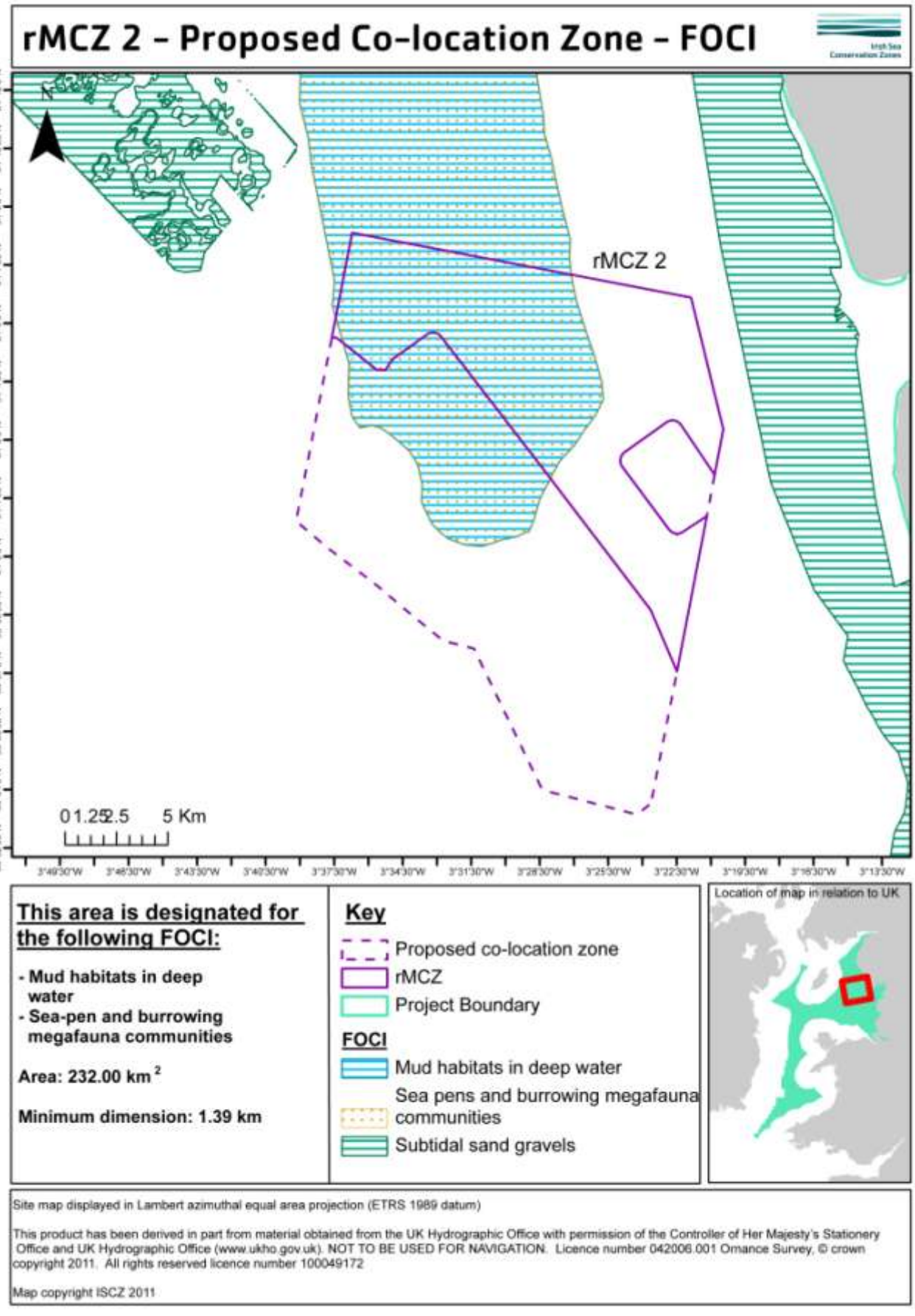



Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)


rMCZ 2 – Proposed Co-location Zone – Broad-scale Habitats
Irish Sea Conservation Zones
N
rMCZ 2
0 2.5 5 10 Km
3°49'30"W 3°46'30"W 3°43'30"W 3°40'30"W 3°37'30"W 3°34'30"W 3°31'30"W 3°28'30"W 3°25'30"W 3°22'30"W 3°19'30"W 3°16'30"W 3°13'30"W 3°10'30"W 3°7'30"W
This area is designated for the following BSHT:
- A5.2, Subtidal sand
- A5.3, Subtidal mud
Area: 232.00 km²
Minimum dimension: 1.39 km
Key
rRA
Proposed co-location zone
rMCZ
Project Boundary
Broad-scale habitats
A2.3, Intertidal mud
A2.4, Intertidal mixed sediments
A3.1, High energy infralittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.3, Subtidal mud
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011




Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)


rMCZ 2 – Proposed Co-location Zone – FOCI
rMCZ 2
0 1.25 2.5 5 Km
This area is designated for the following FOCI:
- Mud habitats in deep water
- Sea-pen and burrowing megafauna communities
Area: 232.00 km 2
Minimum dimension: 1.39 km
Key
Proposed co-location zone
rMCZ
Project Boundary
FOCI
Mud habitats in deep water
Sea pens and burrowing megafauna communities
Subtidal sand gravels
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

rMCZ 2 is located 8 km (4.6 nm) offshore (west) from Walney Island on the Cumbrian coast of northwest England. The depth range of the site is 15-33 m and the seabed is composed of two broad-scale habitat types; subtidal mud to the north and subtidal sand to the south. The mud habitat present in rMCZ2 forms part of the eastern Irish Sea mud belt, an area that is geographically isolated from the deep water mud habitat that is present in the western Irish Sea (Clements 2010). This subtidal mud is of high commercial interest, as it is the habitat of the Dublin Bay Prawn *Nephrops norvegicus*. There are a number of other species which inhabit this seabed type, including the brittlestar *Amphiura chiajei* and the burrowing sea urchin *Brissopsis lyrifera*. Lumb et al. (2011) mapped the expected distribution of sea-pens and burrowing megafauna within this part of the Irish Sea. The expected distribution was inferred from survey data and from the presence of the suitable underlying habitat type (Hughes and Atkinson 1997). Historically, sea-pens were abundant in this region (Jones et al. 1952 cited in Swift 1993), but relatively recent video survey data have indicated they are now rare in this part of the eastern Irish Sea (Hughes and Atkinson 1997). Designation of rMCZ 2 may allow for the potential recovery of sea-pens and burrowing megafauna, a habitat type which is known to be vulnerable to otter trawl impacts (Hinz et al. 2009).

## 9. Detailed site description

rMCZ2 is being recommended for designation based on the presence of two broad-scale habitat types, subtidal sand and subtidal mud. There are two associated and overlapping habitat FOCI features, mud habitats in deep water and sea-pens and burrowing megafauna communities.

rMCZ2 spans an area of habitat transition; the northern part of the site is predominantly subtidal mud whilst the southern part of the site is subtidal sand. A combination of both physical and biological data has been used to identify these seabed habitats (UK Seamap and the Mapping European Seabed Habitat projects (MESH)). The ISCZ team reclassified the mud-sand boundary in this area based on survey data provided by Dong Energy from grab samples (undertaken by CMACS) associated with Walney and Ormonde windfarm development proposals in 2009 and Lumb et al. 2011 report. The area of subtidal mud in this site is part of the larger eastern Irish Sea mud belt, which is geographically isolated from the deep water mud habitat in the western Irish Sea (Clements 2010). The area of deep water mud habitat in rMCZ2 is of high commercial fishing interest, as it is the supporting habitat of the Dublin Bay prawn *Nephrops norvegicus* (Figure 1). The eastern Irish Sea Nephrops population is smaller (in number) than that in the western Irish Sea, and the two populations are not thought to be connected through larval dispersal (Clements 2010).

Within the area mapped as mud habitats in deep water in rMCZ2, there was a notable difference in the biological community present on and offshore from video surveys taken in the central to northern extent of this mud patch (Dong Energy 2009, cited in Lumb et al. 2011). Inshore, the muddy sand community had a high abundance of bivalves *Kurtiella bidentata* and brittle stars *Amphiura filiformis*, whilst the burrows present were characteristic of the burrowing mud shrimp *Callianassa subterranean* (Dong Energy 2009, cited in Lumb et al. 2011). Offshore, the bivalves *Mysella bidentata* and *Abra nitida* were also present; these are suspension and detritus feeders.

These burrowing animals (including *Nephrops*) provide an important ecological function termed bioturbation which refers to the disturbance and mixing of sediments by organisms especially by burrowing, boring or ingestion. The activities of these animals, which can take many varied and species-specific forms, leads to the disturbance of sediments on the seafloor. For example, suspension feeders such as the burrowing mud shrimp *Callianassa subterranean* ingest the particles present within the sea water

that they draw into their burrows and the excreted material acts as cement to form the rigid structure of their burrow tubes, which provides stability to the sediment substrate (Kogure and Wada 2005).

The spoon worm *Maxmuelleria lankesteri* is another burrower which provides a similar ecosystem engineering function by providing structure to the sediment substrate. This worm is found within another habitat feature of conservation importance for which rMCZ 2 is proposed for designation, seapens and burrowing megafauna. The presence of this habitat type is based on a review of survey data conducted in the eastern Irish Sea and mapped based on the presence of the appropriate habitat type (Lumb 2011). Historically, sea-pens (namely the slender seapen *Virgularia mirabilis* Figure 2) were abundant in this region (Jones et al. 1952 cited in Swift 1993), but more relatively recent video survey data has indicated that they are now rare in this part of the eastern Irish Sea (Hughes and Atkinson 1997).

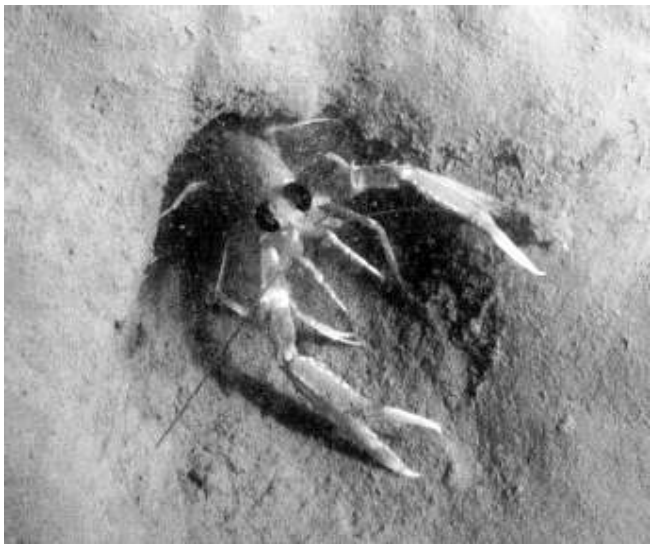


Figure 1. Burrowing *Neprhops* (Hinz et al. 2009)

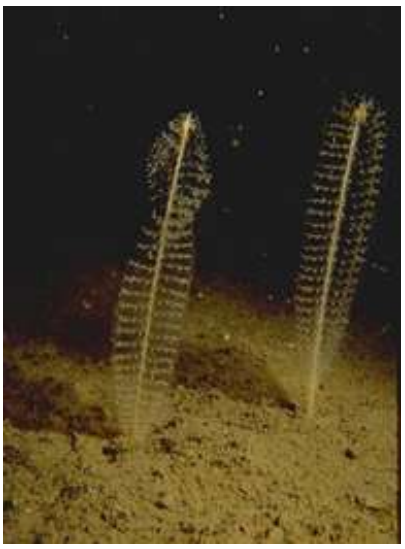


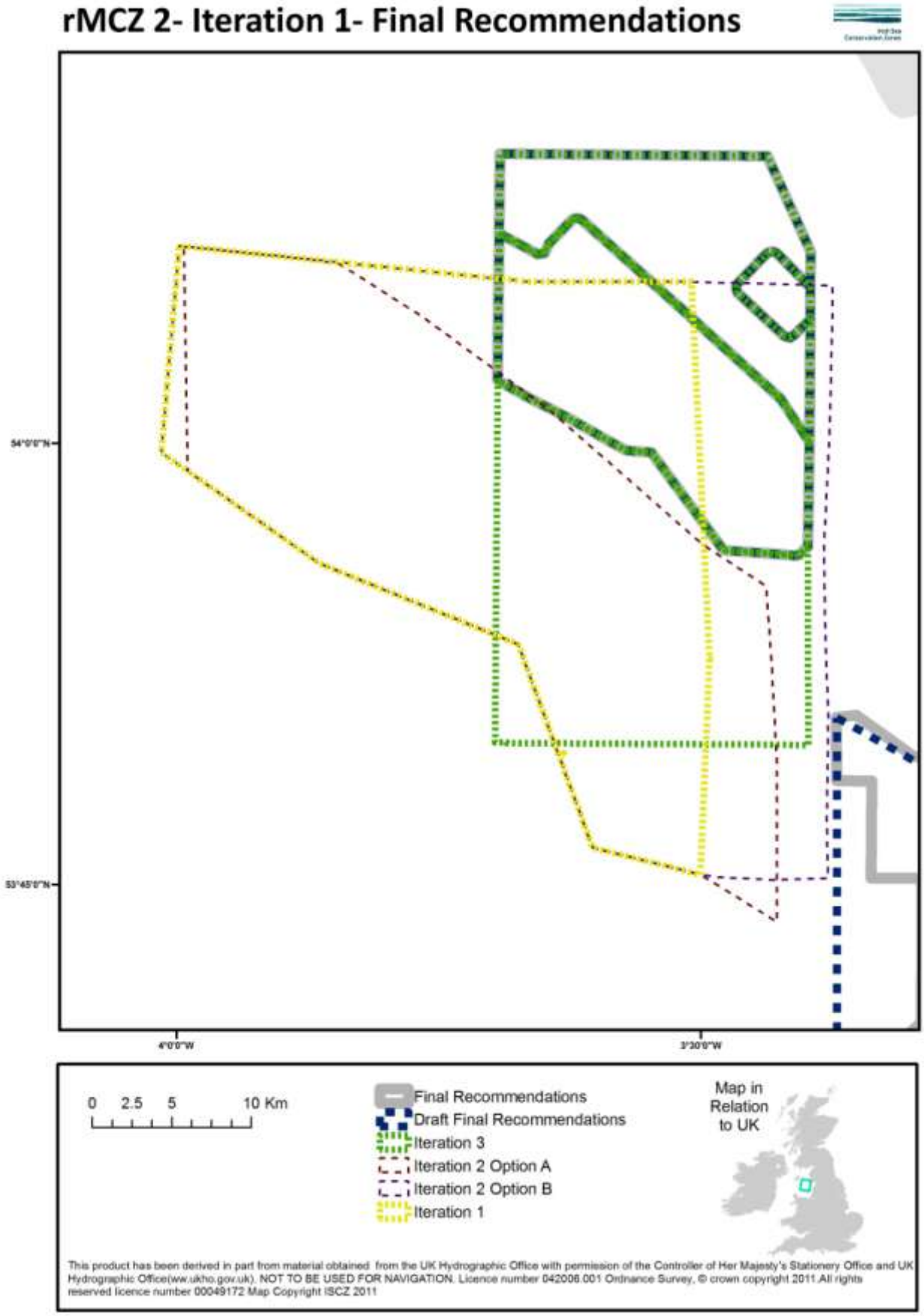
Figure 2. Slender sea pen *Virgularia mirabilis* (Sue Scott from the Marlin website)

In addition to the site outlined above, these final recommendations include a proposed co-location zone (pCLZ). The northern boundary of the pCLZ abuts onto the southern boundary of rMCZ 2 (West of Walney rMCZ). Part of the pCLZ also lies within rMCZ 2. The Regional Stakeholder Group (RSG) has assembled a statement regarding the pCLZ, which is described in further detail later in this site report. Readers of this report are also encouraged to view the RSG 8 meeting report (ISCZ 2011d) for full context on this issue.

## 10. Site boundary

The northern boundary of rMCZ2 is delineated by the 54°10'N line. The eastern boundary is delineated by the 3°24'W line. The western boundary is delineated by 3°42'W line. The proposed co-location zone to the south of rMCZ2 follows the boundary of the Walney and West of Duddon sands wind farm licence areas and also includes the smaller area of the Ormonde windfarm that is located within rMCZ2 itself. The large area to the south of the final boundary was removed for the draft final recommendations in order to minimise the impacts of the network on the Belgian fishing fleet. The areas to the west of the final boundary that were included in the first two iterations were removed largely as a result of the questionable ecological benefit that this area would bring to the network. This final boundary was largely

agreed upon on the basis that it would have the least worst impact on the commercial fishing industry, whilst contributing to the ENG targets. The development of the site through time can be seen on the below map.



# 11. Conservation objectives

### *CO's for rMCZ 2*

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mud** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Subtidal Mud** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Mud** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Organic enrichment*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farm cables, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Mud Habitats in Deep Water** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Mud Habitats in Deep Water** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Mud Habitats in Deep Water** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farm cables, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Sea-pens and Burrowing Mega Fauna Communities** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Sea-pens and Burrowing Mega Fauna Communities** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Sea-pens and Burrowing Mega Fauna Communities** are sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Surface abrasion: damage to seabed surface features<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Organic enrichment*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Salinity changes - local*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farm cables, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

***CO's for pCLZ***

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mud** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Subtidal Mud** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Mud** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Organic enrichment*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farms, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Mud Habitats in Deep Water** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Mud Habitats in Deep Water** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Mud Habitats in Deep Water** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farms, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Sea-pens and Burrowing Mega Fauna Communities** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Sea-pens and Burrowing Mega Fauna Communities** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Sea-pens and Burrowing Mega Fauna Communities** are sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Surface abrasion: damage to seabed surface features<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Organic enrichment*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Salinity changes - local*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farms, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sand** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sand** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity, telecom and power cables, offshore wind farms, oil and gas exploration and production. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, diving and other fisheries. |

## 12. Sites to which this site is related

rMCZ 2 is 8 km (4.6 nm) off the coast of Walney Island on the Cumbrian coast in northwest England. The distance between rMCZ2 and other sites which are being recommended for the designation of the same EUNIS level 2 habitat features was calculated. rMCZ2 is 15 km (8 nm) from rMCZ8, 80 km (42 nm) from rMCZ7 and 77 km (40 nm) from rMCZ3, these are all sites which are being designated for the EUNIS level 2 habitat type sublittoral sediment.

rMCZ 2 is in the vicinity of a number of existing and draft conservation areas that are being designated for marine associated features. Vicinity is defined here as being less than 80 km. Morecambe Bay (SAC, SPA, SSSI), Drigg Coast (SAC), Sefton Coast (SAC), Duddon Estuary (SAC / SPA / SSSI), Ribble and Alt Estuaries (SPA), Lune Deep (SAC), Shell Flats (SAC), are all less than 40 km (22 nm) away from rMCZ2. The following sites are within 80 km (43 nm) of rMCZ2; Solway Firth (SAC), Luce Bay and Sands (SAC), Great Ormes Head (SAC / SSSI), Cemlyn Bay (SAC), Dee Estuary (SAC), Menai Strait andConwy Bay (SAC), Puffin Island (SPA),Ynys Feurig, Cemlyn Bay and the Skerries (SAC, SSSI, SPA), Mersey Estuary (SPA).

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of subtidal sand | Combined physical and biological surveying with habitat modelling<br>Grab sampling and interpretation | MESH<br><br>Dong Energy: Walney and Ormond OWF |
| Location of subtidal mud | Combined physical and biological surveying with habitat modelling<br>Grab sampling and interpretation | MESH<br><br>Dong Energy: Walney and Ormond OWF |
| Location of mud habitats in deep water | Combined physical and biological surveying with habitat modelling | MESH |
| Location of sea-pens and burrowing megafauna | Inferred distribution based on suitable habitat type, and biological sampling. | Swift 1993; Hughes and Atkinson 1997; Lumb et al. 2011, |

## 14. Stakeholder considerations

***Caveats:***

That the potential co-location zone (pCLZ) will become part of rMCZ2 if the co-location discussions result in a mutually acceptable situation for the developers, the SNCBs, Defra, DECC and the MMO. The RSG produced a statement on this issue, to accompany the final recommendations. This statement is given below. Readers should be aware that, at the time of writing this statement, sites were referred to as pMCZs not rMCZs.

*We share a preference to see co-location of offshore infrastructure in the pMCZ 2 co-location zone as long as the co location issues can be mutually agreed between the government and the offshore infrastructure developers.*
*Without co-location, we recognise that there is a 2% shortfall of subtidal mud relative to the ENG target and we share a desire to meet that target.*
*We have all worked hard to try and achieve co location and therefore meet the subtidal mud target, but think that we have had insufficient time to come to a mutually acceptable conclusion. We believe that with a little more time and with continued discussions between offshore infrastructure developers and the government, that we think need to take place at a higher level (than the discussions that have hitherto been held), this could be achieved.*
*In the event that discussions do not result in mutually acceptable co-location (between the government and the offshore infrastructure developers) we would like it to be clear that we have considered options to meet the 15% subtidal mud target but, as an RSG, we could not reach agreement on the options that would allow us to meet the subtidal mud target.*
*We believe that the inclusion of the mud options that we considered would have unacceptable socio-economic impacts on the fishing industry. The RSG feels that it is unacceptable to ask the fishing industry to accept these further impacts in addition to those that they have already accepted. We also acknowledge that proposing an option that does not meet the ENG target for subtidal mud has environmental consequences in terms of not meeting the 15% ENG target.*

*ISCZ Regional Stakeholder Group 14th July 2011.*

***Implications:***
Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***
Most stakeholders accepted the inclusion of rMCZ2 in the final network in order to satisfy the ENG targets. Offshore windfarm developers had specific concerns about the inclusion of the pCLZ in the network but, as the above RSG statement indicates, discussions regarding co-location are ongoing at the time of writing this report. Commercial fishing interests voiced concerns about this site due to the likelihood of losing fishing grounds.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References

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# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 3 NORTH ST. GEORGE'S CHANNEL

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 3 - North St. George's Channel (this zone includes two recommended reference areas, rRA B and rRA S)

## 2. Site centre location

rMCZ 3:
53° 26' 27.618" N, 5° 5' 59.840" W
53.441004 Lat, -5.099955 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA B:
53° 30' 59.584" N, 4° 56' 38.815" W
53.516551 Lat, -4.944115 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA S:
53° 38' 3.929" N, 4° 43' 11.410" W
53.634424 Lat, -4.719836 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

1388.03 $Km^2$ (144836.9 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

## 5. Features proposed for designation within rMCZ 3

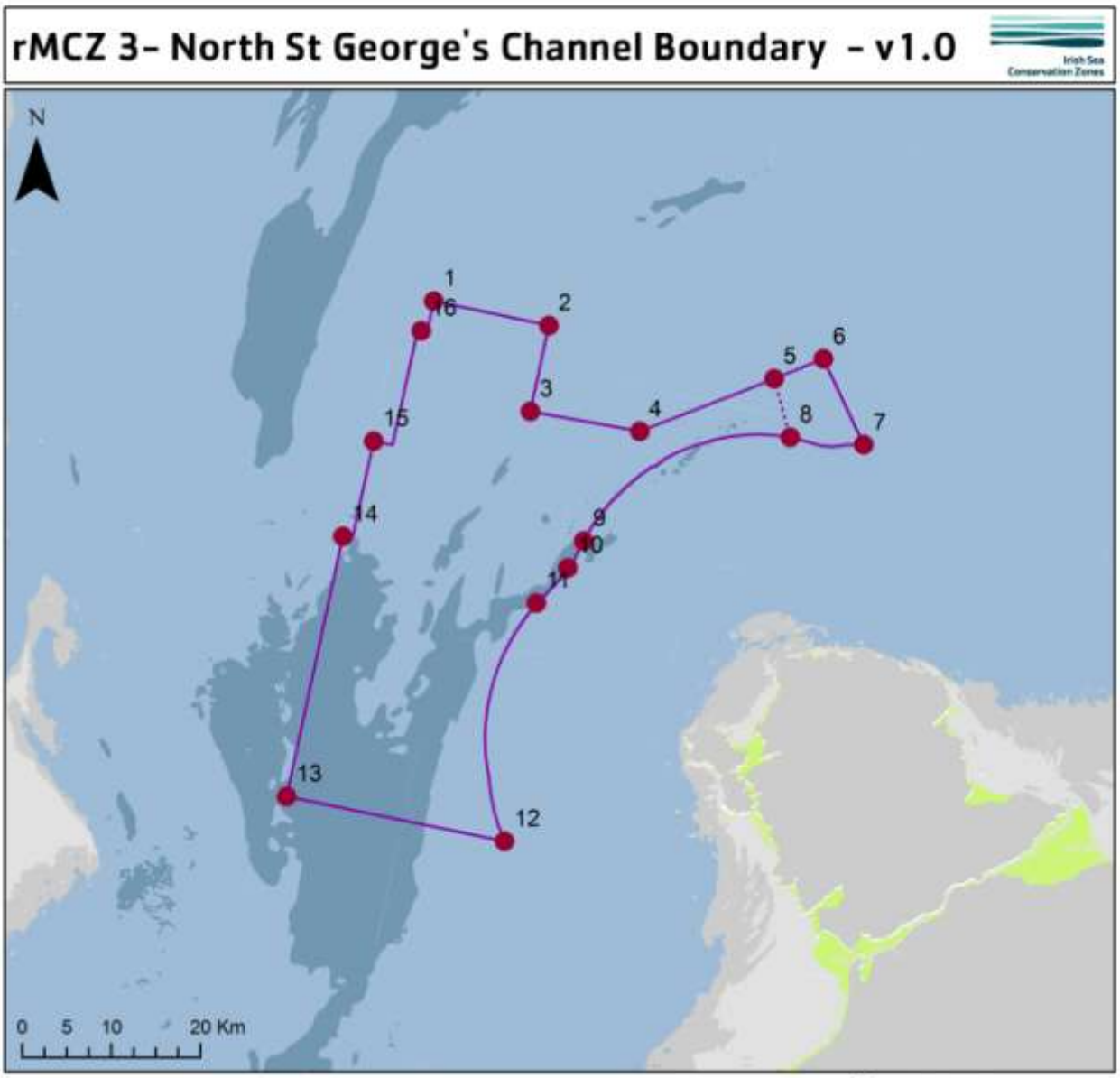
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad-scale habitat | A4.1 High energy circalittoral rock | 9.48 $Km^2$ (948.27 Ha) |
| | A4.2 Moderate energy circalittoral rock | 40.07 $Km^2$ (4007.09 Ha) |
| | A5.1 Subtidal coarse sediment | 901.06 $Km^2$ (90104.24 Ha) |
| | A5.2Subtidal sand | 336.2 $Km^2$ (33619.22 Ha) |
| | A5.4 Subtidal mixed sediment | 30.88 $Km^2$ (3088.04 Ha) |
| | A5.6 Subtidal biogenic reefs | 20.07 $Km^2$ (2006.80 Ha) |

| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Habitat of conservation importance | Horse mussel (*Modiolus modiolus)* beds<br>Subtidal sands and gravels | 20.07 $Km^2$ (2006.80 Ha)<br><br>1222.49 $Km^2$ (122247.3 Ha) |
| Species of conservation importance | n/a | n/a |
| Geological feature | n/a | n/a |
| Goemorphological feature | Drumlins | n/a |

## 6. Features within rMCZ 3 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | Ross worm (*Sabelleria spinulosa)* | Known to be present but not in high enough density to constitute a reef. |
| Species of conservation importance | Ocean quahog (*Arctica islandica)* | Present within rMCZ3 but greater abundance and breeding grounds further northwest. There was also low stakeholder confidence in the quality of the Quahog data relating to the site. |

## 7. Map of site




Bounding co-ordinates:

1: 53° 40' 59.629" N, 5° 16' 0.769" W
2: 53° 41' 0.250" N, 5° 3' 59.208" W
3: 53° 35' 43.728" N, 5° 4' 1.215" W
4: 53° 35' 53.684" N, 4° 52' 40.112" W
5: 53° 40' 38.411" N, 4° 40' 21.330" W
6: 53° 42' 24.705" N, 4° 35' 51.482" W
7: 53° 37' 50.550" N, 4° 30' 2.461" W
8: 53° 37' 23.351" N, 4° 37' 33.251" W
9: 53° 28' 45.215" N, 4° 55' 59.485" W
10: 53° 26' 58.282" N, 4° 56' 59.339" W
11: 53° 24' 30.991" N, 4° 59' 22.975" W
12: 53° 10' 6.186" N, 4° 57' 33.375" W
13: 53° 9' 59.930" N, 5° 20' 0.490" W
14: 53° 26' 0.000" N, 5° 20' 0.000" W
15: 53° 32' 0.000" N, 5° 19' 0.000" W
16: 53° 39' 5.200" N, 5° 16' 37.640" W

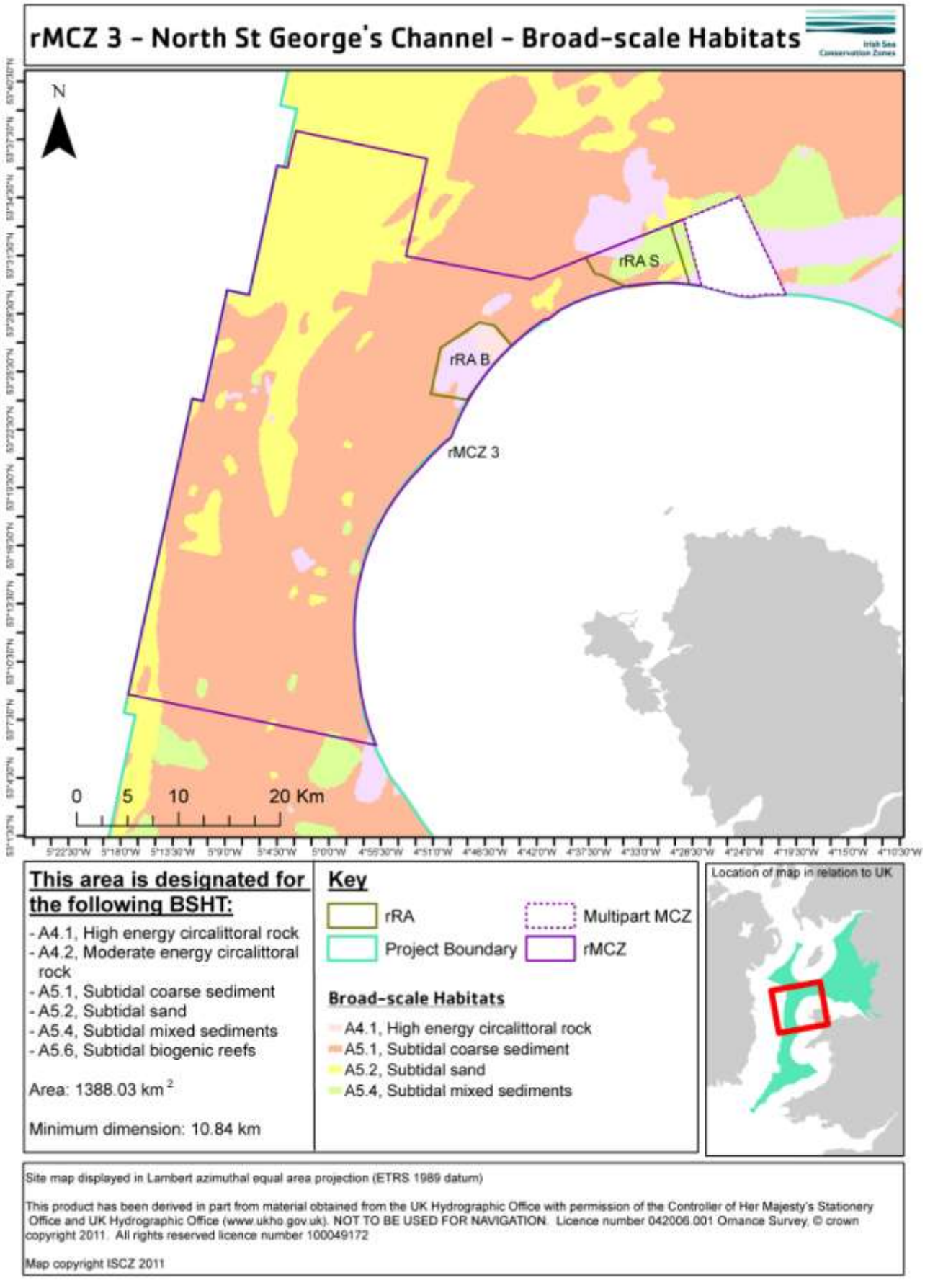
**Legend**

**Depth (m)**

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200

Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)


rMCZ 3 – North St George's Channel – Broad-scale Habitats
Irish Sea Conservation Zones
N
rRA S
rRA B
rMCZ 3
0 5 10 20 Km
5°22'30"W 5°18'0"W 5°13'30"W 5°9'0"W 5°4'30"W 5°0'0"W 4°55'30"W 4°51'0"W 4°46'30"W 4°42'0"W 4°37'30"W 4°33'0"W 4°28'30"W 4°24'0"W 4°19'30"W 4°15'0"W 4°10'30"W
This area is designated for the following BSHT:
- A4.1, High energy circalittoral rock
- A4.2, Moderate energy circalittoral rock
- A5.1, Subtidal coarse sediment
- A5.2, Subtidal sand
- A5.4, Subtidal mixed sediments
- A5.6, Subtidal biogenic reefs
Area: 1388.03 km²
Minimum dimension: 10.84 km
Key
rRA
Multipart MCZ
Project Boundary
rMCZ
Broad-scale Habitats
A4.1, High energy circalittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.4, Subtidal mixed sediments
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
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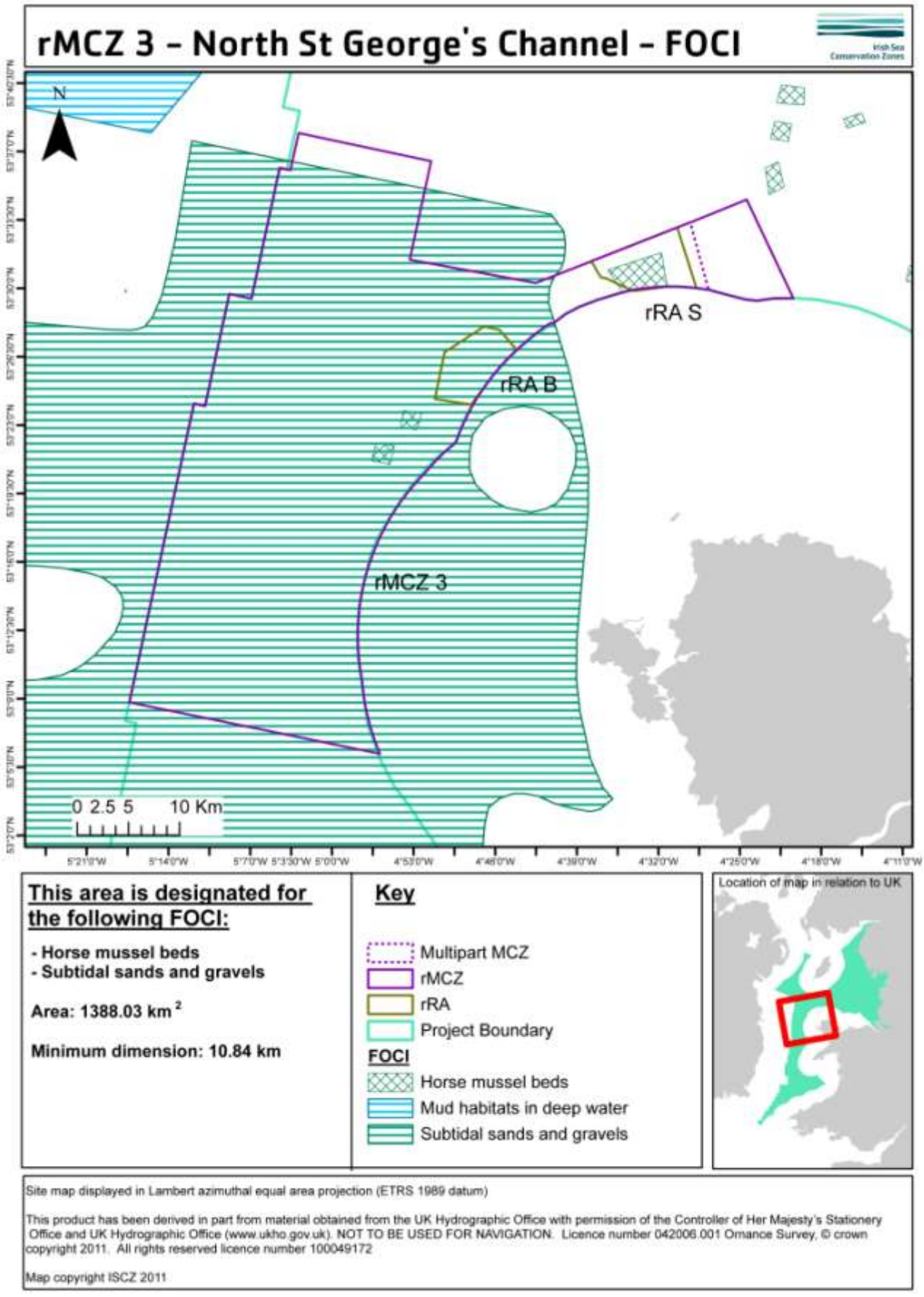

rMCZ 3 – North St George's Channel – FOCI
Irish Sea Conservation Zones
N
rRA S
rRA B
rMCZ 3
0 2.5 5 10 Km
5°21'0"W
5°14'0"W
5°7'0"W
5°3'30"W
5°0'0"W
4°53'0"W
4°46'0"W
4°39'0"W
4°32'0"W
4°25'0"W
4°18'0"W
4°11'0"W
This area is designated for the following FOCI:
- Horse mussel beds
- Subtidal sands and gravels
Area: 1388.03 km 2
Minimum dimension: 10.84 km
Key
Multipart MCZ
rMCZ
rRA
Project Boundary
FOCI
Horse mussel beds
Mud habitats in deep water
Subtidal sands and gravels
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Omance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

rMCZ 3 is a large zone in the mid-Irish Sea with biological, geological and geomorphological features of interest. The depth of the area ranges from 40 m to 170 m and it is located approximately 23 km / 12 nm northwest from the coast of Anglesey in north Wales.

Horse mussels *Modiolus modiolus* have been found in dense enough aggregations (≥50% coverage) to constitute beds, an Annex 1 Reef habitat according to the EU Habitats and Species Directive. The horse mussel *Modiolus modiolus* beds in this area support a range of filter feeding animals, for example acorn barnacle *Balanus balanus*, hydroids and soft corals (Rees 2005). One such reef has been captured within rRA S. Tube dwelling ross worms *Sabellaria spinulosa* have also been recorded in two surveyed areas, over horse mussel shells (Rees 2005) and over the Croker Carbonate Slabs (JNCC, 2011). However, it has been confirmed by JNCC that there is insufficient evidence to confirm whether these localised occurrences of *Sabellaria Splinulosa* are in dense enough aggregations to constitute a biogenic reef. Therefore, the species *Sabellaria spinulosa* has been noted as present but not designated as a *Sabellaria spinulosa* reef.

The Croker Carbonate Slabs is an area within rMCZ3 that has been recommended to Defra as a Special Area of Conservation (SAC), based on the presence of an Annex 1 habitat, submarine structures made by leaking gases. These methane-derived carbonate structures provide a unique seabed habitat for a range of soft corals, filter feeders, sponges, tube worms and anemones (Whomersley et al. 2010, JNCC, 2011).

The majority of the seabed in this area is composed of a mixture of sediments, categorised as the FOCI habitat subtidal sands and gravels. This is a very common substrate type in the Irish Sea and throughout UK waters. Sands and gravels in the Irish Sea tend to host a range of invertebrates.

## 9. Detailed site description

rMCZ3 is the largest recommended MCZ in the Irish Sea, and this extensive area covers a range of biological, geological and geomorphological features of interest.

The seabed in rMCZ3 has been mapped using a combination of physical and biological data (UK Seamap, the Mapping European Seabed Habitat projects (MESH), and the HABMAP project). The predominant broad-scale habitat types present in the area are the three (subtidal coarse sediment, subtidal sand subtidal mixed sediment) which constitute the FOCI habitat subtidal sands and gravels. In this region, sands and gravels tend to support an abundance of bivalves and polychaete worms. Bolam et al. (2010) identified molluscs and annelid worms which live within the sediment as the main secondary producers in this part of the Irish Sea. These invertebrates are a key part of the food chain; they recycle organic matter from within the sediment, linking primary production from the plankton to predatory fish (Bolam et al. 2010).

There are two additional broad-scale habitat types present in rMCZ3, high and moderate energy circalittoral rock, or bedrock on the seafloor which is subject to a high to moderate level of wave and tidal energy (MESH, 2008). The majority of these broad-scale habitat types have been captured within reference area B, which is situated in the central north-eastern part of rMCZ3. Parts of these areas of bedrock have been surveyed to verify the presence of specific Annex 1 reef habitat, listed on the EU Habitats and Species directive.
Biological and acoustic survey data have indicated that boulders and cobbles present in rMCZ3 (specifically the northwest corner) are home to animal species such as the tube worm *Pomatoceros triquete* and the

soft coral, dead man's fingers *Alcyonium digitatum* along with hydroids, such as *Abietinaria abietin* (Blyth-Skyrme et al. 2008).

During a JNCC commissioned CEFAS survey on the Croker carbonate slabs (JNCC 2011), a high abundance of ross worm *Sabellaria spinulosa* were recorded in rMCZ3. *Sabellaria spinulosa* is a tubeworm which ingests particles from the surrounding water and from this excretes a cement like substance to form the tube in which they live. Collectively these worms can form dense aggregations, or reefs, which stabilise the substrate and provide an important habitat for a host of other species (Maddock 2010). The survey of the Croker carbonate slabs revealed that the ross worms present were associated with byrozoans, hydroids and sponges (Whomersley et al. 2010). It is important to note that the OSPAR definition of ross worm *Sabellaria spinulosa* reefs on rocky habitat are areas with a minimum of 50% *Sabellaria* coverage. Unfortunately, there has been no assessment as to whether there are occurrences of *Sabellaria spinulosa* reef at this location, which is the habitat FOCI listed in the ENG. As such, *Sabellaria spinulosa* is not proposed for designation in rMCZ3.

Large parts of the Irish Sea were surveyed as part of the Strategic Environment Assessment (SEA, 2005) for offshore energy licensing. This information, which became publically available in 2005, confirmed the presence of another biogenic reef type in rMCZ3, horse mussel *Modiolus modiolus* beds (Rees, 2005). This is an important addition to the ISCZ network, as this is a habitat FOCI that is not present with any confidence in any other rMCZ.

Horse mussel beds support a range of other suspension feeders, providing a link in the food chain by connecting primary production in the plankton to the benthos (sea bed organisms), termed 'benthic-pelagic coupling' (Tyler-Walts 2007). Bivalves also perform a number of essential roles for optimum ecosystem functioning. They play a key role in unlocking the energy of primary producers, which in the sea are the phytoplankton (microscopic algae), making it available to be used as food by other creatures. As such, primary producers are the very basis of the food chain that provides the fish that humans consume. It is the bivalves and other suspension feeders that make that energy readily available and useable to the next organism in the food chain. They filter suspended particles from the water column (via a siphon which extends up into the water) and discharge nutrient rich particulates onto the seabed (Dame, 1996). Such deposits promote the growth of deposit feeding and herbivorous benthic (seabed) invertebrates, which serve as prey for crabs and demersal fish (those that live on or near the seabed). Horse mussel beds may also be an important feeding and nursery ground for demersal fish (Hinz et al. 2010).

Basking sharks *Cetorhinus maximus* are now marked as endangered on the International Union for Conservation of Nature red list of threatened species. Satellite tracking of these important species revealed that St. George's Channel was part of their migratory route utilising the nutrient rich waters, formed by tidal mixing currents (Stephan *et al.* 2011). As such, whilst they are not features proposed for designation, they may benefit indirect protection as a result of designation of rMCZ 3.

rMCZ 3 includes one of two areas in the Irish Sea where Annex 1 habitat feature 'submarine structures made by leaking gases' has been recorded. The Croker Carbonate Slabs are located 30 km west of Anglesey and are composed of areas of methane derived authigenic carbonate structures which provide a habitat type that hosts species that are not found in the surrounding areas, where the majority of the substrate is made of coarse sediment. From a JNCC commissioned CEFAS survey, a diverse and varied benthic community was recorded, including hydroids, polymastid sponges, soft corals, such as the ross coral as well as large areas covered by the tubeworm *Sabelleria spinulosa* (JNCC 2011).

The RSG agreed, in the final (June 13th and 14th 2011) meeting, to further extend the north eastern boundary of rMCZ3 to include part of an extensive and regionally important drumlin field. These palaeo-ice flow parallel bedforms are, on average, 100–400 m long and 1–20 m high. Most of the lee sides are steeper than 10°, with values up to 24°. In this area the glacial features are aligned in a similar direction to the current, resulting in the current running along-slope (Van Landeghem *et al.,* 2008). Blyth-Skyrme et al (2008) found patches of boulder reef that were associated with the drumlin landforms. These areas complied with the definition of reef according to the EU Habitats Directive (CEC 2007) in that they were comprised of cobbles and boulders, were topographically distinct from the surrounding area, and supported a typical reef fauna, comprised of hydroids, soft corals and bryozoans.

Recent mapping efforts for the British and Irish Isles have collated information on the very large datasets of drumlins that exist in these islands. They have been observed and mapped, using high resolution digital elevation models (DEMs) and satellite images for the land area (ca 311,000 $km^2$) of the British and irish Isles (Great Britain, Northern Ireland and the Republic of Ireland) (Clark et al., 2009). This terrestrial database includes 58,983 drumlins in total: comprising 37,043 in Great Britain and 21,940 in Ireland. Increasingly the offshore sectors of the former British and Irish Ice Sheet has been mapped and have identified further drumlin fields on the sea floor (e.g. van Landeghem et al., 2009; Dunlop et al., 2010). The drumlins on the sea floor between Anglesey and the Isle of Man are a small subset of these subglacial landforms associated with the last Irish Sea Ice Stream (ISIS). The ISIS advanced out of source areas in Scotland and other mountain regions after 34 kyrs ago, reaching maximum extent at the Scillies c. 24 kyrs and declined to evacuate the northern Irish Sea basin ~19 kyrs, with a re-advance in the northern sector ~ 17 kyrs.

The setting of this area in the context of the ISIS has some importance; it is in the centre of the Irish Sea Basin rather than the margins and in a zone of converging ice flow, moving to the west and turning south into the deeper central Irish Sea Basin. The morphological features (e.g. the drumlins proposed for designation in rMCZ3) relate a history of grounded ice flow during deglaciation 21-19 kyrs ago during the passage of the ice margin northwards. Iceberg scour marks on the subglacial terrain show that retreat of the grounded ice margin northwards terminated into a water-mass with a carving margin producing icebergs. Examination of the sea floor imagery used by van Landeghem et al. (2009) to map the area between Anglesey and the Isle of Man shows some little evidence for remobilisation and erosion of the subglacial terrain with marine processes keeping the terrain clear of postglacial sediments. The seascape is a well preserved relict subglacial land surface, with little potential for natural change over the coming centuries.

Site identification work was supported by knowledge and data for several important seabird species. rMCZ 3 is an important area for seabirds in the Irish Sea providing a foraging ground to a wide range of species. These include: guillemots (*Uria aalge*), gannets (*Morus bassanus*), Manx shearwaters (*Puffinus puffinus*) and puffins (*Fratercula arctica*). These birds can have significant foraging radii (the gannet can travel up to 300 km) and will originate from Welsh and Irish colonies, in particular the rocky cliffs on the Anglesey coast where there are a number of SACs and SPAs that offer protection to bird species (such as the Skerries) (Gouldstone pers comm. 2011).

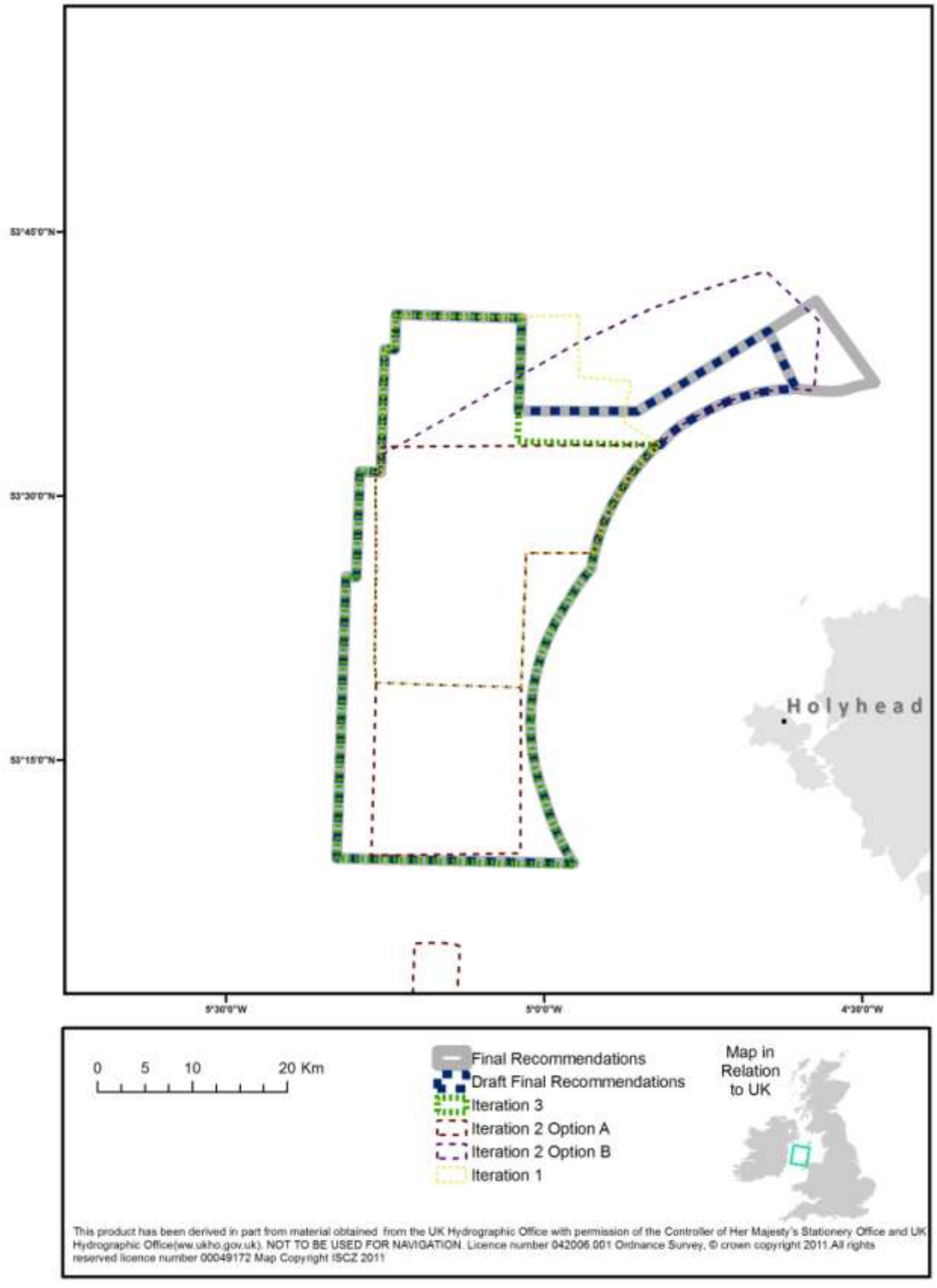
The European seabirds at sea data (JNCC 2011) show that the northern section of the site, which contains an important pelagic front, is heavily used by a number of species. These species utilise the site and, in particular, the sand habitats within it to feed. Locally, guillemots (*Uria aalge*) feed on sandeel, herring and sprat; puffins (*Fratercula arctica*) feed on sandeel and capelin; gannets (*Morus bassanus*) feed on mackerel,

herring and sandeel; Manx shearwaters (*Puffinus puffinus*) feed on herring, sprat, whitebait and pilchards (Gouldstone pers comm. 2011).

## 10. Site boundary

This site was identified as early as the 1st iteration as it [then] contained the only example of High Energy Circalittoral Rock in the project area. Its exact boundary has changed throughout the process, with subsequent additions to the north and south for ecological (e.g. horse mussel data, thermal front data) and geomorphological reasons (e.g. drumlins), but it has largely remained in a similar location throughout. The site now abuts onto Welsh territorial waters and Republic of Ireland waters; this is largely to facilitate the join up of any future potential marine protected areas, if this is deemed appropriate. The development of the site through time can be seen on the below map.

# rMCZ 3- Iteration 1- Final Recommendations



## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sand** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sand** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sands and Gravels** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sands and Gravels** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | Subtidal sands and gravels are sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Removal of target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Subtidal Coarse Sediment**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Coarse Sediment** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Coarse Sediment** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Physical change (to another seabed type)*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Subtidal Mixed Sediment** , such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Mixed Sediment** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Mixed Sediment** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Introduction of microbial pathogens (disease)*<br>• *Salinity changes - local*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Water clarity changes* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **High Energy Circalittoral Rock** such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **High Energy Circalittoral Rock** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **High Energy Circalittoral Rock** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Removal of target species (lethal)*<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Salinity changes – local*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes - local*<br>• *Water clarity changes*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Moderate Energy Circalittoral Rock**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Moderate Energy Circalittoral Rock** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Moderate Energy Circalittoral Rock** is sensitive to the pressures : (Feature is not currently exposed to pressures in *Italics)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Salinity changes - local*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water clarity changes*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the ***Modiolus modiolus* (Horse Mussel) Beds** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of ***Modiolus modiolus* (Horse Mussel) Beds** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Modiolus modiolus* (Horse Mussel) Beds** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Surface abrasion: damage to seabed surface features<br>• *Removal of target species (lethal)*<br>• *Removal of non-target species (lethal)*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - local*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Water flow (tidal & ocean current) changes - regional/national*<br>• *Water flow (tidal current) changes - local*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Salinity changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Drumlins**, such that: |
| 2<br>Attributes and parameters | the<br><br>• extent,<br>• component features,<br>• spatial distribution,<br>• integrity<br>• natural environmental quality*, and<br>• natural environmental processes*<br><br>Representative of **drumlins** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Biogenic Reefs** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Biogenic Reefs** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Biogenic Reefs** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Surface abrasion: damage to seabed surface features<br>• *Removal of target species (lethal)*<br>• *Removal of non-target species (lethal)*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - local*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Water flow (tidal & ocean current) changes - regional/national*<br>• *Water flow (tidal current) changes - local*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Salinity changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

rMCZ3 is located in the mid-Irish sea, 88 km (47 nm) to the north of another recommended MCZ (rMCZ4). It is located 80 km (43 nm) from the Lleyn Peninsula and Sarnau (Welsh inshore SACs) with marine components, which include horse mussel beds and ross worm *Sabellaria spinulosa* reefs. It is located 35 km (19 nm) from the Menai Strait and Conwy Bay Welsh inshore SACs which also designate marine components.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of high energy circalittoral rock | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH, Blyth-Skyrme et al. 2008 |
| Location of moderate energy circalittoral rock | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH, Blyth-Skyrme et al. 2008 |
| Subtidal coarse sediment | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH. |
| Subtidal sand | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH. |
| Subtidal mixed sediment | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH. |
| Subtidal sands and gravels | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007), MESH. |
| Horse mussel *Modiolus modiolus* beds | Physical and Biological survey | Rees (2005)<br>SEA survey |
| Ross worm *Sabellaria spinulosa* reefs | Biological survey | Whomersley et al. 2010 |
| Ocean quahog *Arctica islandica* | Biological survey | CEFAS surveyors 1998 |
| Croker carbonate slabs (submarine structure made by leaking gases) | Biological survey | JNCC 2011 |

## 14. Stakeholder considerations

***Caveats:***

- Cable work (installation, maintenance and decommissioning) would be allowed to continue in line with current legislation. This caveat applies to existing and future cables (e.g. those associated with adjacent Round 3 offshore windfarms).
- The part of rMCZ3 that proposes designation of drumlins (to the far north-east of the site) was agreed on the basis that the underlying broad-scale habitats and FOCI would not be proposed for designation.
- Scallop dredging and other commercial fishing would be allowed to continue in the area of rMCZ3 that is proposed for designation of drumlins only.
- The offshore wind developers reluctantly accepted the group decision to propose designation of drumlins, but pointed out that the industry could/might face additional costs as a result.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most stakeholders accepted the inclusion of rMCZ3 in the final network in order to satisfy the ENG targets. Conservation stakeholders in particular expressed strong support for inclusion of this site. Most concerns were related to future development in the adjacent Centrica Round 3 offshore wind area of search, and the potential implications associated with designating this rMCZ. There are several important fishing grounds in rMCZ3 and concerns were raised over the ability to maintain use of these grounds if/when the site is designated.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

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# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT RMCZ 4 MID ST. GEORGE'S CHANNEL

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ4 – Mid st. Georges Channel (zone includes recommended reference area rRA C)

## 2. Site centre location

rMCZ 4:
52° 39' 31.843" N, 5° 16' 6.465" W
52.658845 Lat, -5.268462 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA C:
52° 37' 32.293" N, 5° 22' 54.816" W
52.625636 Lat, -5.381893 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

760.86 $Km^2$ (76084.72 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

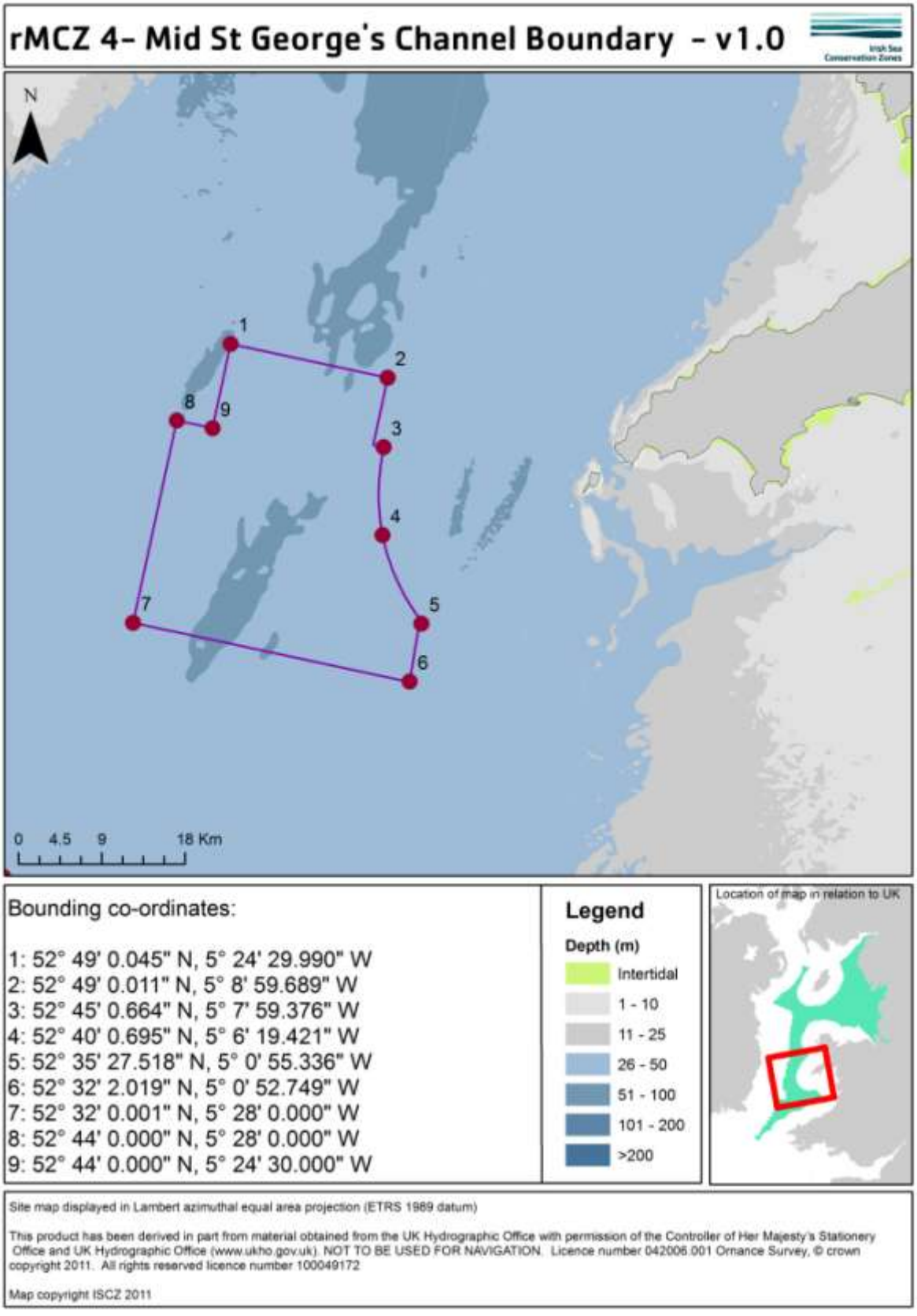
## 5. Features proposed for designation within rMCZ4

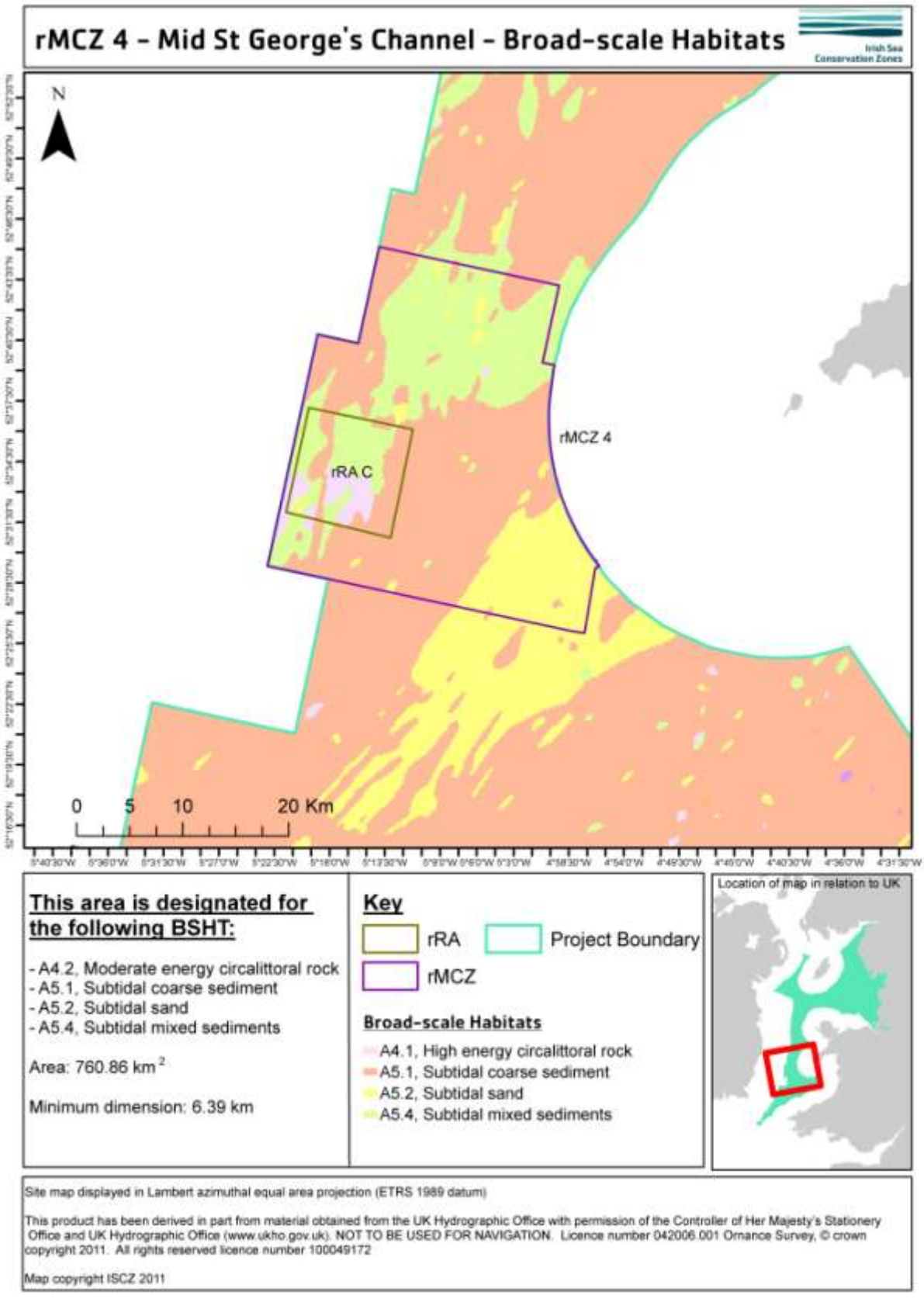
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A4.2 Moderate energy circalittoral rock<br>A5.1 Subtidal coarse sediment<br>A5.2 Subtidal sand<br>A5.4 Subtidal mixed sediments | 26.67 $Km^2$ (2667.05 Ha)<br>368.24 $Km^2$ (36823.04 Ha)<br>114.42 $Km^2$ (11441.68 Ha)<br>246.31 $km^2$ (24630.38 Ha) |
| Habitat of conservation importance | Subtidal sands and gravels | 760.86 $Km^2$ (76085.04 Ha) |
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | n/a | |

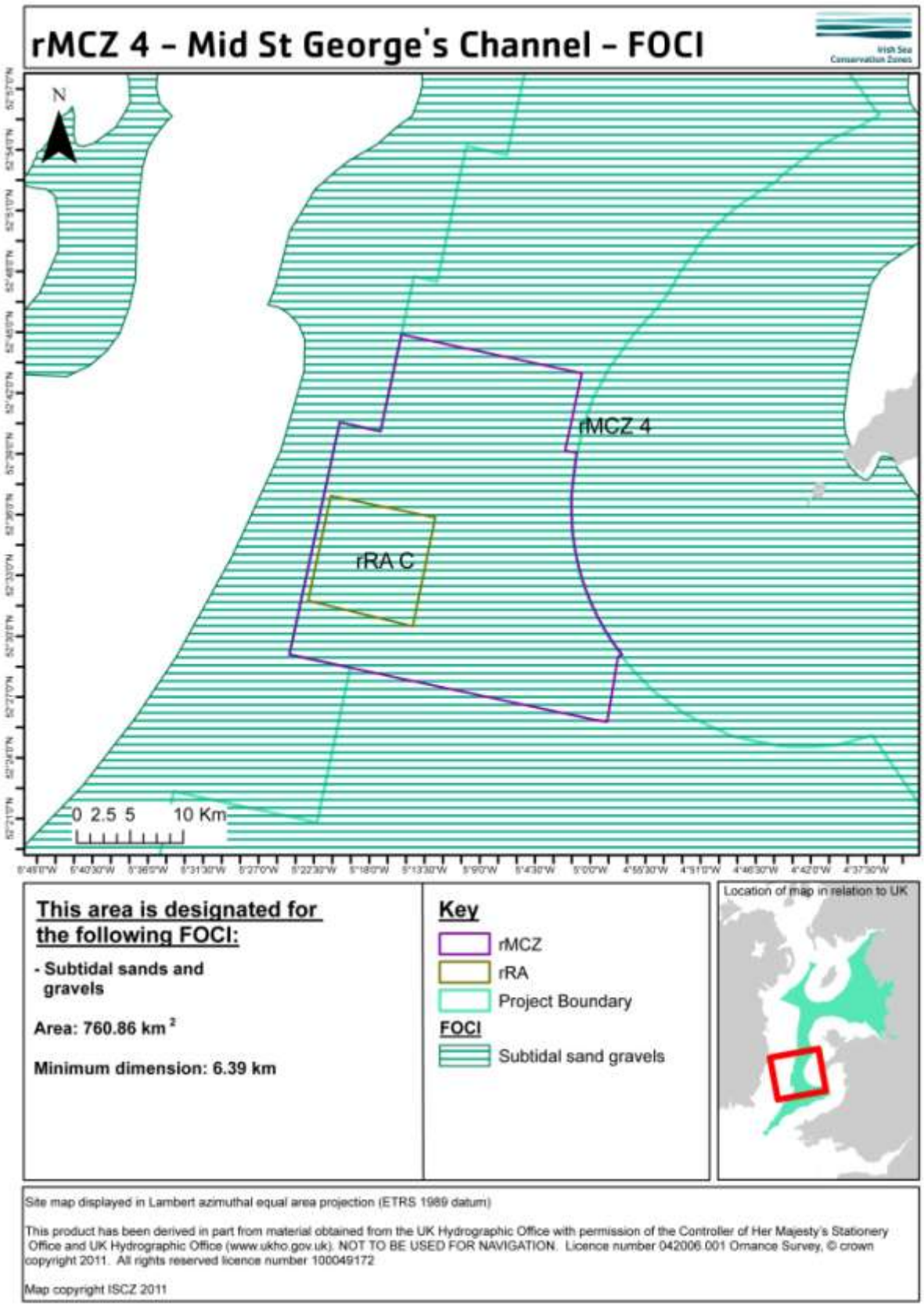
# 6. Features within rMCZ4 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Map of site


rMCZ 4- Mid St George's Channel Boundary - v1.0
Irish Sea Conservation Zones
N
1
2
3
4
5
6
7
8
9
0 4.5 9 18 Km
Bounding co-ordinates:
1: 52° 49' 0.045" N, 5° 24' 29.990" W
2: 52° 49' 0.011" N, 5° 8' 59.689" W
3: 52° 45' 0.664" N, 5° 7' 59.376" W
4: 52° 40' 0.695" N, 5° 6' 19.421" W
5: 52° 35' 27.518" N, 5° 0' 55.336" W
6: 52° 32' 2.019" N, 5° 0' 52.749" W
7: 52° 32' 0.001" N, 5° 28' 0.000" W
8: 52° 44' 0.000" N, 5° 28' 0.000" W
9: 52° 44' 0.000" N, 5° 24' 30.000" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 4 – Mid St George's Channel – Broad-scale Habitats
Irish Sea Conservation Zones
N
rMCZ 4
rRA C
0 5 10 20 Km
This area is designated for the following BSHT:
- A4.2, Moderate energy circalittoral rock
- A5.1, Subtidal coarse sediment
- A5.2, Subtidal sand
- A5.4, Subtidal mixed sediments
Area: 760.86 km 2
Minimum dimension: 6.39 km
Key
rRA
Project Boundary
rMCZ
Broad-scale Habitats
A4.1, High energy circalittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.4, Subtidal mixed sediments
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 4 – Mid St George's Channel – FOCI
Irish Sea Conservation Zones
N
rMCZ 4
rRA C
0 2.5 5 10 Km
5°49'0"W 5°40'30"W 5°36'0"W 5°31'30"W 5°27'0"W 5°22'30"W 5°18'0"W 5°13'30"W 5°9'0"W 5°4'30"W 5°0'0"W 4°55'30"W 4°51'0"W 4°46'30"W 4°42'0"W 4°37'30"W
This area is designated for the following FOCI:
- Subtidal sands and gravels
Area: 760.86 km 2
Minimum dimension: 6.39 km
Key
rMCZ
rRA
Project Boundary
FOCI
Subtidal sand gravels
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

rMCZ4 is located in the offshore waters of the Irish Sea, c.23 km (12.3 nm) from the coast of Wales. It is situated between Irish offshore waters to the west and Welsh territorial waters to the east. The depth of the site ranges from 60 – 125 m. The seabed type is predominantly subtidal coarse sediment, but there are also areas of subtidal mixed sediments, sand and bedrock, which is potentially reef habitat (Dalkin 2008). Due to the thermal fronts that form in the summer months, this is thought to be an area of relatively high biological productivity (Miller et al. 2010). This highlights the importance of this site for general ecosystem processes, as an increase in primary production attracts herbivorous species and, in turn, larger marine predators to the area. Within the subtidal sands and gravel habitat in this area, annelid worms, bivalves and crustaceans are the main secondary producers. These invertebrates provide an essential link in energy flow within the ecosystem, recycling organic matter in the sediment, linking primary production to predatory fish (Bolam et al. 2010).

## 9. Detailed site description

A combination of physical and biological surveys have been used to identify the seabed habitat types within the area (UKSeaMap: Connor et al. 2006, the Mapping European Seabed Habitat projects (MESH), and HABMAP: Robinson et al. 2007). The predominant marine habitat type in rMCZ 4 is subtidal coarse sediment, amongst which are smaller areas of sand, mixed sediment and bedrock. A JNCC commissioned survey collected data from around this region to verify the presence of potential reef habitat amongst the areas of rocky habitat (Dalkin 2008). From the JNCC survey, technical issues precluded video and still photographs from being collected of the seabed and therefore the presence of reef habitat within site rMCZ4 has not been verified through biological sampling. However, inferences on the biological community in rMCZ 4 can be drawn from the shared broad-scale habitat type (moderate energy circalittoral rock, or subtidal bedrock) that was successfully surveyed to the north of the site.

The subtidal bedrock, namely cobbles and boulders was the reef habitat surveyed to the north of the site. This habitat is of ecological importance because it supports a diverse animal community. Barnacles and worms, including *Pomatoceros triqueter* were found within the offshore circalittloral coarse sediment , whilst the subtidal mixed sediments contained pebbles, cobbles and boulders that were home to a diverse range of fauna, including barnacles, hydroids, anemones and sponges, for example, dead man's fingers (Dalkin et al. 2008; Figure 1).

Sand and gravel sediments are the most common habitat types found in the site and these are host a range of different invertebrate species. Within and around rMCZ4 annelids, worms and crustacean species are the main secondary producers in the food web (Bolam et al. 2010). These species, which live within or on the seabed, play a key role in recycling organic matter within the sediment, and linking the primary production (in the plankton) with predatory fish.

In addition, this site covers an area of high primary productivity, due to the thermal fronts which commonly form in this location (Miller et al. 2010). An increase in solar energy during spring causes the relatively warm, less dense, water to sit on top of colder, denser, deep water. This increase in

temperature triggers an increase in biological productivity, similar to the increase in productivity later on in the year when water cooling allows for nutrient rich deeper waters coming in from the Atlantic to mix with the surface waters (Brown et al. 2010).

Figure 1. Cobbles and boulders with gravel and sand surveyed to the north of rMCZ4. These habitat types are home to barnacles, hydroids, anemones and dead man's fingers (Image taken from Dalkin 2008).

Basking sharks *Cetorhinus maximus* are now marked as endangered on the International Union for Conservation of Nature red list of threatened species. Satellite tracking of these important species revealed that St. George's Channel was part of their migratory route utilising the nutrient rich waters, formed by tidal mixing currents (Stephan *et al.* 2011). As such, whilst they are not features proposed for designation, they may benefit indirect protection as a result of designation of rMCZ 4.

Site identification work was supported by knowledge and data for several important seabird species. rMCZ 4 is an important area for seabirds in the Irish Sea providing a foraging ground to a wide range of species, these include: guillemots (*Uria aalge*), gannets (*Morus bassanus*), Manx shearwaters (*Puffinus puffinus*) and puffins (*Fratercula arctica*). These birds can have significant foraging radii (the gannet can travel up to 300 km) and will originate from Welsh and Irish colonies, in particular Cardigan Bay and rocky cliffs on the east coast of Ireland (Gouldstone pers comm. 2011).

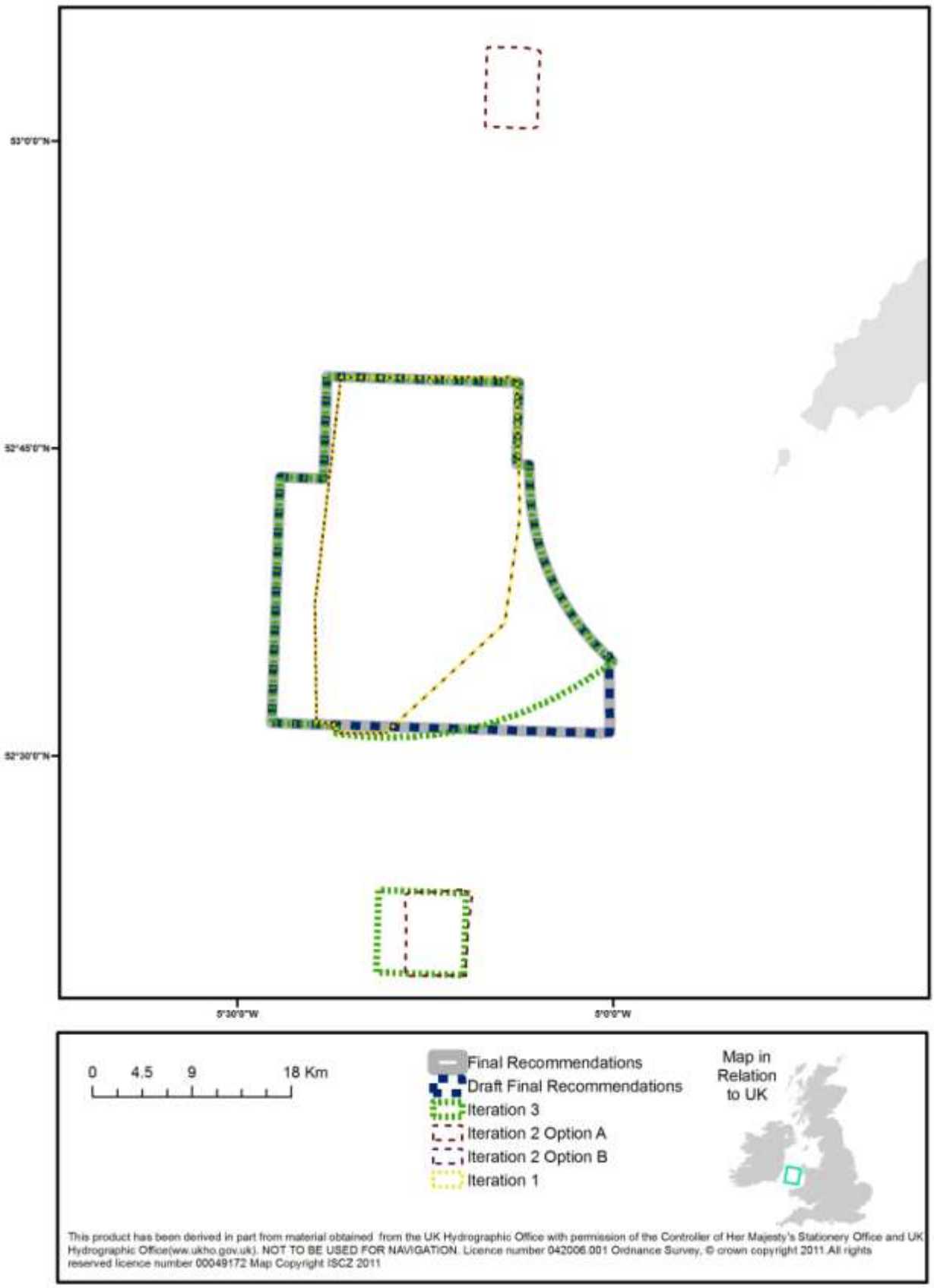
RSPB data incorporated in the Areas of Additional Ecological Importance GIS layer shows that the north eastern section of the site, which contains a productive pelagic front, is heavily used by a number of species. These species utilise the rMCZ and, in particular, the sandy and mixed habitats within it to feed. Locally, guillemots (*Uria aalge*) feed on sandeel, herring and sprat; puffins (*Fratercula arctica*) feed on sandeel and capelin; gannets (*Morus bassanus*) feed on mackerel,

herring and sandeel; Manx shearwaters (*Puffinus puffinus*) feed on herring, sprat, whitebait and pilchards (Gouldstone pers comm. 2011).

## 10. Site boundary

This site was identified as early as the first iteration to capture in the network the large amount of subtidal mixed sediments in the project area. Its boundary has changed relatively little since the first iteration but, for the draft final recommendations, the southern boundary was altered (moved further north) slightly to reduce overlap with Belgian commercial fishing activity. Earlier iterations (2nd and 3rd) included small satellite boxes to the north and the south of the main site itself. These were removed for the draft final (and final) recommendations, as it emerged that they had been included based on relatively questionable ecological data. The development of the site through time can be seen on the below map.

# rMCZ 4- Iteration 1- Final Recommendations



# 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sand** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sand** in the biogeographic region are all **recovered**, such that the feature makes it contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (the feature is not currently exposed to pressures in *Italics)*<br>• Removal of non-target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Surface abrasion: damage to seabed surface features*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mixed Sediment** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and<br>• natural environmental processes*<br><br>Representative of **Subtidal Mixed Sediment** in the biogeographic region are all **recovered**, such that the feature makes it contribution to the network |
| **Advice on operations** | |
| 3<br>• Pressures | **Subtidal Mixed Sediment** is sensitive to the pressures: (the feature is not currently exposed to pressures in *Italics)*<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Removal of non-target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Removal of Target species<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Introduction of microbial pathogens (disease)*<br>• *Salinity changes - local*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Water clarity changes* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sands and Gravels** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sands and Gravels** in the biogeographic region are all **recovered**, such that the feature makes it contribution to the network |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sands and Gravels** is sensitive to the pressures: (the feature is not currently exposed to pressures in *Italics)*<br>• Removal of non-target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Coarse Sediment** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Coarse Sediment** in the biogeographic region are all or **recovered**, such that the feature makes it contribution to the network |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Coarse Sediment** is sensitive to the pressures: (the feature is not currently exposed to pressures in *Italics)*<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Physical change (to another seabed type)*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Moderate Energy Circalittoral Rock** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Moderate Energy Circalittoral Rock** in the biogeographic region are all **recovered**, such that the feature makes it contribution to the network |
| **Advice on operations** | |
| 3<br>Pressures | **Moderate Energy Circalittoral Rock** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Salinity changes - local*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water clarity changes*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

## 12. Sites to which this site is related

rMCZ 4 is placed between two other recommended MCZs in the Irish Sea Conservation Zone region, rMCZ 5 which is located 75 km (40 nm) to the south and rMCZ 3 which is located 88 km (47 nm) to the north. All three of these sites are offshore and have been recommended to protect the EUNIS level 2 habitat types, sublittoral sediment and circalittoral rock.

There are two Welsh marine Special Areas of Conservation (SACs) in the vicinity of rMCZ4 (vicinity being defined as less than 80 km). Lleyn Peninsula and the Sarnau, a marine SAC is within 50 km (27 nm) while the SAC in Cardigan Bay is 65 km (35 nm) away.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of moderate energy circalittoral rock | Combined biological and physical data were used to generate predictive habitat maps of the seabed | Connor et al. 2006, MESH project, Robinson et al. 2007 |
| Location of subtidal coarse sediment | Combined biological and physical data were used to generate predictive habitat maps of the seabed | Connor et al. 2006, MESH project, Robinson et al. 2007 |
| Location of subtidal sand | Combined biological and physical data were used to generate predictive habitat maps of the seabed | Connor et al. 2006, MESH project, Robinson et al. 2007 |
| Location of subtidal mixed sediments | Combined biological and physical data were used to generate predictive habitat maps of the seabed | Connor et al. 2006, MESH project, Robinson et al. 2007 |
| Location of subtidal sands and gravels | Combined biological and physical data were used to generate predictive habitat maps of the seabed | Connor et al. 2006, MESH project, Robinson et al. 2007 |

## 14. Stakeholder considerations

***Caveats:***

15. The MOD inert firing range within the site is assumed to be compatible with the benthic features for which the site is proposed for designation.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3.. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most stakeholders accepted the inclusion of rMCZ4 in the final network in order to satisfy the ENG targets. Conservation stakeholders in particular expressed strong support for inclusion of this site. Strong concerns were raised by the Belgian fishing interests on the understanding that they may lose fishing grounds in the far south of the site if it is designated.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

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# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT RMCZ 5 NORTH OF CELTIC DEEP

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 5 - North of Celtic Deep

## 2. Site centre location

52° 5' 27.139" N, 5° 38' 48.496" W
52.090871 Lat, -5.646804 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

655.69 $km^2$ (65567.33 ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

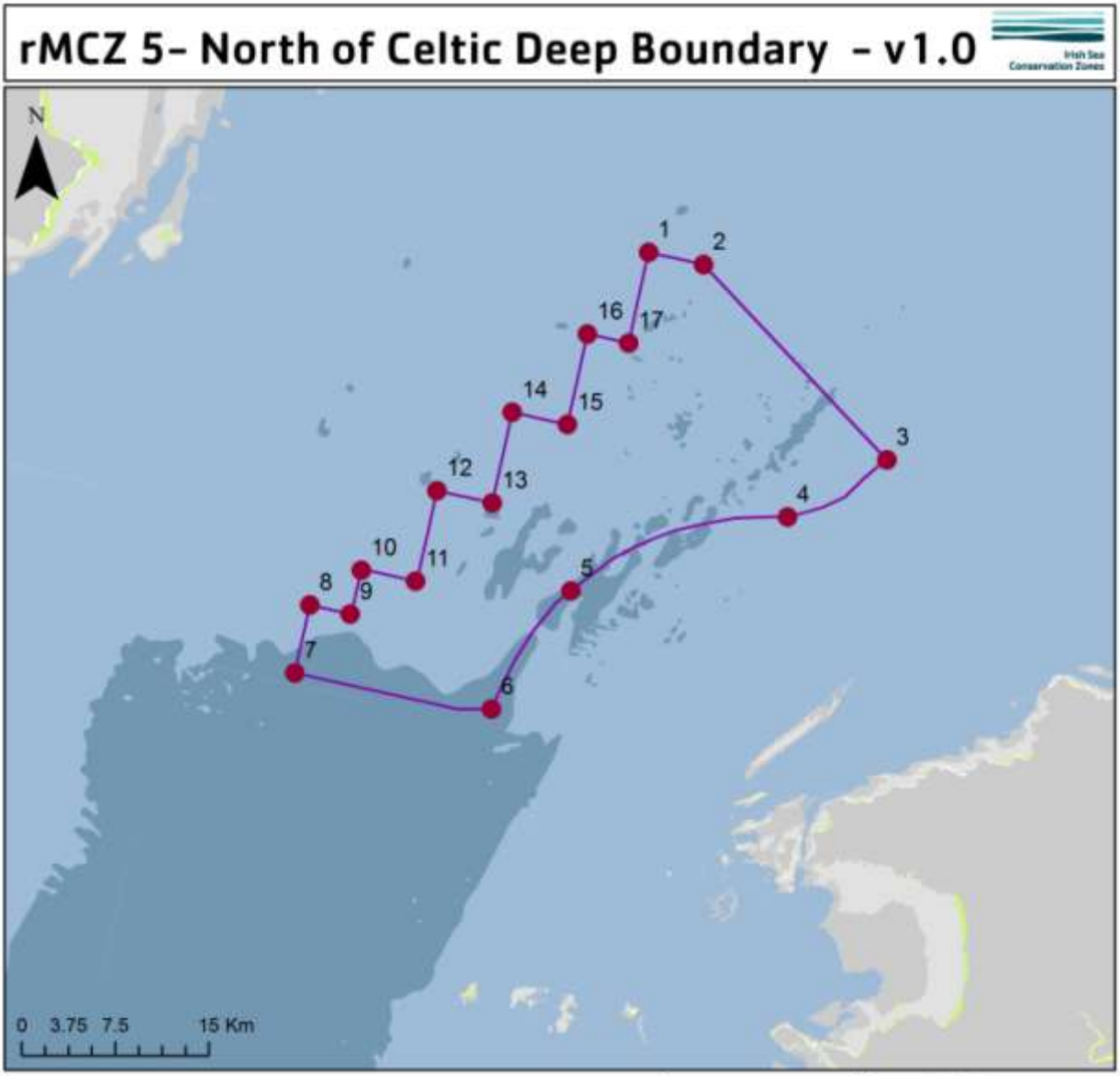
## 5. Features proposed for designation within rMCZ 5

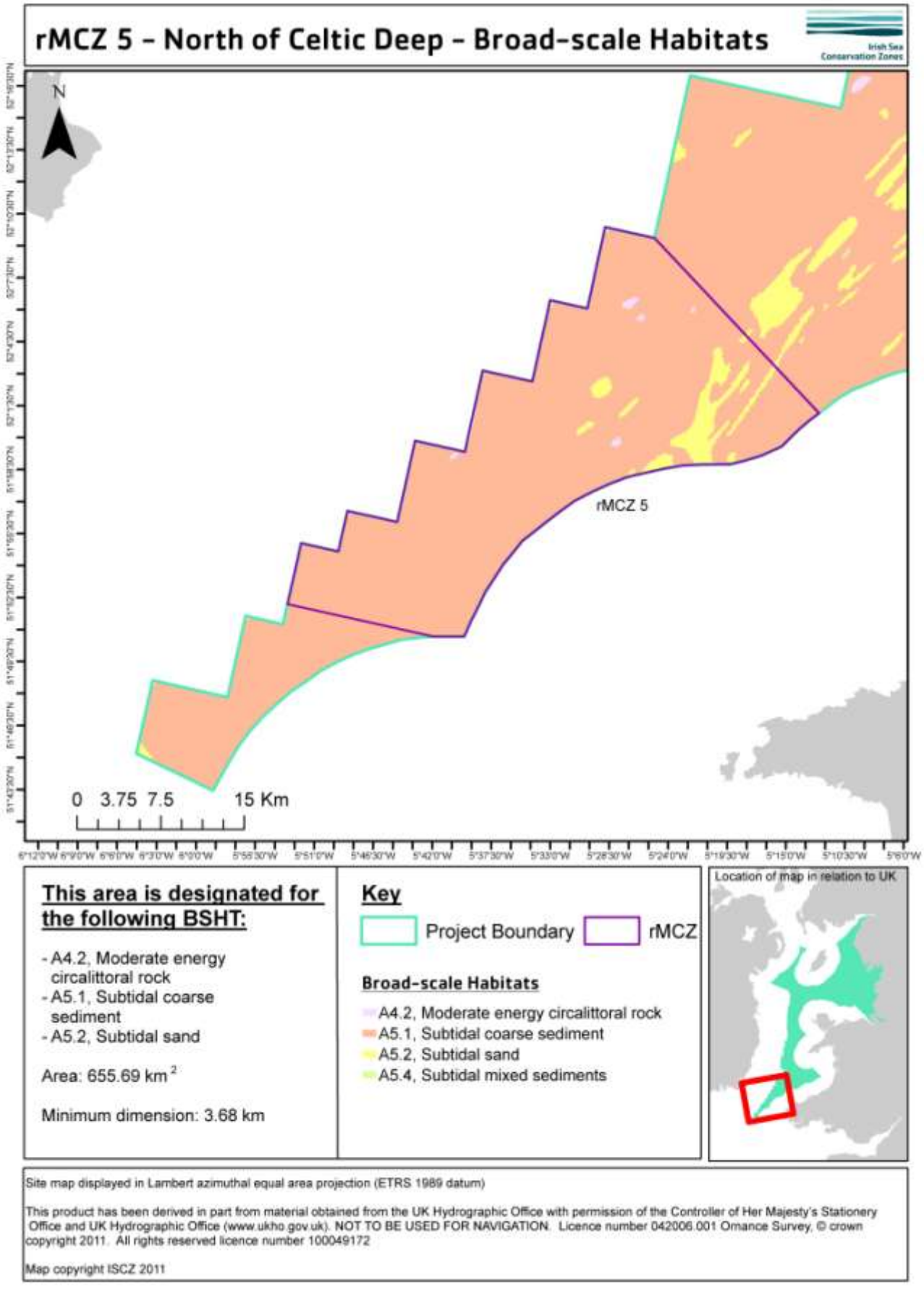
| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Broad scale habitat | A5.1 Subtidal coarse sediment<br>A5.2 Subtidal sand<br>A4.2 Moderate energy circalittoral rock | 616.88$km^2$ (61687.14 ha)<br>32.62$km^2$ (3261.82 ha)<br>2.33 $km^2$ (233.18 ha) |
| Habitat of conservation importance | Subtidal sands and gravels | 599.9 $km^2$ (59988.78 ha) |
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other features | n/a | |

## 6. Features within rMCZ 5 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | Horse mussel (*Modiolus modiolus)* beds | Insufficient confidence that the records of horse mussel represent horse mussel *beds*. |
| Species of conservation importance | Ocean quahog (*Arctica islandica)* | Insufficient confidence in the records. Known to breed in North Western region of the Irish Sea, therefore designated in rMCZ6.<br>There was also low stakeholder confidence in the quality of the Quahog data relating to the site. |

## 7. Map of site


rMCZ 5– North of Celtic Deep Boundary – v1.0
Irish Sea Conservation Zones
N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
0 3.75 7.5 15 Km
Bounding co-ordinates:
1: 52° 16' 0.001" N, 5° 39' 0.110" W
2: 52° 16' 0.001" N, 5° 35' 0.110" W
3: 52° 9' 26.492" N, 5° 19' 24.929" W
4: 52° 6' 7.884" N, 5° 25' 26.220" W
5: 52° 1' 1.848" N, 5° 39' 15.793" W
6: 51° 55' 18.869" N, 5° 42' 56.689" W
7: 51° 54' 59.906" N, 5° 57' 0.109" W
8: 51° 58' 0.000" N, 5° 57' 0.110" W
9: 51° 58' 0.001" N, 5° 54' 5.574" W
10: 51° 59' 56.669" N, 5° 54' 0.110" W
11: 52° 0' 0.000" N, 5° 50' 5.574" W
12: 52° 4' 0.000" N, 5° 50' 0.110" W
13: 52° 4' 0.000" N, 5° 46' 0.110" W
14: 52° 8' 0.000" N, 5° 46' 0.110" W
15: 52° 8' 0.001" N, 5° 42' 0.110" W
16: 52° 12' 0.001" N, 5° 42' 0.110" W
17: 52° 12' 0.001" N, 5° 39' 0.110" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 5 – North of Celtic Deep – Broad-scale Habitats
Irish Sea Conservation Zones
N
rMCZ 5
0 3.75 7.5 15 Km
This area is designated for the following BSHT:
- A4.2, Moderate energy circalittoral rock
- A5.1, Subtidal coarse sediment
- A5.2, Subtidal sand
Area: 655.69 km 2
Minimum dimension: 3.68 km
Key
Project Boundary
rMCZ
Broad-scale Habitats
A4.2, Moderate energy circalittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.4, Subtidal mixed sediments
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Omance Survey, © crown copyright 2011. All rights reserved licence number 100049172
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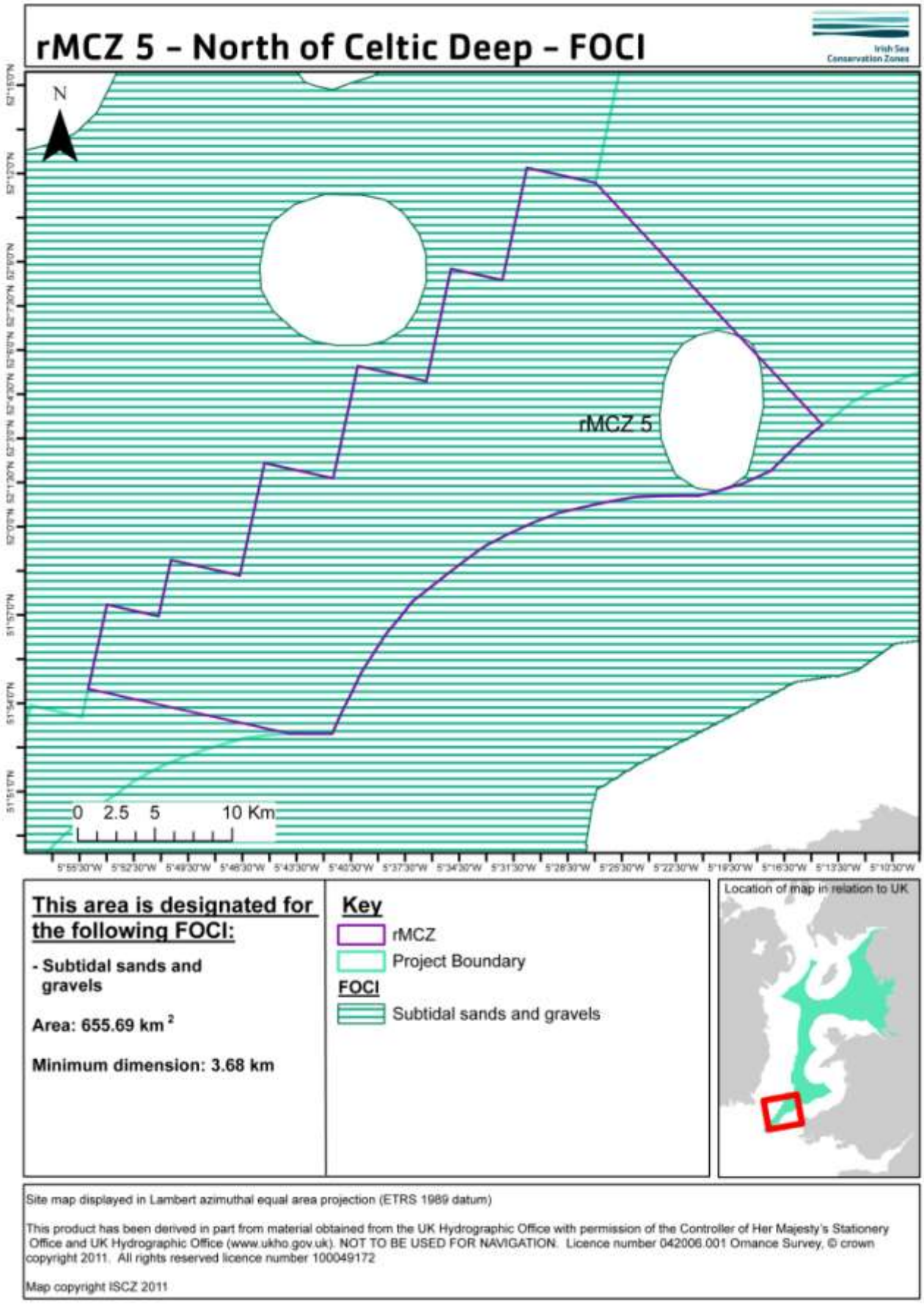


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

rMCZ5 is a large offshore site located between Welsh territorial waters and Republic of Ireland offshore waters. It is the most southerly site in the ISCZ project area, located 23 km (12 nm) from the Welsh coast. Extensive areas of subtidal coarse sediment are present throughout the site, in addition to moderate energy circalittoral rock and subtidal sand. rMCZ 5 includes part of St George's Channel, which is a deep (approximately 112 m) area that connects the Irish Sea to the Celtic Sea, through which water travels in from the Atlantic Ocean. The area is associated with high benthic diversity (Bolam et al. 2010) and high pelagic biological productivity due to thermal fronts that form in the summer months (Miller et al. 2010). The associated increase in abundance of pelagic food attracts top predators; the area is critical to the common dolphin *Delphinus delphis* (Clark et al. 2010) and is an important seabird foraging area (Smith et al. 2011).

## 9. Detailed site description

rMCZ5 is proposed for designation as an MCZ based on the presence of three broad-scale habitat types subtidal coarse sediment, subtidal sand and moderate energy circalittoral rock in an area of high productivity and benthic biodiversity.

A combination of physical and biological data has been used to identify the seabed habitat types within the site (UK Seamap, the Mapping European Seabed Habitat projects (MESH), and the HABMAP project). Aside from patches of bedrock and subtidal sand, the predominant marine habitat type is subtidal coarse sediment. Subtidal coarse sediment is a very common marine habitat type throughout the ISCZ project area, but there are three principle reasons why this site was prioritised for inclusion in the network.

First, the coarse sediment and subtidal sand found in the St. George's channel which is, in parts, greater than in 100 m depth, is rich in benthic diversity (Seeley et al. 2010). It is also an area of high abundance and biomass of marine invertebrate species (Bolam et al. 2010). Molluscs and annelids (for example, bivalves and worms) along with crustaceans are the main secondary producers around the area of rMCZ 5 (Bolam et al. 2010), which means these marine invertebrates are important for recycling organic matter from within the sediment and are key in linking energy between primary production in the plankton with predatory fish (Bolam et al. 2010).

Second, the area is of high biological productivity due to seasonal tidal mixing fronts (Miller et al. 2010). This is due to increased solar energy during spring which causes the warm, less dense water to sit on top of colder, denser deep water and their location depends on the water depth and the tidal mixing currents. The enhanced productivity results from mixing processes at fronts, which transfer additional nutrients from the mixed side into the surface layer of the stratified side (Miller pers. comm. 13th July 2011). This increase in temperature triggers an increase in biological productivity, similar to later on in the year when water cooling allows for nutrient rich deeper waters coming in from the Atlantic to mix with the surface waters (Brown et al. 2010). High biological productivity attracts top predators, including whales and dolphins which are protected under the Annex 1 of the EU Habitats directive. St George's Channel is a critical habitat for the short beaked common dolphin Delphinus delphis, where they congregate in large numbers (between May to November) for feeding and calving (Clark et al. 2010). Basking sharks Cetorhinus maximus are now marked as endangered on the International Union for conservation of Nature red list of

threatened species. Satellite tracking of these important species revealed that St. George's Channel was part of their migratory route (Stephan *et al.* 2011). These marine mammals and seabirds, for which this area provides important foraging grounds, provide evidence of the high biological productivity of the site.

Third, at the time of writing, the Irish national plans for marine protected areas are not yet in motion, and it seems likely that the Welsh MCZs will be placed within existing marine protected areas and therefore be restricted to inshore waters within 6 nm from the coast (Lindenbaum K. pers. comm. 24th March 2011). Therefore, rMCZ5, along with the more northerly sites rMCZ4 and 3 may offer the only offshore protection for these habitat types in the UK territorial waters of the Irish Sea.

The ocean quahog *Arctica islandica* has been recorded within rMCZ5 (Mackie 1995). The only known breeding population of quahogs in the Irish Sea is located much further north (in rMCZ 6), as the warmer seawater temperatures in recent years may not favour larval survival in the southern Irish Sea (P Butler, pers comm. 17th March 2011). However, given the longevity of the species and its importance as a scientific reference tool, the ocean quahog is noted as being present but not designated in this southerly site, rMCZ5.

There are records for horse mussels *Modiolus modiolus* a feature which has not proposed for designation in this site. There are numerous records of horse mussel from this site, but data are insufficient to suggest that these individual records support the presence of horse mussel beds. Rees (2009) indicated that the records of horse mussels south of the confirmed beds near the Lleyn Peninsula, are unlikely to represent beds. The records within rMCZ5 are more likely to be scattered populations of adults, records of juveniles, or another modiolus species (Rees 2009). On this basis, horse mussel beds have not been proposed for designation within rMCZ 5.

Site identification work was supported by knowledge and data for several important seabird species. rMCZ 5 is an important area for seabirds in the Irish Sea providing a foraging ground to a wide range of species, these include: gannets (*Morus bassanus*), Manx shearwaters (*Puffinus puffinus*) and puffins (*Fratercula arctica*). These birds can have significant foraging radii (the gannet can travel up to 300 km) and will originate from Welsh and Irish colonies, in particular Cardigan Bay and rocky cliffs on the east coast of Ireland (Gouldstone pers comm. 2011).

RSPB data incorporated in the Areas of Additional Ecological Importance GIS layer shows that the whole site, with its rich sandy sediments and high energy environment, is heavily used by a number of species. Locally puffins (*Fratercula arctica*) feed on sandeel and capelin; gannets (*Morus bassanus*) feed on mackerel, herring and sandeel; Manx shearwaters (*Puffinus puffinus*) feed on herring, sprat, whitebait and pilchards (Gouldstone pers comm. 2011).

## 10. Site boundary

This site has changed relatively little, in terms of position, throughout the process. The east and west boundaries of rMCZ5 abut onto the adjacent Welsh territorial limits and the median line between UK and the Republic of Ireland offshore waters. This will allow potential linkage to any future marine protected areas in adjacent waters, if this is deemed suitable. The site was located in this position to avoid the key (largely UK) fishing grounds in the Irish Sea and to ensure some connectivity between the ISCZ and the Finding Sanctuary MCZ networks. The southern boundary line originally (1st, 2nd and 3rd iteration) extended

further south in the project area but this was moved further north in the draft final recommendations, to the 51°55'N line, to allow fishery access. This reduction in size (and the location of the northern boundary limit (between 51°54'N, 5°35'W and 52° 9'26"N, 5°19' 24"W) is particularly important for Belgian beam trawlers, who work in this area before travelling further north in Irish Sea to access fishing grounds around Liverpool Bay and to the southwest of the Isle of Man. The development of the site boundary through time is shown on the below map.

## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sand** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sand** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature is not currently exposed to pressure in *Italics*)<br>• Removal of non-target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, recreation, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sands and Gravels** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity<br>• community structure<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Sands and Gravels** in the biogeographic region are all recovered, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sands and Gravels** is sensitive to the pressures:(The feature is not currently exposed to pressure in *Italics*)<br>• Removal of non-target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, recreation, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Coarse Sediment** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Coarse Sediment** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Coarse Sediment** is sensitive to the pressures: (feature is not currently exposed to pressure in *Italics*)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Physical change (to another seabed type)*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, recreation, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Moderate Energy Circalittoral Rock** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Moderate Energy Circalittoral Rock** in the biogeographic region are or **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Moderate Energy Circalittoral Rock** is sensitive to the pressures: (feature is not currently exposed to pressure in *Italics*)<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Salinity changes - local*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water clarity changes*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, recreation, transit of vessels and other fisheries. |

## 12. Sites to which this site is related

rMCZ 5 is located 75 km (40 nm) from rMCZ 4, another recommended MCZ within the ISCZ project area which has also been suggested for designation of the same EUNIS level 2 habitat type, subtidal sediment. As this zone is in the southern part of the project area, the nearest neighbouring site is the Celtic Deep rMCZ in the Finding Sanctuary project area. Celtic Deep is located 66 km (36 nm) from rMCZ 5, while East of Celtic Deep is 46 km (25 nm) away. These two sites which are both recommended for designation as MCZs, contain the same EUNIS level 2 habitat type, A5 subtidal sediment.

There are various Welsh and Irish marine Special Areas of Conservation (SACs) in the vicinity of rMCZ5 (vicinity being defined here as less than 80 km (43 nm)). Carnsore Point (designated for Annex 1 reef habitat) and Long Bank are within 40 km (21 nm) of the western edge of rMCZ5. Within 40 km of the Welsh side of the site is the Pembrokeshire marine SAC, Cardigan Bay marine SAC, St Davids (an island and cliff designated SAC, which is an important area for seabirds and breeding grey seals) and Skokholm and Skower Special Area of Protection (SPA).

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of moderate energy circa-littoral rock | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007) |
| Location of subtidal coarse sediment | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007) |
| Location of subtidal sand | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007) |

## 14. Stakeholder considerations

***Caveats:***
There are no specific caveats associated with this site.

***Implications:***
Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***
Most stakeholders accepted the inclusion of rMCZ5 in the final network in order to satisfy the ENG targets. Conservation stakeholders expressed strong support for inclusion of this site. Strong concerns were raised

on behalf of the French fishing interests, on the understanding that they may lose fishing grounds if the site is designated.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References


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WILSON, J.G., MACKIE, A.S.Y., O'CONNOR, B.D.S., REES, E.I.S. & DARBYSHIRE, T.2001. *Benthic biodiversity in the southern Irish Sea 2: The South-West Irish Sea Survey.*Studies in marine Biodiversity and Systematics from the National Museum of Wales.BIOMÔR Rep 2(1).

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 6 SOUTH RIGG

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 6 - South Rigg (zone includes recommended reference area F)

## 2. Site centre location

rMCZ 6:
54° 23' 8.974" N , 5° 0' 5.536" W
54.385826 Lat, -5.001537 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA F:
54° 24' 43.772" N, 4° 54' 13.501" W
54.412158 Lat, -4.90375 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

146.2 $Km^2$ (14619.87 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

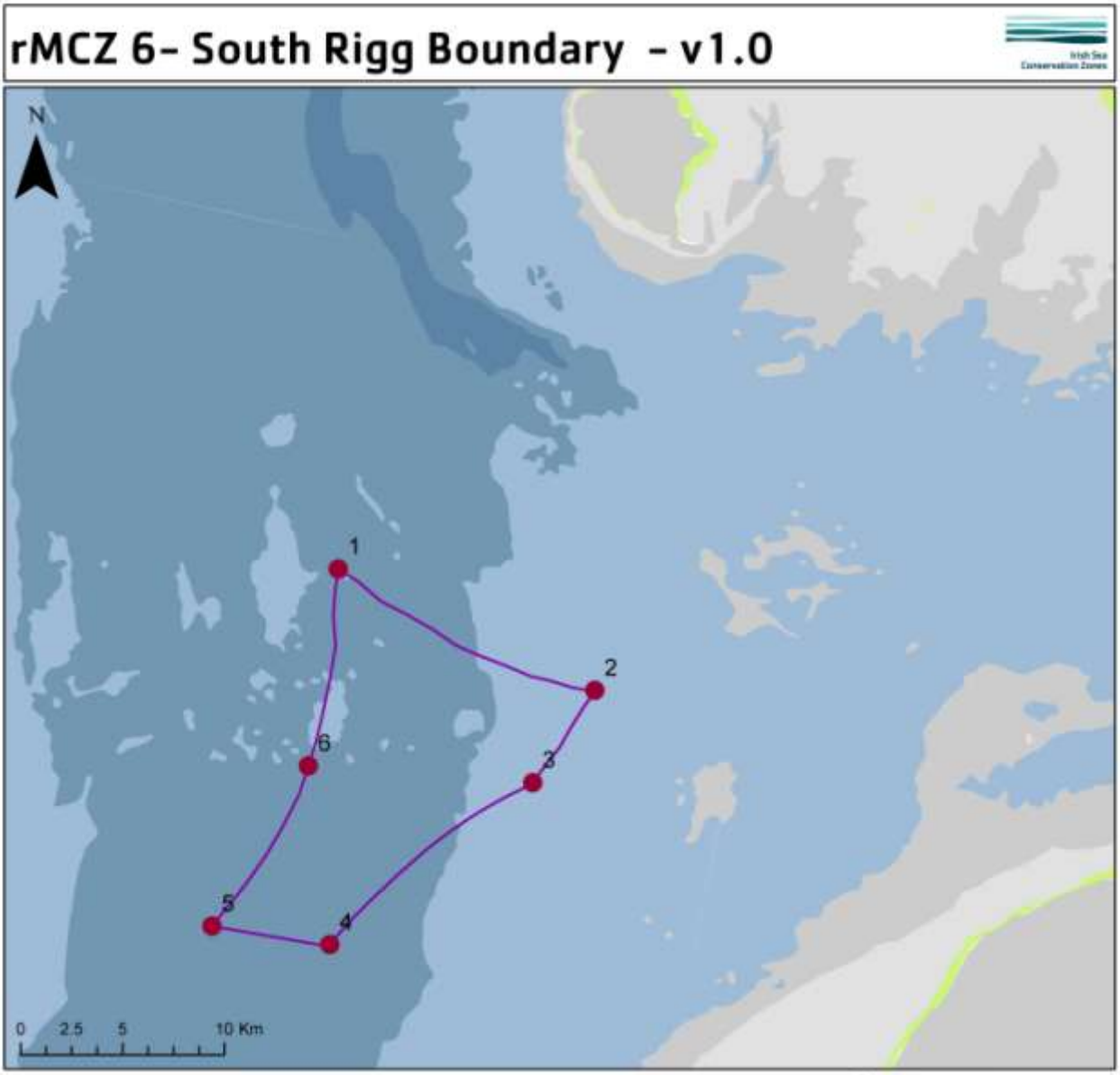
## 5. Features proposed for designation within rMCZ 6

| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A4.3 Low energy circalittoral rock<br>A5.2 Subtidal sand<br>A5.3 Subtidal mud | 21.09 $Km^2$ (2108.82 Ha)<br>28.83 $Km^2$ (2883.39 Ha)<br>96.28 $km^2$ (9627.63 Ha) |
| Habitat of conservation importance | Mud habitats in deep water<br>Sea-pen and burrowing megafauna communities | 42.09 $Km^2$ (4209.05 ha)<br>- |
| Species of conservation importance | Ocean quahog *Arctica islandica* | - |
| Geological feature | | |
| Other feature | | |

## 6. Features within rMCZ 6 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Map of site




Bounding co-ordinates:

1: 54° 27' 54.698" N, 5° 4' 33.222" W
2: 54° 26' 10.713" N, 4° 51' 56.999" W
3: 54° 23' 27.527" N, 4° 53' 50.836" W
4: 54° 18' 10.027" N, 5° 1' 19.921" W
5: 54° 17' 59.778" N, 5° 6' 44.682" W
6: 54° 22' 39.954" N, 5° 3' 59.688" W

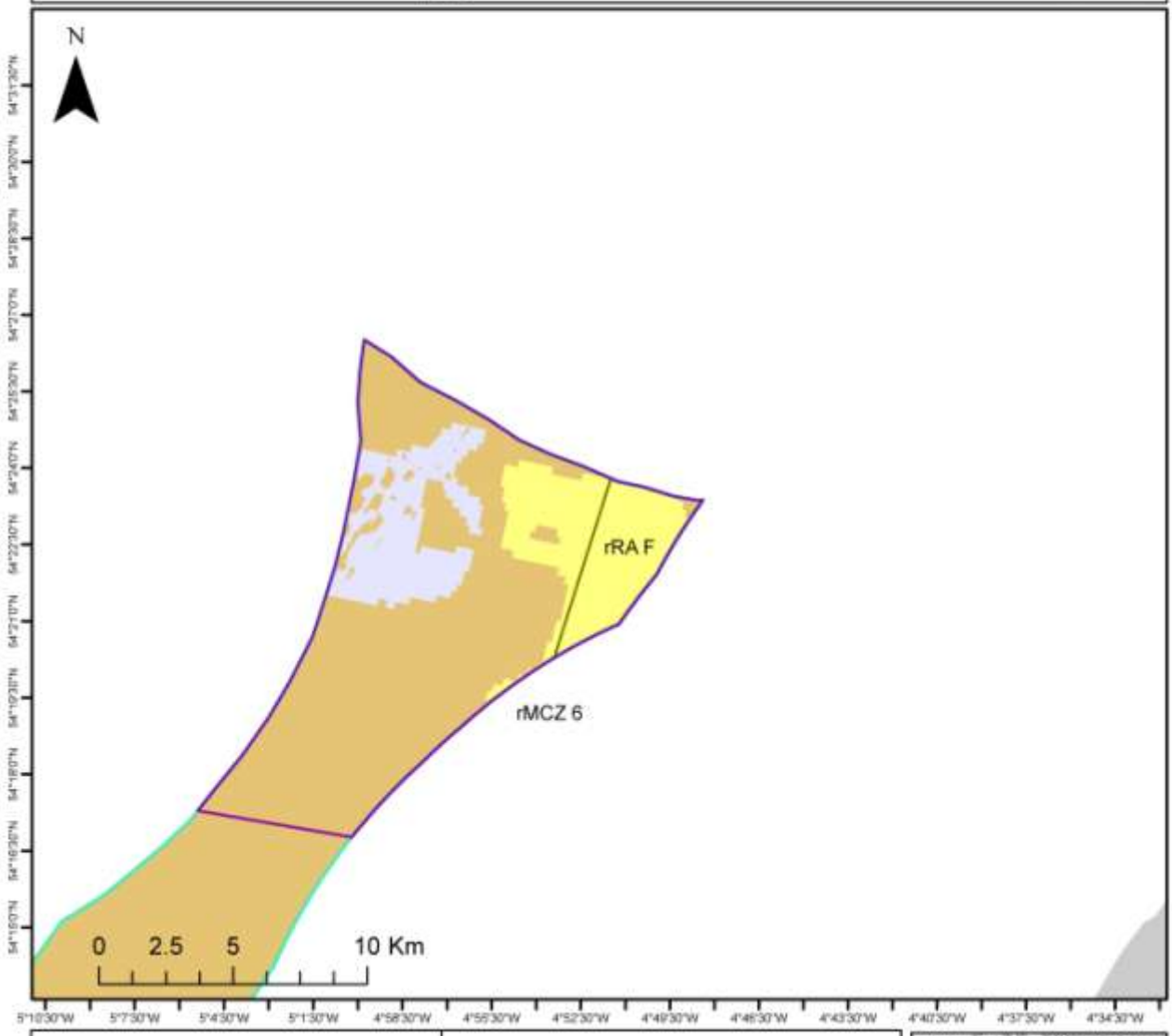
**Legend**

**Depth (m)**

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

# rMCZ 6 – South Rigg – Broad-scale Habitats




**This area is designated for the following BSHT:**

- A4.3, Low energy circalittoral rock
- A5.2, Subtidal sand
- A5.3, Subtidal mud

Area: 146.20 km$^2$

Minimum dimension: 5.82 km

**Key**

rRA  Project Boundary

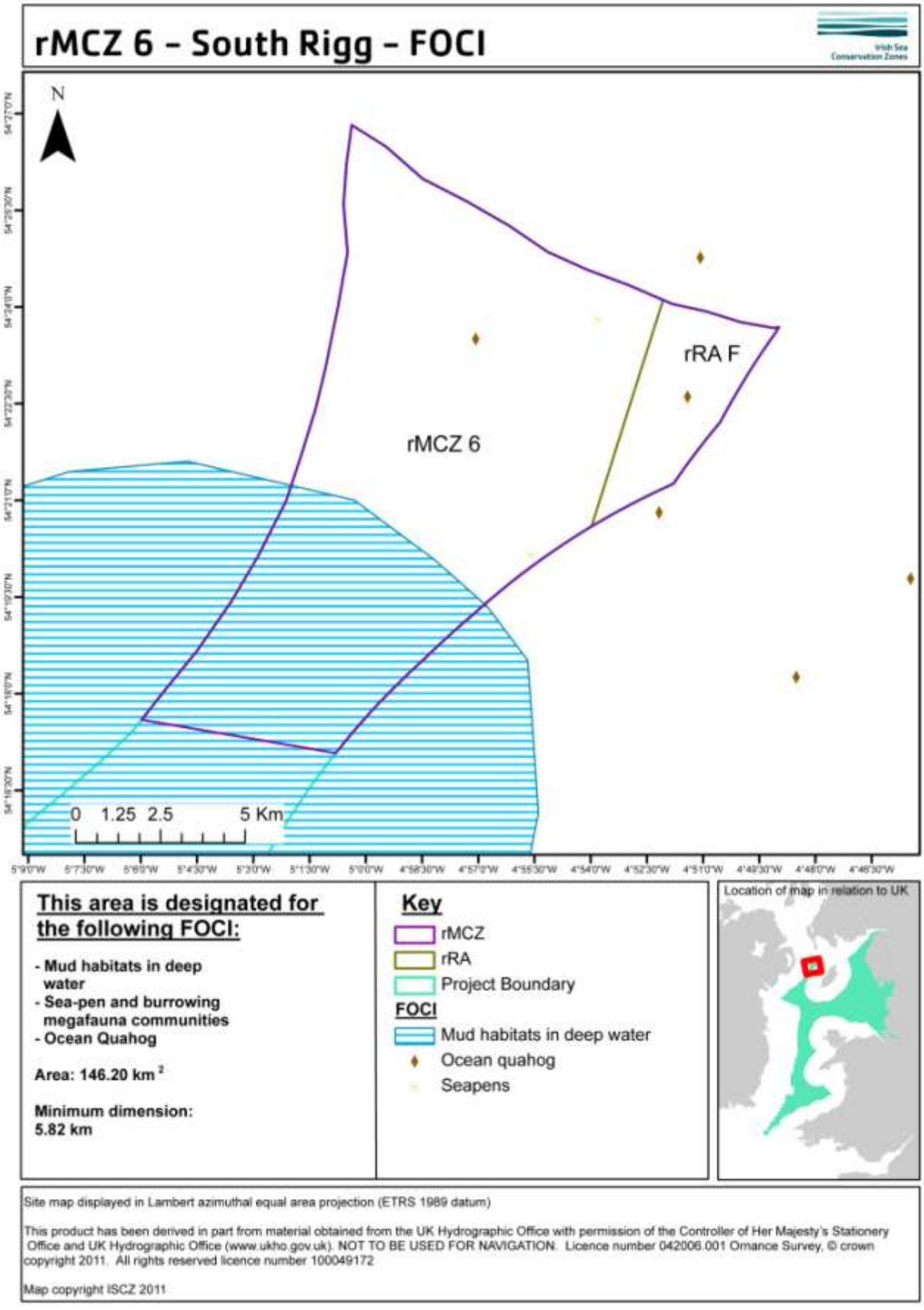
rMCZ

**Broad-scale Habitats**

A5.3, Subtidal mud
A5.2, Subtidal sand
A4.3, Low energy circalittoral rock

Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)




## This area is designated for the following FOCI:

- **Mud habitats in deep water**
- **Sea-pen and burrowing megafauna communities**
- **Ocean Quahog**

**Area: 146.20 km²**

**Minimum dimension: 5.82 km**

**Key**

- rMCZ
- rRA
- Project Boundary

**FOCI**

- Mud habitats in deep water
- Ocean quahog
- Seapens

Location of map in relation to UK



Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

rMCZ 6 is located in the western Irish Sea between three different territorial seas - northern Irish waters to the west, Scottish waters to the north and the Isle of Man waters to the east. The depth of the seabed in the site ranges from 50 to 150 m.

The zone contains the NW Irish Sea mounds, an area in which the habitat has been mapped using models based on acoustic surveys that were subject to ground truthing through a combination of multibeam sonar, grab samples and towed video surveys (Mellor et al. 2008). This area contains seapens (specifically the slender seapen) and burrowing megafauna, such as the mud burrowing shrimp *Callianassa* sp, the commercially important Dublin Bay prawn *Nephrops norvegicus* and the heart urchin *Brissopsis lyrifera* (Briggs et al. 2010, Marine Institute/AFBI unpublished data).

Adjacent to this area of reef and subtidal mud is the most northerly patch of subtidal sand in the ISCZ project area. The ocean quahog, *Arctica islandica* occurs in this area of subtidal sand (Butler 2009). Live juveniles have been recorded within rMCZ6 and are indicative of a breeding population (Butler pers comm. 17th March 2011). rMCZ6 therefore represents the only region of breeding quahogs within the Irish Sea Conservation Zone project area.

## 9. Detailed site description

rMCZ6 is located in the north-west of the Irish Sea. The site overlaps with the North West Irish Sea Mounds, an area known to contain bedrock outcrops, or reef habitat which is listed as an Annex 1 feature in the Habitats Directive.

The habitat data for this site stems from the MESH project (Mapping European Seabed Habitats) which includes a JNCC commissioned survey, undertaken by the AFBI (Agri-Food and Biosciences), to ground truth habitat maps with grab and towed video surveys to sample the biological community (Mellor et al. 2008).

Amongst the rocky outcrops in rMCZ6 are areas of soft sediment. The rock outcrops themselves are associated with an abundance of the sea anemone *Utricina eques*, brittle stars and hydroids plus bryzoan turf (Mellor et al. 2008). Between the bedrock outcrops are areas of soft sediments which were dominated by burrowing *Nephrops* and tube worms. The annual AFBI and Marine Institute stock assessment surveys for *Nephrops norvegicus* for the ICES Working Group has collected slender sea pens *Virgularia mirabilis* alongside the heart urchin *Brissopsis lyrifera* and the burrowing mud shrimp *Callianassa* sp. These data confirm the presence of the FOCI habitats of seapens and burrowing megafauna, as well as mud habitats in deep water (Briggs et al. 2010, Marine Institute/AFBI unpublished data).

The habitat types mapped in the zone were a source of disagreement amongst the Regional Stakeholder Group. This is perhaps unsurprising given that a study over the Pisces Reef (located to the south of rMCZ6 - within rMCZ 7) and the JNCC commissioned survey over the Northwest Irish Sea Mounds both noted that, due to the low energy depositional conditions, a veneer of sediment covered the mapped areas of bedrock. Callaway et al. (2009) indicated that had these surveys not taken the multi-disciplinary approach of combining video, acoustic and biological survey techniques when surveying the Pisces reef, the area would

have been misclassified as a purely rocky area, without accounting for the soft mud habitat and the associated biological communities. The general consensus within the RSG was that the predominant habitat type present in rMCZ6 was subtidal mud, based on the understanding (and evidence) of *Nephrops* trawling in the area, in addition to the smaller areas of subtidal sands and bedrock. In response to this, the project team reclassified the transitional broad-scale habitat of subtidal coarse sediments that were originally present in the habitat mapping data (MESH). The project team believe this re-classification is justified based on the towed video survey data from the northwest Irish Sea mounds which found that the majority of the areas of coarse sediment were taken from areas of infill on top of the bedrock outcrop (Mellor et al. 2008).

With the exception of localised areas around the bedrock, there are slow tidal currents around rMCZ6 (and in this area in general: 0.3 $ms^{-1}$, compared to 1 $ms^{-1}$ in the Eastern Irish Sea; Horsburgh et al. 2000). These deep water, low energy conditions lead to a seasonal stratification in the water column, where during spring and summer there is not enough tidal energy to vertically mix the cold deep water with the warmer surface waters (Brown et al. 2000). This results in a density driven cyclonic gyre (i.e. a vortex or rotating body of water) during summer and spring, which physically entrains *Nephrops* and pelagic juvenile fish larvae within the western Irish Sea gyre (Horsburgh et al. 2000).

In the northeast corner of rMCZ6 is an area of subtidal sand where the ocean quahog *Arctica islandica* has been recorded (Butler, 2009). The ocean quahog is a long-lived bivalve which, like trees, deposits an annual growth ring, the width of which can be used as a proxy for environmental conditions. Its shell material is an important palaeoclimatic tool that can be used to study the history of changes in sea temperature and other marine environmental variables on multi-centennial timescales (Butler 2009). In addition, breeding populations of quahogs are not generally found in the Irish Sea (possibly because the warmer seawater temperatures in recent years do not favour larval survival). Juvenile quahogs have, however, been collected in the subtidal sand patch within rMCZ6, making this possibly the only breeding population of this important species remaining in the ISCZ project area (P Butler, pers comm. 17th March 2011).

Site identification work was supported by knowledge and data for several important seabird species. rMCZ 6 is an important area for seabirds in the Irish Sea providing a foraging ground to a wide range of species. These include: guillemots (*Uria aalge*), gannets (*Morus bassanus*), Manx shearwaters (*Puffinus puffinus*) razorbill (*Alca torda*) and puffins (*Fratercula arctica*). These birds can have significant foraging radii (the gannet can travel up to 300 km) and will originate from Manx (Isle of Man) and Irish colonies (Gouldstone pers comm. 2011).

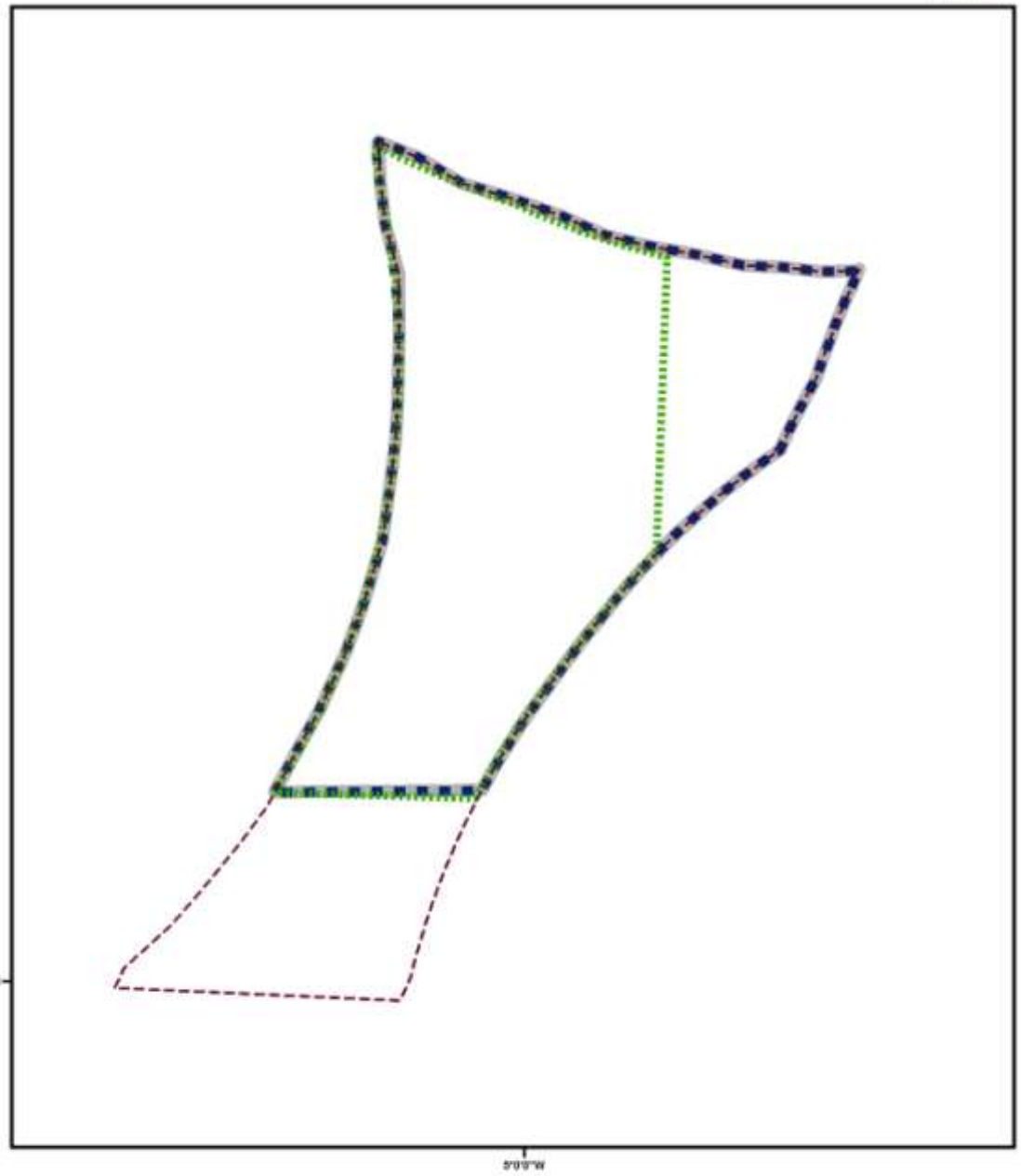
RSPB data incorporated in the Areas of Aditional Ecological Importance GIS layer shows that the whole of the site, with its mix of mud, sand and rocky habitats, and also containing a productive pelagic front, is heavily used by a number of species. Locally, guillemots (*Uria aalge*) feed on sandeel, herring and sprat; puffins (*Fratercula arctica*) feed on sandeel and capelin; gannets (*Morus bassanus*) feed on mackerel, herring and sandeel; Manx shearwaters (*Puffinus puffinus*) feed on herring, sprat, whitebait and pilchards; razorbill (*Alca torda*) feed on sandeel, herring and sprat (Gouldstone pers comm. 2011).

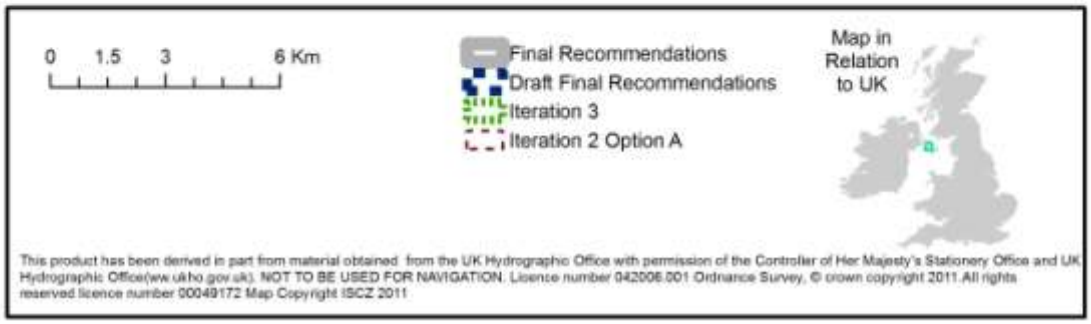
## 10. Site boundary

The site was originally identified for the presence of the Northwest Sea mounds and the associated Annex 1 reef habitat (and low energy circalittoral rock broad-scale habitat). The boundary was extended to meet the boundaries of the neighbouring Isle of Man, Northern Irish and Scottish waters as well as contributing

to the ENG target for subtidal mud. During the course of the 3rd iteration, the boundary to the east was altered to remove the patch of subtidal sand which the scallop fishers from the Isle of Man occasionally access. In light of the Ocean quahog data that was made available before the draft final recommendations, the boundary was revised so that the eastern edge of the rMCZ6 aligned once again with the Isle of Man territorial waters. Preliminary discussions are underway between Defra and the Isle of Man government to investigate the possibility of an Isle of Man marine protected area in the subtidal sand patch that would abut onto rMCZ6. The development of the site boundary through the process is shown on the below map.

# rMCZ 6- Iteration 1- Final Recommendations



## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mud** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Subtidal Mud** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Mud** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Surface abrasion: damage to seabed surface features*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Mud Habitats in Deep Water** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Mud Habitats in Deep Water** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Mud Habitats in Deep Water** is sensitive to the pressures :(feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Sand** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Subtidal Sand** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Sea-pens and Burrowing Mega Fauna Communities** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of the **Sea-pens and Burrowing Mega Fauna Communities** in the biogeographic region are all **recovered ,** such that the feature makes its contribution to the network |
| **Advice on operations** | |
| 3<br>Pressures | **Sea-pens and Burrowing Mega Fauna Communities** are sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Physical change (to another seabed type)<br>• Siltation rate changes (high)<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Organic enrichment*<br>• *Structural abrasion/penetration: Structural damage to seabed <25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Salinity changes - local*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Low Energy Circalittoral Rock** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Low Energy Circalittoral Rock** in the biogeographic region are all **recovered** such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Low Energy Circalittoral Rock** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Water clarity changes*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Ocean Quahog (*Arctica islandica*)** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Ocean Quahog (*Arctica islandica*)** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Ocean Quahog (*Arctica islandica*)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling and scallop/queenie dredging. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

## 12. Sites to which this site is related

rMCZ 6 is approximately 26 km away from rMCZ 7 which is another site that has been recommended for designation for the same EUNIS level 2 habitat types, sublittoral sediment and sublittoral rock. There are a number of existing protected areas with marine components which fall within the vicinity of rMCZ6. Within 50 km on the northern Ireland side of rMCZ6 are the conservation areas with marine feature designations: Murlough (sea inlets), Strangford Lough (reefs and intertidal mud), Killough (SPA), Outer Ards (SPA, intertidal mud), Copeland Islands (SPA). Within 40 km of the Scottish boundary of rMCZ6 is the Mull of Galloway (SSSI including maritime cliffs). Within 80 km of the site is Luce Bay and sands (a Scottish SAC with marine designations) and Loch Ken.

## 13. Supporting documentation

This section should include the sources of the best available scientific and stakeholder information used to identify sites and conservation objectives presented in a table format:

| **Information** | **Type of information** | **Source** |
|---|---|---|
| Location of Low energy circalittoral rock | Combined physical and biological surveying with habitat modelling | Robinson et al. 2007, Mellor et al 2008 |
| Location of subtidal sand | Combined physical and biological surveying with habitat modelling | Robinson et al. 2007, Mellor et al 2008 |
| Location of subtidal mud | Combined physical and biological surveying with habitat modelling | Robinson et al. 2007, Mellor et al 2008 |
| Location of mud habitats in deep water | Combined physical and biological surveying with habitat modelling | Robinson et al. 2007, Mellor et al 2008 |
| Location of sea-pen and burrowing megafauna communities | Video surveys and grab samples | Robinson et al. 2007, Mellor et al 2008 |
| Location of subtidal sands and gravels | | Robinson et al. 2007 |
| Location of ocean quahog *Arctica islandica* | | Butler 2009 |

## 14. Stakeholder considerations

***Caveats:***

16. The MOD expressed caution with regard to submarine activity (landing on sea floor) in this area, which would need to be allowed to continue.

***Implications:***
Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***
Most stakeholders accepted the inclusion of rMCZ6 in the final network in order to satisfy the ENG targets. Strong concerns were raised by the Northern Irish fishing fleet due to the likelihood of losing *Nephrops* fishing grounds, and by the Isle of Man fishing representative due to the likelihood of losing refuge scallop grounds.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References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ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

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MELLOR, A. MITCHELL, A., STRONG, J., ROONEY, L., SERVICE, M. 2008. *North West Irish Sea mounds: hard and soft substrate habitats*. JNCC Report No. 410. Contract Reference No: F90-01-942(8).

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ROBINSON, K., RAMSAY, K., WILSON, J., MACKIE A., WHEELER, A., O'BEIRN F., LINDENBAUM, C., VAN LANDEGHAM, K., MCBREEN, F., MITCHELL, N. 2007. *HABMAP:Habitat Mapping for conservation and management of the southern Irish Sea*. Report to the Welsh European Funding Office. CCW Science Report Number 810. Countryside Council for Wales, Bangor. 233 pp plus appendices.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 7 SLIEVE NA GRIDDLE

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ7 - Slieve Na Griddle (zone includes recommended reference area G)

## 2. Site centre location

rMCZ 7:
54° 10' 28.255" N, 5° 11' 0.769" W
54.174515 Lat, -5.183547 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA G:
54° 9' 38.429" N, 5° 15' 12.681" W
54.160674 Lat, -5.253522Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

57.79 $Km^2$ (5778.45 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

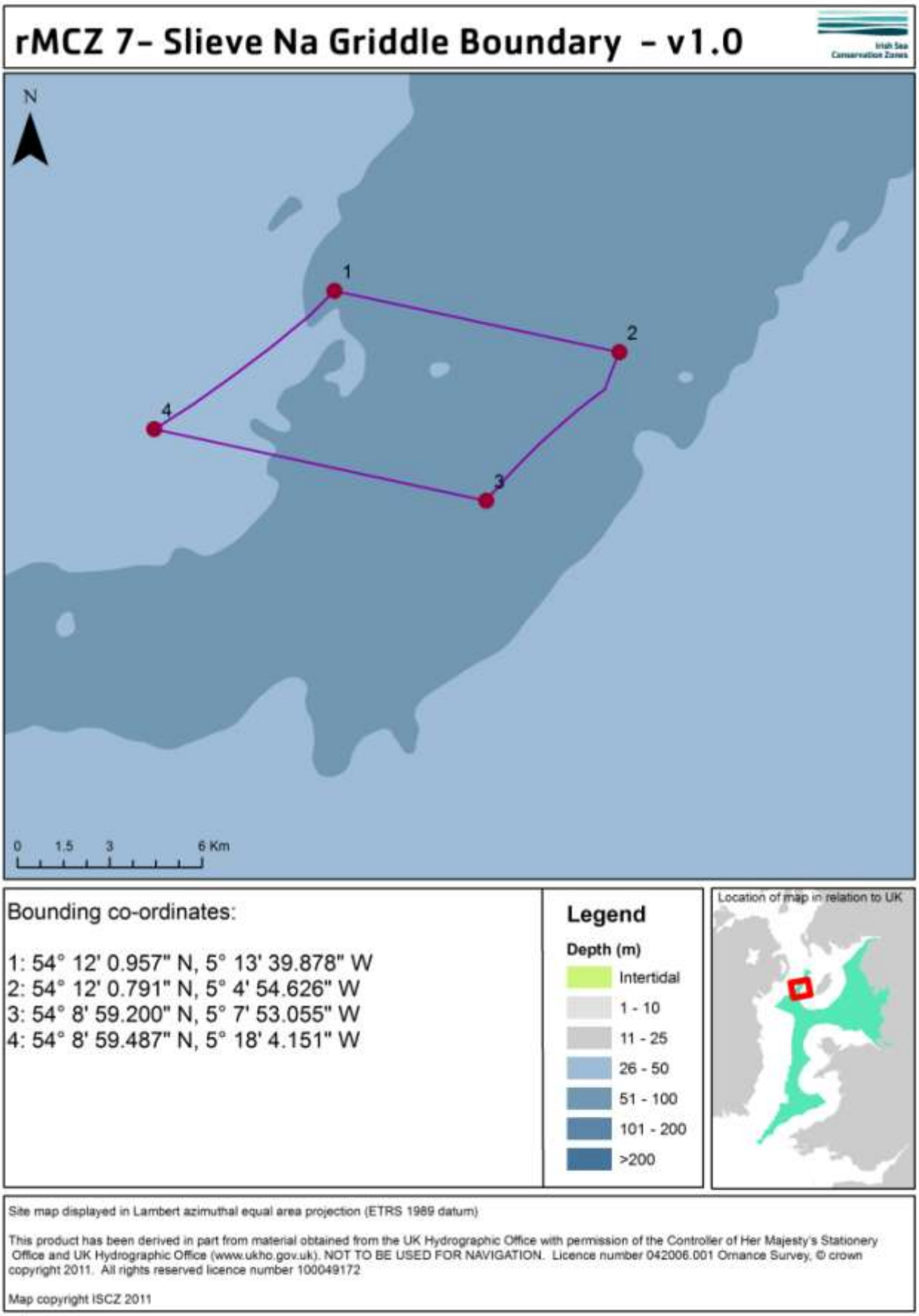
## 5. Features proposed for designation within rMCZ 7

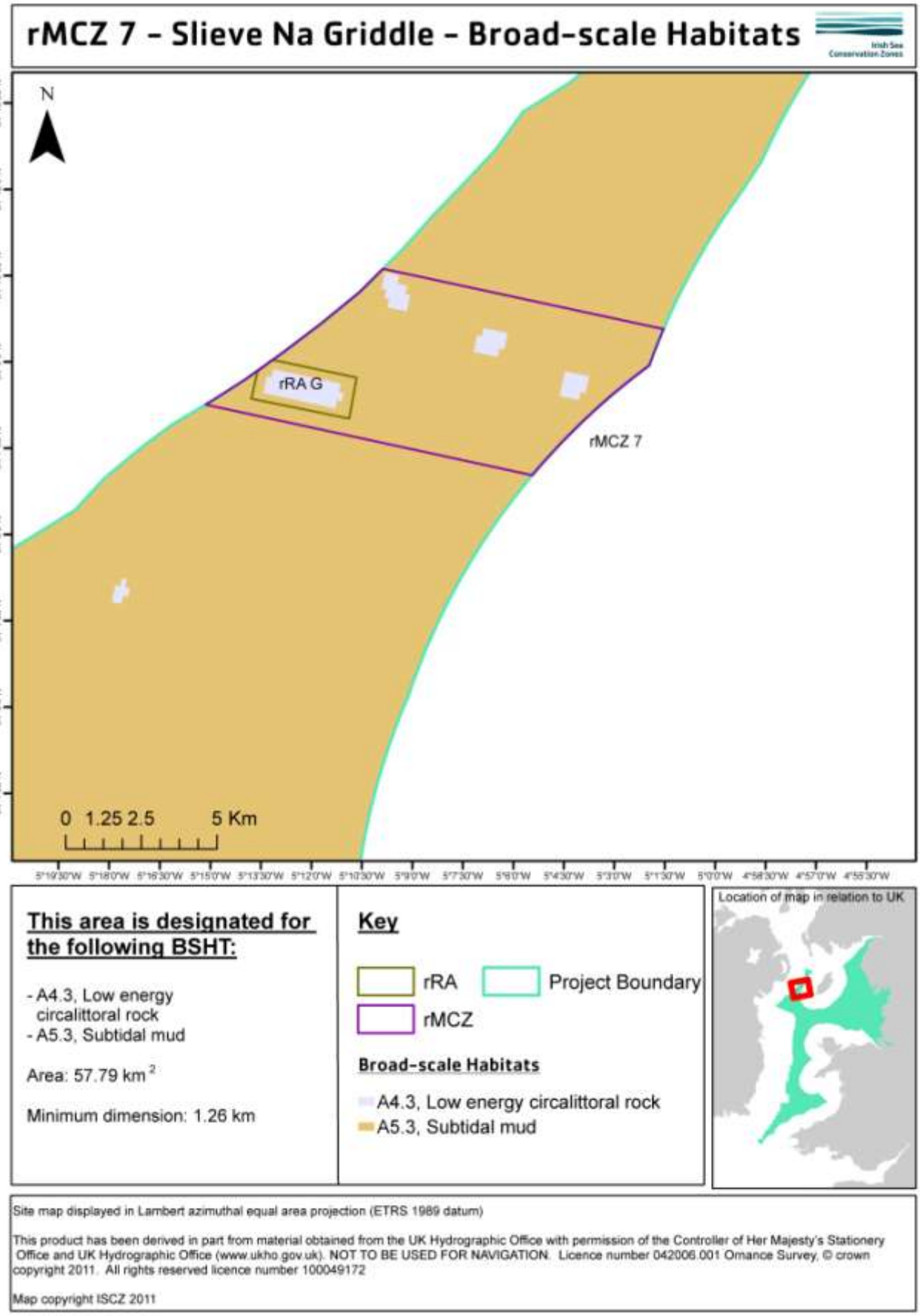
| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Broad scale habitat | A4.3 Low energy circalittoral rock<br>A5.3 Subtidal mud | 4.18 $Km^2$ (417.95 Ha)<br><br>53.34 $Km^2$ (5334.18 Ha) |
| Habitat of conservation importance | Mud habitats in deep water | 57.79 $Km^2$ (5778.45 Ha) |
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | | |

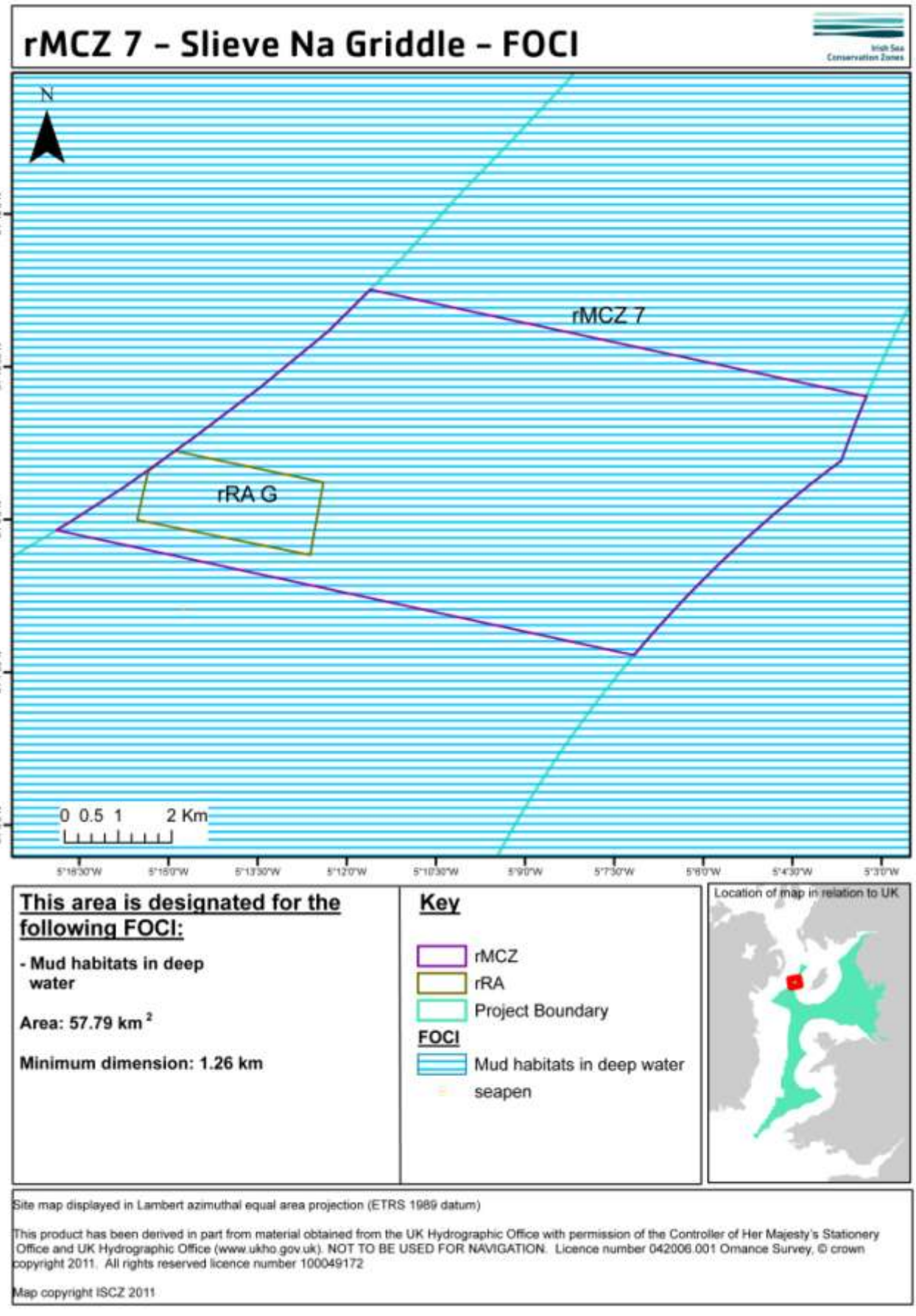
## 6. Features within rMCZ7 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Map of site


rMCZ 7– Slieve Na Griddle Boundary – v1.0
Irish Sea Conservation Zones
N
1
2
3
4
0 1.5 3 6 Km
Bounding co-ordinates:
1: 54° 12' 0.957" N, 5° 13' 39.878" W
2: 54° 12' 0.791" N, 5° 4' 54.626" W
3: 54° 8' 59.200" N, 5° 7' 53.055" W
4: 54° 8' 59.487" N, 5° 18' 4.151" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 7 – Slieve Na Griddle – Broad-scale Habitats
Irish Sea Conservation Zones
N
rRA G
rMCZ 7
0 1.25 2.5 5 Km
5°19'30"W 5°18'0"W 5°16'30"W 5°15'0"W 5°13'30"W 5°12'0"W 5°10'30"W 5°9'0"W 5°7'30"W 5°6'0"W 5°4'30"W 5°3'0"W 5°1'30"W 5°0'0"W 4°58'30"W 4°57'0"W 4°55'30"W
This area is designated for the following BSHT:
- A4.3, Low energy circalittoral rock
- A5.3, Subtidal mud
Area: 57.79 km 2
Minimum dimension: 1.26 km
Key
rRA
Project Boundary
rMCZ
Broad-scale Habitats
A4.3, Low energy circalittoral rock
A5.3, Subtidal mud
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 7 – Slieve Na Griddle – FOCI
Irish Sea Conservation Zones
N
rMCZ 7
rRA G
0 0.5 1 2 Km
54°12'0"N
54°10'30"N
54°9'0"N
54°7'30"N
54°6'0"N
5°18'30"W
5°15'0"W
5°13'30"W
5°12'0"W
5°10'30"W
5°9'0"W
5°7'30"W
5°6'0"W
5°4'30"W
5°3'0"W
This area is designated for the following FOCI:
- Mud habitats in deep water
Area: 57.79 km 2
Minimum dimension: 1.26 km
Key
rMCZ
rRA
Project Boundary
FOCI
Mud habitats in deep water
seapen
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

rMCZ7 is located in the western Irish Sea. This offshore site is situated between the northern Irish territorial waters to the west and the Isle of Man territorial waters to the east. Mud habitat and bedrock makes up the seabed in the site and the depth ranges from 70 m to 150 m. The Pisces reef complex is situated within the boundaries of rMCZ7. The Pisces reef qualifies as an Annex 1 Reef habitat according to the EU Habitats and Species Directive and has been formally recommended as a Special Area of Conservation (SAC) (JNCC 2011). The Pisces Reef is comprised of three bedrock pinnacles which rise 15-35 m up from the surrounding seabed, although not all of these are located within rMCZ7. The mud habitat present in rMCZ7 is part of the mud patch in the western Irish Sea. Low energy conditions in this area (Horsburgh et al. 2000) provide a stable environment, characteristic of mud habitats in deep water. The mud habitat in this region supports a thriving and commercially important *Neprhops norvegicus* or Dublin Bay Prawn fishery. Close to the Pisces Reef, the soft sediment in which the *Nephrops* burrow are inaccessible to traditional fishing methods and, as such, the reef provides a natural refuge from fishing pressure. Designation of an MCZ in this region may provide an additional buffer of reduced fishing activity in the mud habitat. This may have a potential positive impact for larval export outside of the site boundaries and also for the potential recovery of seapens, which have been recorded in the vicinity of the site.

## 9. Detailed site description

The zone includes areas of low energy circalittoral rock, namely the Pisces Reef complex (a proposed SAC) amidst deep water mud habitat.

The habitat data for this site is derived from the MESH project (Mapping European Seabed Habitats) which includes a JNCC commissioned survey, undertaken by AFBI (Agri-Food and Biosciences, Northern Ireland), to ground truth habitat maps with grab and towed video surveys to sample the biological community (JNCC 2007).

The area is a depositional environment for sediments with localised scouring around the bedrock and boulders that make up the reef (Callaway et al. 2009). Geophysical, video and biological grab samples have verified the presence of low energy circalittoral rock, or bedrock under a veneer of mud which was classified as fine mud dominated by burrowing megafauna and scoured mud dominated by polychaetes (Callaway et al. 2009). Callaway et al. (2009) noted that had video and acoustic data had been used alone, the area would have been misclassified as a purely rocky reef area, without accounting for the soft mud habitat covering the reef.

The Pisces Reef qualifies as Annex 1 Reef habitat according to the EU Habitats and Species Directive and has been formally recommended as a Special Area of Conservation (SAC) (JNCC 2011). It is comprised of three bedrock pinnacles which rise 15-35 m up from the surrounding seabed. The reefs support a diverse animal community, including hydroids (e.g *Diphasia nugra*), a range of sponges, including the cup sponge *Axinella infundibuliformi*, echinoderms, for example the cushion star fish *Porania pulvillus* and various crustaceans, for example the edible crab *Cancer pagurus* and squat lobster *Munida rugosa*. Additionally, the reef may provide shelter for juvenile fish, including blue whiting, bib, red gurnard and wrasse (Judd 2004).

The mud habitat present in rMCZ7 is part of the western Irish Sea mud belt. The best known burrowing marine invertebrate found in this deep water mud is the Dublin Bay prawn *Nephrops norvegicus*, for which there are valuable fishing grounds within this part of the project area. The western Irish Sea *Nephrops* population is larger (in number) than that in the eastern Irish Sea , which occurs on a separate mud belt to the east of the Isle of Man; the two populations are not thought to be connected in terms of larval distribution (Clements 2010). The *Nephrops* fishery is particularly important since the collapse and decline of cod and whiting fisheries in the region and, based on fishery independent video survey data (between 2003-2007), it appears that *Nephrops* burrows are decreasing in density (Clements 2010). There are, however, a whole host of other animals which inhabit deep water mud including the brittlestar *Amphiura chiajei* and the burrowing sea urchin *Brissopsis lyrifera* (Maddock 2010).

During submersible trials in the 1970s, scattered seapens were recorded in the soft sediments between rocky outcrops of the Pisces reef, but they are no longer present in the same abundance (JNCC 2011). More recently, incidental records of seapens have been noted during the ICES *Nephrops* stock assessment in an area close to the southern boundary of rMCZ7 (Marine Institute / AFBI, unpublished data). More recent records to confirm the presence of seapens are required for this habitat feature to be designated in this rMCZ, but it seems quite probable that, given time and a decrease in trawl activity, seapens may recover in this area.

Basking sharks *Cetorhinus maximus* are now marked as endangered on the International Union for Conservation of Nature red list of threatened species. Satellite tracking of these important species revealed that St. George's Channel was part of their migratory route (Stephan *et al.* 2011). It was found that the area is used significantly during the months of July to September utilising the nutrient rich stratified waters between the Isle of Man and Northern Ireland (Stephan *et al.* 2011). As such, whilst they are not features proposed for designation, they may benefit indirect protection as a result of designation of rMCZ 7.

## 10. Site boundary

rMCZ 7 was primarily identified as a site for a marine conservation zone based on the presence the Pisces reef complex which was in the process of being recommended as a Special Area of Conservation for Annex 1 reef habitat. The eastern and western boundaries were aligned with the devolved administrative boundaries of Northern Ireland and the Isle of Man, while the north, south boundary positions were reached at a comprise between covering the broad-scale habitat type, subtidal mud, whilst minimizing the loss of fishing grounds to the Northern Irish trawlers that target *Nephrops* in this area. More generally, a gap between rMCZs 6 and 7 was deliberately included so that fishing could continue between these two sites. This was felt to be more beneficial to the fishing industry than one large site.

## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Subtidal Mud** to favourable condition[by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of the **Subtidal Mud** in the biogeographic region are all **recovered**. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Mud** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Removal of target species (lethal)<br>• *Surface abrasion: damage to seabed surface features*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Mud Habitats in Deep Water** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of the **Mud Habitats in Deep Water** in the biogeographic region are all **recovered**. |
| **Advice on operations** | |
| 3<br>Pressures | **Mud Habitats in Deep Water** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Organic enrichment*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **recover** the **Low Energy Circalittoral Rock** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>Representative of **Low Energy Circalittoral Rock** in the biogeographic region are all **recovered**. |
| **Advice on operations** | |
| 3<br>Pressures | **Low Energy Circalittoral Rock** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• Surface abrasion: damage to seabed surface features<br>• *Removal of non-target species (lethal)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Water clarity changes*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (low)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, the human activities that require additional management are benthic trawling. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables and military activity. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels and other fisheries. |

## 12. Sites to which this site is related

rMCZ 7 is approximately 26 km away from rMCZ 6, which is another site that has been recommended for designation for the same EUNIS level 2 habitat types, sublittoral sediment and rock. The site itself overlaps with the Pisces Reef complex which has been recommended as a Special Area of Conservation (SAC). There are a number of existing protected areas with marine components which fall within the vicinity of rMCZ7. Within 40 km on the Northern Irish side of rMCZ7 are the following conservation areas with marine feature designations: Murlough (sea inlets), Strangford Lough (reefs and intertidal mud), Killough (SPA), Outer Ards (SPA, intertidal mud), Copeland Islands (SPA). With 40 km of the Scottish side of the site is the Mull of Galloway SSSI (including maritime cliffs). Within 80 km of the site is Luce Bay and sands (a Scottish SAC with marine designations) and Loch Ken.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of low energy circalittoral rock | Surveys (seabed imagery, acoustic, multibeam sonar, grab samples, video surveys) | Judd 2007 and AFBI 2007, referenced in JNCC 2011, Callaway et al. 2009. |
| Location of subtidal mud | Surveys (seabed imagery, acoustic, multibeam sonar, grab samples, video surveys) | Judd 2007 and AFBI 2007, referenced in JNCC 2011, Callaway et al. 2009. |
| Location of mud habitats in deep water | Surveys (seabed imagery, acoustic, multibeam sonar, grab samples, video surveys) | Judd 2007 and AFBI 2007, referenced in JNCC 2011, Callaway et al. 2009. |

## 14. Stakeholder considerations

***Caveats:***
There are no specific caveats associated with this site.

***Implications:***
Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***
Most stakeholders accepted the inclusion of rMCZ7 in the final network in order to satisfy the ENG targets. Strong concerns were raised by the Northern Irish fishing fleet due to the likelihood of losing *Nephrops* fishing grounds.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References


CLEMENTS, A.J. 2010. *Broad-scale ecological investigation of Nephrops norvegicus (L.) Burrow distribution in the Western Irish Sea*. Ph.D. Thesis, Queen's University Belfast.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

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JNCC. 2007. *North West Irish Sea mounds: hard and soft substrate habitats*. JNCC Contract Reference No: F90-01-942(8).

JNCC. 2011. *Offshore Special Area of Conservation: Pisces Reef Complex. SAC Selection Assessment.* Version 3.0 (17th January 2011).

CALLAWAY, A., SMYTH, J., BROWN, C.J., QUINN, R., SERVICE, M. & LONG, D. 2009. *The impact of scour processes on a smothered reef system in the Irish Sea.* Estuarine, Coastal and Shelf Science. 84: 409-418.

MADDOCK, A. 2010. UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant [Accessed 6 April 2011] http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsRevised20100730.pdf

STEPHAN, E,. GADENNE, H & JUNG, A. 2011. *Satellite tracking of basking sharks in the north-east Atlantic ocean.* NGO for study of conservation of Elasmobranchs. Available from: http://www.assc-apecs.org/programme-de-marquage-satellite.html

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 8 FYLDE OFFSHORE

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ8 - Fylde Offshore

## 2. Site centre location

53° 44' 48.519" N, 3° 13' 10.864" W
53.74681 Lat, -3.219684 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

260.27 $Km^2$ (2602.93 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

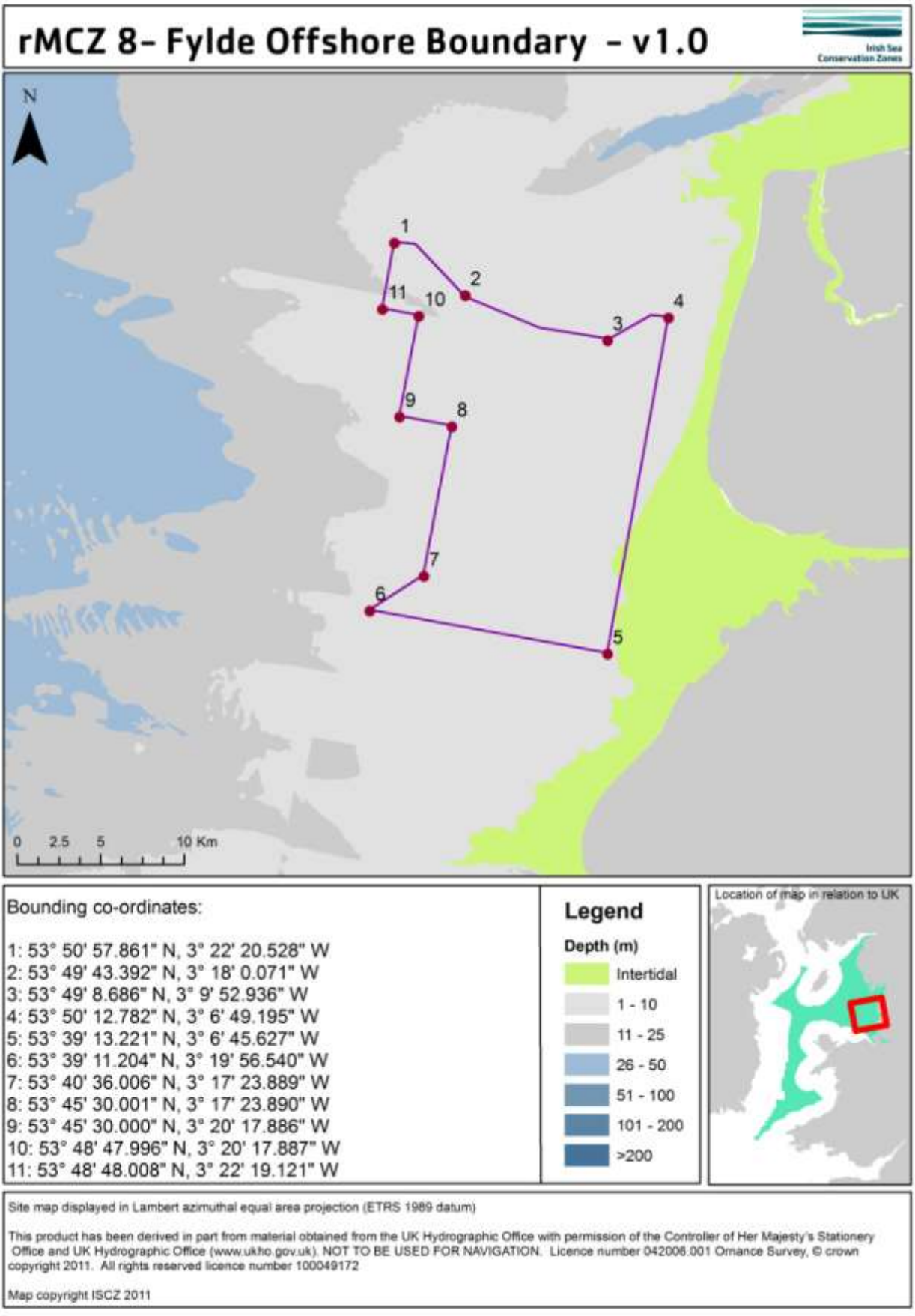
## 5. Features proposed for designation within rMCZ8

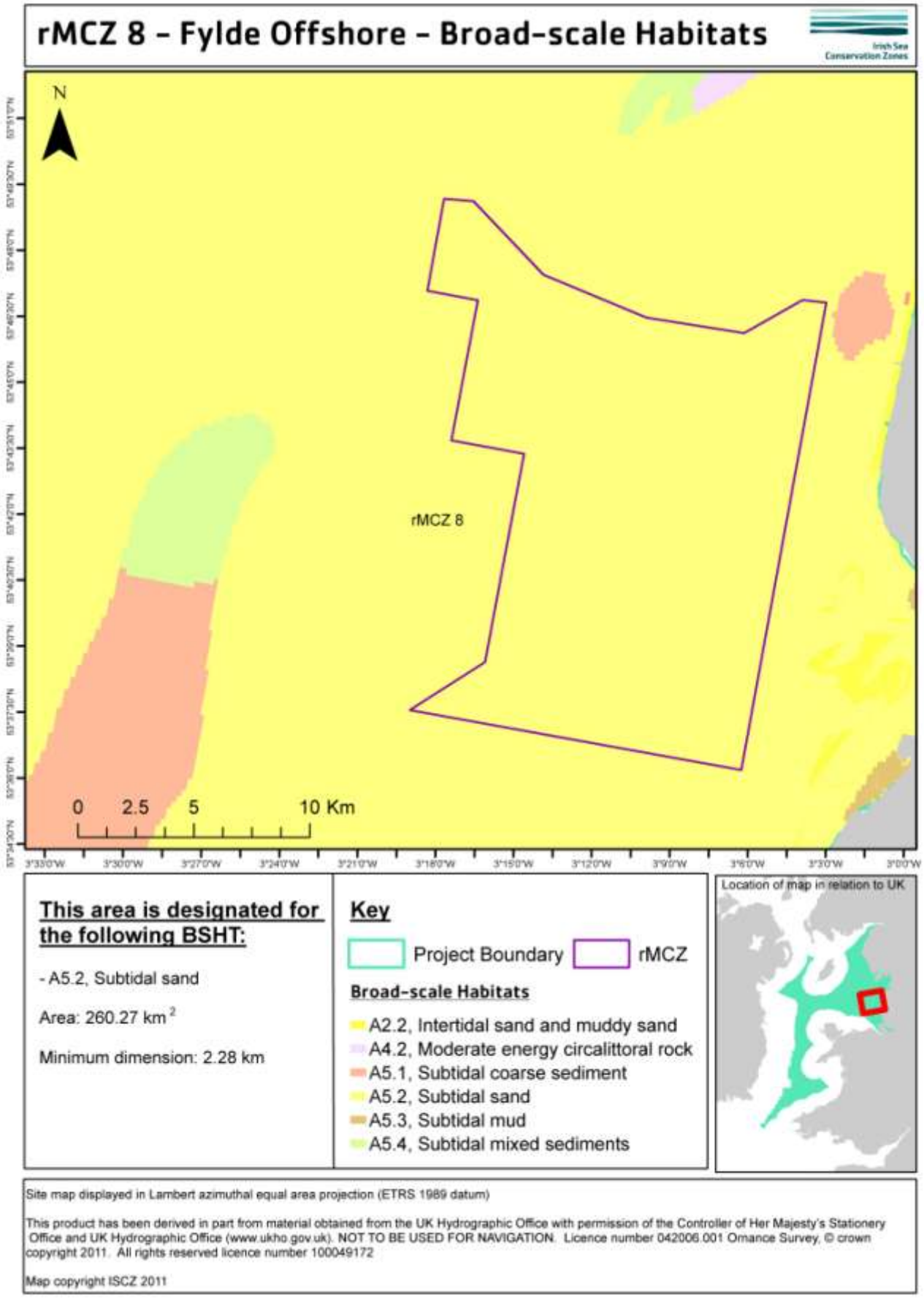
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A5.2 Subtidal sand | 260.27 $Km^2$ (26026.93 Ha) |
| Habitat of conservation importance | Subtidal sands and gravels | 199.71 $Km^2$ (19970.19 Ha) |
| Species of conservation importance | | |
| Geological feature | | |
| Other feature | Area of high biological productivity | |

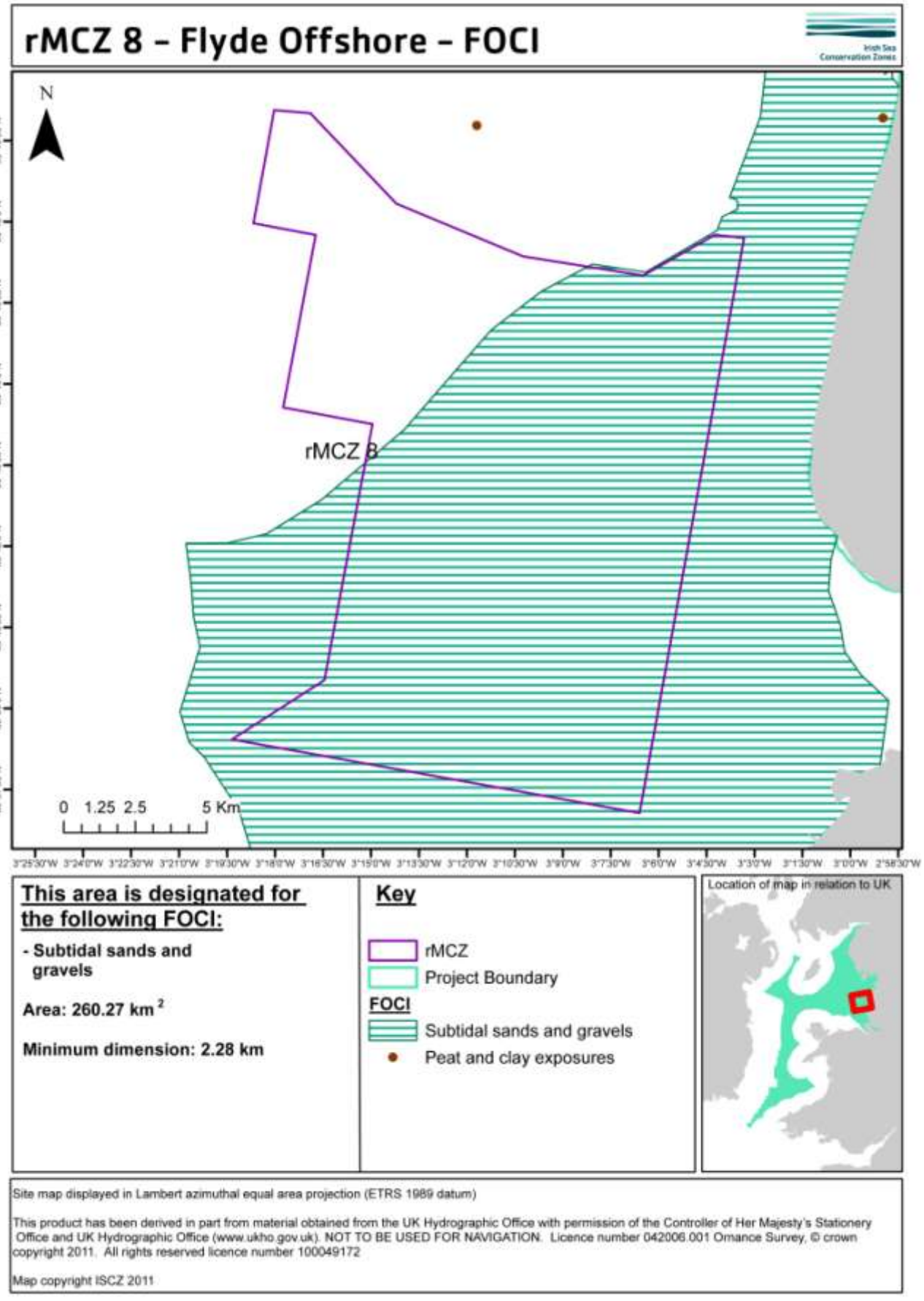
## 6. Features within rMCZ8 not proposed for designation

| **Feature type** | **Feature name** | **Reason that feature has not been proposed for designation** |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | n/a | |

## 7. Map of site


rMCZ 8- Fylde Offshore Boundary - v1.0
Irish Sea Conservation Zones
N
1
2
3
4
5
6
7
8
9
10
11
0 2.5 5 10 Km
Bounding co-ordinates:
1: 53° 50' 57.861" N, 3° 22' 20.528" W
2: 53° 49' 43.392" N, 3° 18' 0.071" W
3: 53° 49' 8.686" N, 3° 9' 52.936" W
4: 53° 50' 12.782" N, 3° 6' 49.195" W
5: 53° 39' 13.221" N, 3° 6' 45.627" W
6: 53° 39' 11.204" N, 3° 19' 56.540" W
7: 53° 40' 36.006" N, 3° 17' 23.889" W
8: 53° 45' 30.001" N, 3° 17' 23.890" W
9: 53° 45' 30.000" N, 3° 20' 17.886" W
10: 53° 48' 47.996" N, 3° 20' 17.887" W
11: 53° 48' 48.008" N, 3° 22' 19.121" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 8 – Fylde Offshore – Broad-scale Habitats
Irish Sea Conservation Zones
N
rMCZ 8
0 2.5 5 10 Km
3°33'0"W
3°30'0"W
3°27'0"W
3°24'0"W
3°21'0"W
3°18'0"W
3°15'0"W
3°12'0"W
3°9'0"W
3°6'0"W
3°3'0"W
3°0'0"W
This area is designated for the following BSHT:
- A5.2, Subtidal sand
Area: 260.27 km 2
Minimum dimension: 2.28 km
Key
Project Boundary
rMCZ
Broad-scale Habitats
A2.2, Intertidal sand and muddy sand
A4.2, Moderate energy circalittoral rock
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.3, Subtidal mud
A5.4, Subtidal mixed sediments
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 8 – Flyde Offshore – FOCI
Irish Sea Conservation Zones
N
rMCZ 8
0 1.25 2.5 5 Km
This area is designated for the following FOCI:
- Subtidal sands and gravels
Area: 260.27 km 2
Minimum dimension: 2.28 km
Key
rMCZ
Project Boundary
FOCI
Subtidal sands and gravels
Peat and clay exposures
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

rMCZ 8 is located in Liverpool Bay, approximately 3.6 km (1.8 nm) off the Fylde coast. The depth of the seabed within the site ranges from almost being exposed on a low tide (just 0.35 m depth) to 22 m at its deepest part. The site is located within the Liverpool Bay SPA, which is designated to protect red throated divers *Gavia stellata* and the common scoter *Melanitta nigra* seabird species. The management measures for the SPA are bird orientated and, as a result, this SPA will not lend any direct protection to the seabed substrate. The subtidal sand habitat in this site is of ecological importance based on the high abundance of bivalve species and the high amount of benthic productivity in the site (Kaiser et al. 2006). Animals living in and around sandbanks, such as those found within the rMCZ8 are varied, including for example, common hermit crabs *Echichthys vipera*, sea star *Asterias rubens*, flying crab *Liocarcinus holsatus* and Mysidacea (shrimp like crustaceans) (Kaiser et al. 2004). Around this general area, the distribution and abundance of bivalves is tightly coupled with the distribution of the common scoter (Kaiser et al. 2006). Areas where Common Scoter were recorded in greater numbers corresponded to the areas with the highest abundance and biomass of bivalve prey species; this underlines the importance of designating this site for what is otherwise a very common habitat type in the ISCZ project area. With Liverpool Bay SPA protecting the common scoter, the red throated diver and their prey species, and rMCZ8 protecting the associated benthic habitat, together the two designations offer a complimentary approach to protecting the marine ecosystem.

## 9. Detailed site description

rMCZ8 overlaps with Liverpool Bay SPA, which will protect red throated divers *Gavia stellata* and the common scoter *Melanitta nigra*. Natural England have confirmed that the management measures for the SPA will be bird focused and therefore this SPA will not lend any direct protection to the seabed substrate. rMCZ8 is recommended for designation of subtidal sand, which includes sandbanks, an Annex 1 habitat type on the EU Habitats Directive. The northern boundary of rMCZ8 also abuts onto Shell Flats candidate special area of conservation (cSAC), which will help further protect this broad-scale habitat. Subtidal sand is a relatively common habitat type throughout the project area, but it is the high level of benthic productivity and bivalve abundance in this area that underlies the ecological importance and motivation for proposing designation of rMCZ8.

Bivalves are not only important as a source of food to birds such as the common scoter, they also perform a number of essential roles for optimum ecosystem functioning. Bivalves play a key role in unlocking the energy of primary producers which, in the sea, are the phytoplankton (microscopic algae), and making it available to be used as food by other creatures. As such, primary producers are the very basis of the food chain that provides the fish that humans consume. It is the bivalves that make that energy readily available and useable to the next organism in the food chain. The bivalves within rMCZ8 are suspension filter feeders which live within the sediment itself, they filter suspended particles from the water column (via a siphon which extends up into the water) and discharge nutrient rich particulates onto the seabed (Dame, 1996). Such deposits promote the growth of deposit feeding and herbivorous benthic (seabed) invertebrates, which serve as prey for crabs and demersal fish (those that live on or near the seabed). This is called secondary production.

Secondary production by the benthic community is important for recycling organic matter from within the sediment and linking energy between primary production in the plankton and predatory species (Bolam et al. 2010). From a study on the distribution and feeding behavior of the Common Scoter, extensive sampling of benthic species has been done around Liverpool Bay (Kaiser et al. 2006). It is clear that the distribution

of the Common Scoter is tightly coupled with the distribution of their benthic prey, namely *Abra alba, Pharus legumen* and *Donax vittatus*. The areas where Common Scoter were recorded in greater numbers corresponded to the areas with the highest abundance and biomass of bivalve prey species (Kaiser et al. 2006).

Kaiser et al. (2004) surveyed the fish and epifaunal (animals living on the seabed surface) assemblages of sandbanks off the Welsh coastline, and noted that the general observations on the biological community in their study were likely to be applicable to sandbanks elsewhere. The epifaunal community of the surveyed sandbanks were typically varied. This included, for example, common hermit crab *Pagurus bernhardus*, common sea star *Asterias rubens*, flying crab *Liocarcinus holsatus*, lesser weaver fish *Echichthys vipera*, lesser sand eel *Ammodytes tobianus*, the greater sand eel *Hyperoplus lanceolatus*, the decapod *Philocheras trispinosus*, and Mysidacea (shrimp like crustaceans) (Kaiser et al. 2004). The fish assemblage included plaice *Pleuronectes platessa*, common dab *Limanda limanda*, grey gurnard *Eutrigla gurnardus* and brill *Scophthalamus rhombus*. The presence of rays over sandbanks, for example, the thornback ray *Raja clavata,* blonde ray and small eyed ray *Raja microocellata*) was also noted. This diverse range of fish and epifaunal animals are supported by the benthic community (animals living within the seabed). The bivalves themselves found in rMCZ8 also provide a valuable food source to demersal fish species such as plaice, flounder and common sole. They are a significant food source for juvenile fish and intermediate level predators that are also themselves prey for larger fish.

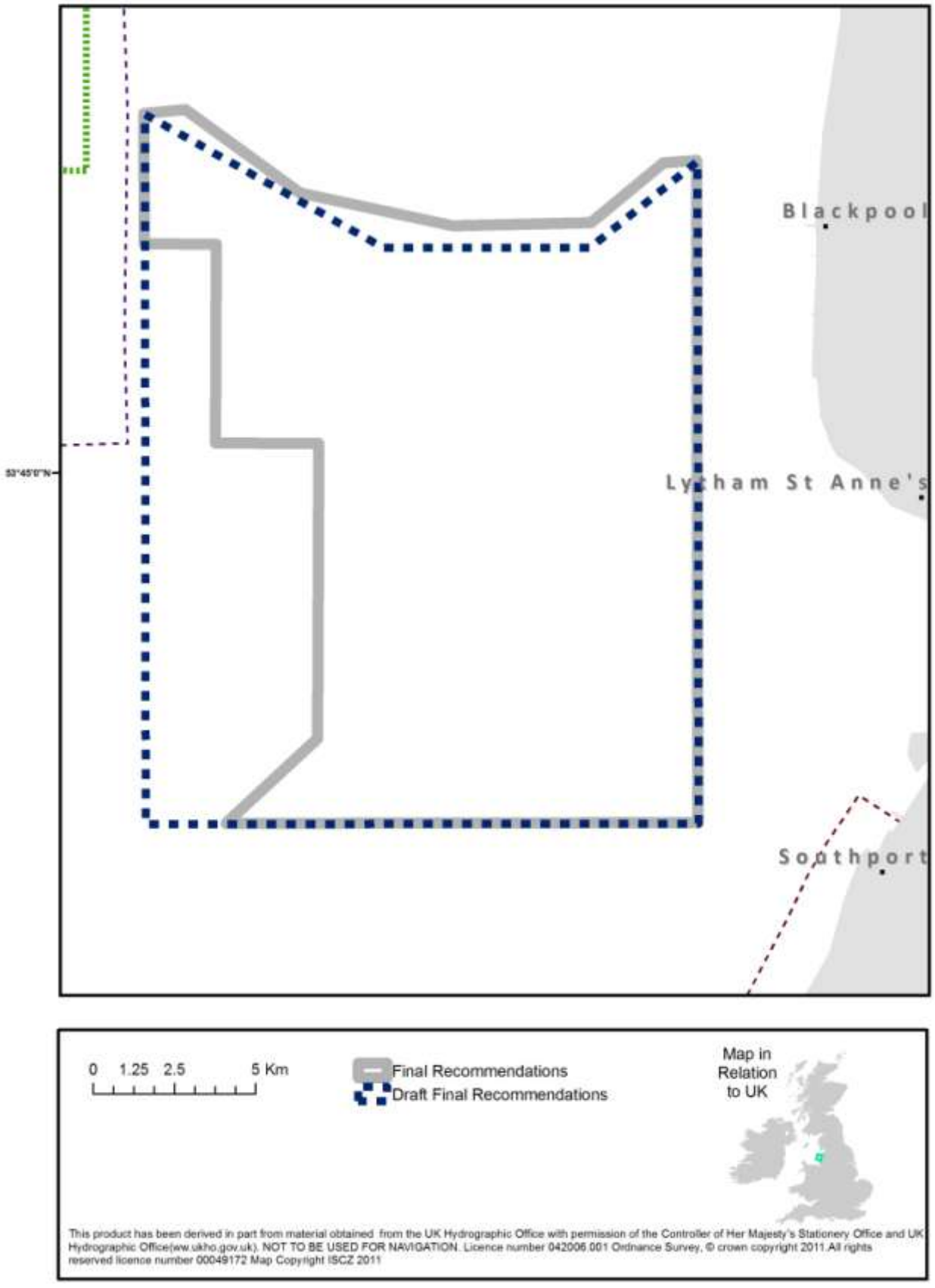
Bivalves also perform an important role in regulating and maintaining water quality. They improve water quality by filtering suspended sediments and excess, potentially harmful, nutrients (such as nitrates and phosphates). This process improves light penetration in the water column by reducing the overall turbidity which in turn benefits larger aquatic plants. The bivalves also play a modest role in stabilising the sediment that they live in, but it is dependent on their density.

rMCZ8 overlaps with Liverpool Bay Special Protection Area (SPA) which will protect red throated divers *Gavia stellata* and the common scoter *Melanitta nigra*. Natural England have confirmed that the management measures for the SPA will be bird focused and therefore this SPA will not lend any direct protection to the seabed substrate but will protect the food source of the birds. SPAs are a designation required under by the European Commission under the Birds Directive to provide increased protection and management for areas which are important for breeding, feeding, wintering or migration of rare and/or vulnerable species of birds.

## 10. Site boundary

This site was first identified at the May 9th and 10th RSG meeting when developing the draft final recommendations. The reason for the late inclusion of this site into the network was largely due to the fact that a large area of subtidal sand was removed from the now rMCZ2 during the draft final recommendation network planning. rMCZ8 was identified to protect the productive subtidal sand in the north part of Liverpool Bay, with associated high benthic bivalve abundance. It was felt that this boundary would have significant ecological benefit for the network whilst also minimising the impact on local fishermen operating from Fleetwood and Lytham. The site boundaries were modified slightly for the final recommendations so that it overlapped exactly with the Liverpool Bay SPA to the west and the Shell Flats SAC to the north. The development of the site boundary through time is shown on the below map.

# rMCZ 8- Iteration 1- Final Recommendations



## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Subtidal Sand**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Sand** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, no human activities will require additional management in the site. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, other recreation and other fisheries. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the **Subtidal Sands and Gravels**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>Representative of **Subtidal Sands and Gravels** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sands and Gravels** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics*)<br>• *Physical loss (to land or freshwater habitat)*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Salinity changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on a current assessment of activities taking place in the site, no human activities will require additional management in the site. Those activities that are known to take place in the site that will be managed through the current regulatory framework are telecom and power cables. Those activities that are deemed not to require management but are known to take place in the site are shipping, transit of vessels, recreational angling, other recreation and other fisheries. |

## 12. Sites to which this site is related

rMCZ 8 is 15 km (8.09 nm) from rMCZ2 and 55 km (29.67 nm) from rMCZ1, which both propose EUNIS Level 2 sublittoral sediment features for designation.

There are a number of existing and draft conservation areas in the vicinity of the rMCZ8 that are being designated for marine components. In this context, vicinity is being defined as any distance less than 80 km. Within 40 km of rMCZ8 are the following sites: Morecambe Bay, Sefton Coast, Dee estuary, Duddon estuary, Ribble and Alt estuaries, Mersey Estuary, Liverpool Bay, Shell Flats and Lune Deep. A further three sites, Drigg Coast, Menai Straits and Conwry Bay fall within 80 km of rMCZ8.

As mentioned in the site description, rMCZ8 overlaps part of the Liverpool Bay SPA, which has been designated to protect red throated divers *Gavia stellata* and the common scoter *Melanitta nigra*. The northern boundary of rMCZ8 also abuts onto Shell Flats SAC.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of subtidal sand | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007) |
| Location of subtidal sands and gravels | Combined physical and biological surveying with habitat modelling | Robinson et al. (2007) |
| Location of areas of high biological productivity | Aerial surveys, grab samples and behavioural observations | Kaiser et al. (2006) |

## 14. Stakeholder considerations

***Caveats:***

17. The site was agreed by NW IFCA if there are no additional management measures proposed.
18. Concerns were raised about future fishing in this zone and the need for management to be flexible if future levels of fishing increase.
19. Concerns were raised about anchoring (commercial shipping), although this is not a major concern in this area.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most stakeholders accepted the inclusion of rMCZ8 in the final network in order to satisfy the ENG targets. The site received a good level of support from the commercial fishing and conservation sectors, relative to the subtidal sand zone that it replaced in the network (to the south of rMCZ2).

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References


BOLAM, S.G., BARRIO-FROJAN, C.R.S. & EGGLETON, J.D. 2010. *Macrofaunal production along the UK continental shelf*. Journal of Sea Research **64**: 166-179.

DAME, RF. 1996. Ecology of Marine Bivalves: An Ecosystem Approach. Boca Raton (FL):CRC Press.

KAISER, M.J., BERGMANN, M., HINZ, H., GALANIDI, M., SHUCKSMITH R., REES, E.I.S, DARBYSHIRE, T. & RAMSAY, K. 2004. *Demersal fish and epifauna associated with sandban habitats.* Estuarine, Coastal and Shelf Science **60:** 445-456.

KAISER, M.J., GALANIDI, M., SHOWLER, D.A., ELLIOT, A.J., CALDOW, R.W.G., REES, E.I.S., STILLMAN, R.A. & SUTHERLAND,W.J. 2006. *Distribution and behaviour of Common Scoter Melanitta nigra relative to prey resources and environmental parameters.* Ibis **148**: 110-128.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 10 ALLONBY BAY

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 10 - Allonby Bay (zone includes recommended reference area H).

## 2. Site centre location

rMCZ 10:
54° 45' 59.721" N, 3° 28' 59.778" W
54.766589 Lat, -3.483272 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA H:
54° 47' 22.760" N, 3° 28' 39.575" W
54.789655 Lat, -3.477659Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

39.06 $Km^2$ (3905.7 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

## 5. Features proposed for designation within rMCZ 10

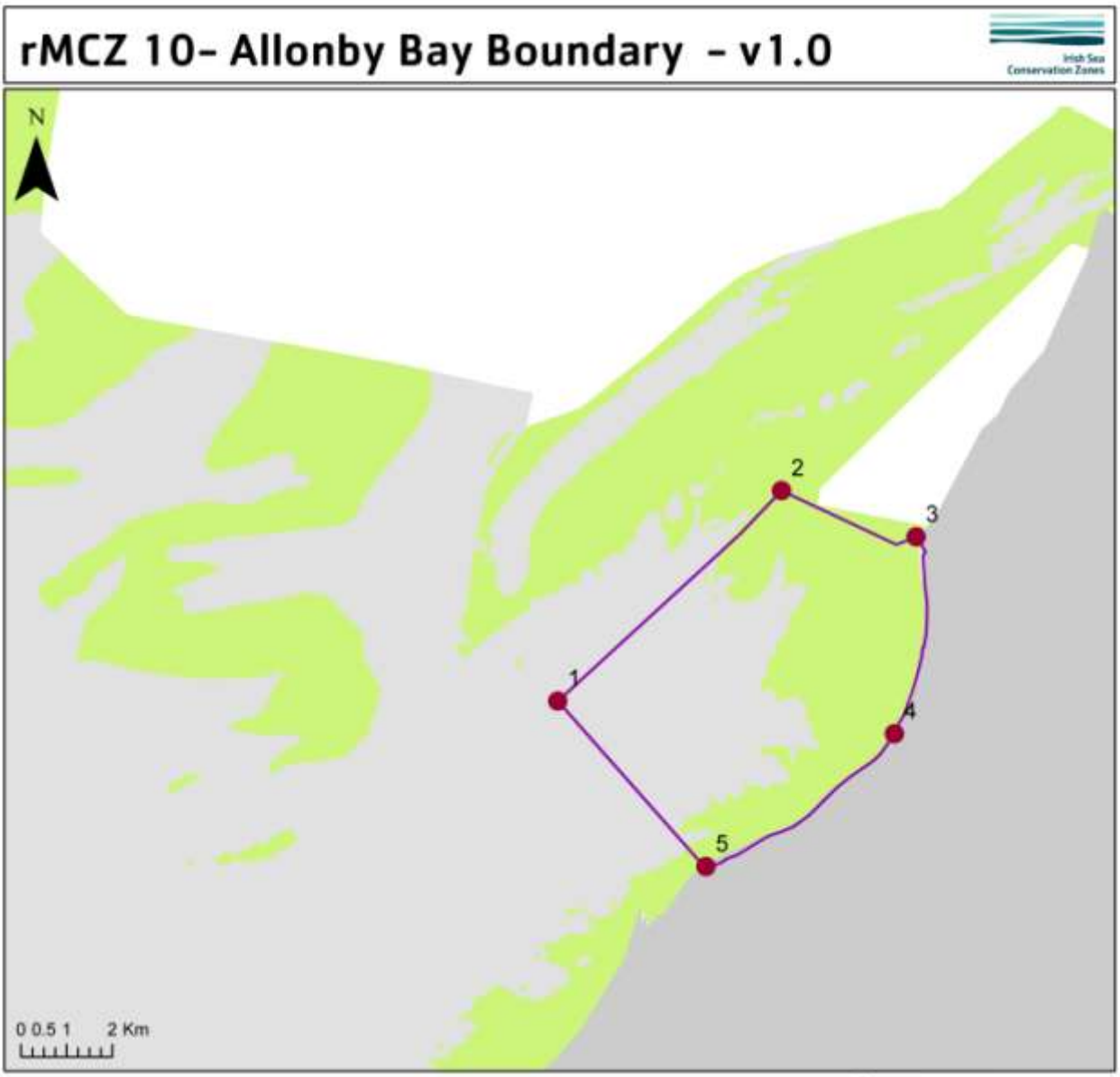
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A1.1 High energy intertidal rock | 0.005 $Km^2$ (0.45 Ha) |
| | A2.7 Intertidal biogenic reefs | 4.47 $Km^2$ (446.89 Ha) |
| | A5.1 Subtidal coarse sediment | 22.05 $Km^2$ (2204.48 Ha) |
| | A5.2 Subtidal sand | 11.26 $Km^2$ (1126.03 Ha) |
| Habitat of conservation importance | Blue mussel (*Mytilus edulis)* beds | - |
| | Peat and clay exposures | |
| | Honeycomb worm (*Sabellaria alveolata)* reefs | 1.01 $Km^2$ (101.46 Ha) |
| | Subtidal sands and gravels | 35.04 $Km^2$ (3503.6 Ha) |

| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | n/a | |

## 6. Features within rMCZ10 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal sand and muddy sand | Based on the project team's rule of thumb for designating features |
| | High energy infralittoral rock | Based on the project team's rule of thumb for designating features |
| | Moderate energy infralittoral rock | Based on the project team's rule of thumb for designating features |
| | Intertidal mixed sediments | Based on the project team's rule of thumb for designating features |
| Habitat of conservation importance | | |
| Species of conservation importance | | |

## 7. Map of site




Bounding co-ordinates:

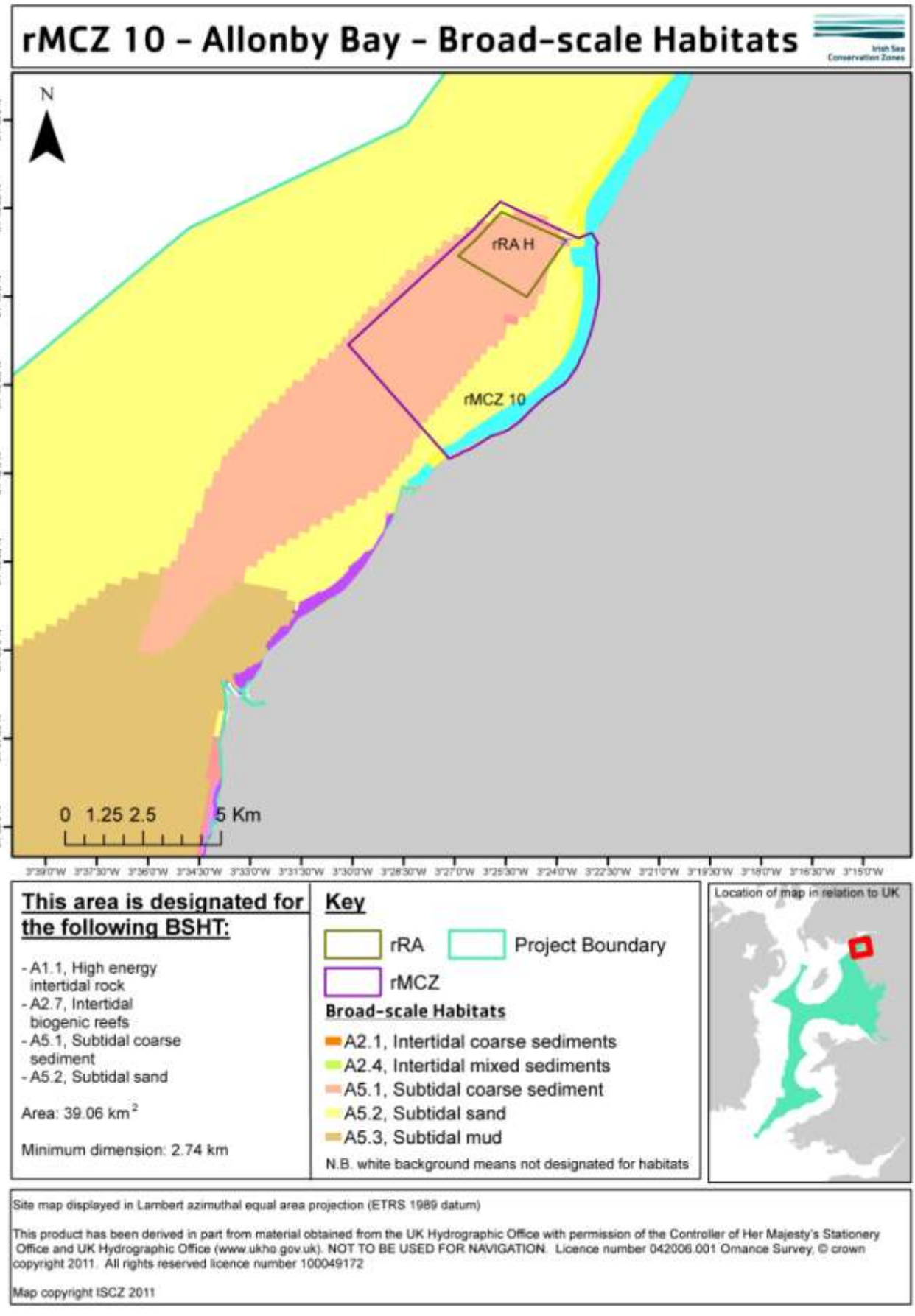
1: 54° 45' 16.937" N, 3° 33' 0.635" W
2: 54° 48' 11.783" N, 3° 29' 20.566" W
3: 54° 47' 57.598" N, 3° 26' 28.140" W
4: 54° 45' 38.489" N, 3° 26' 8.810" W
5: 54° 43' 42.063" N, 3° 29' 24.414" W

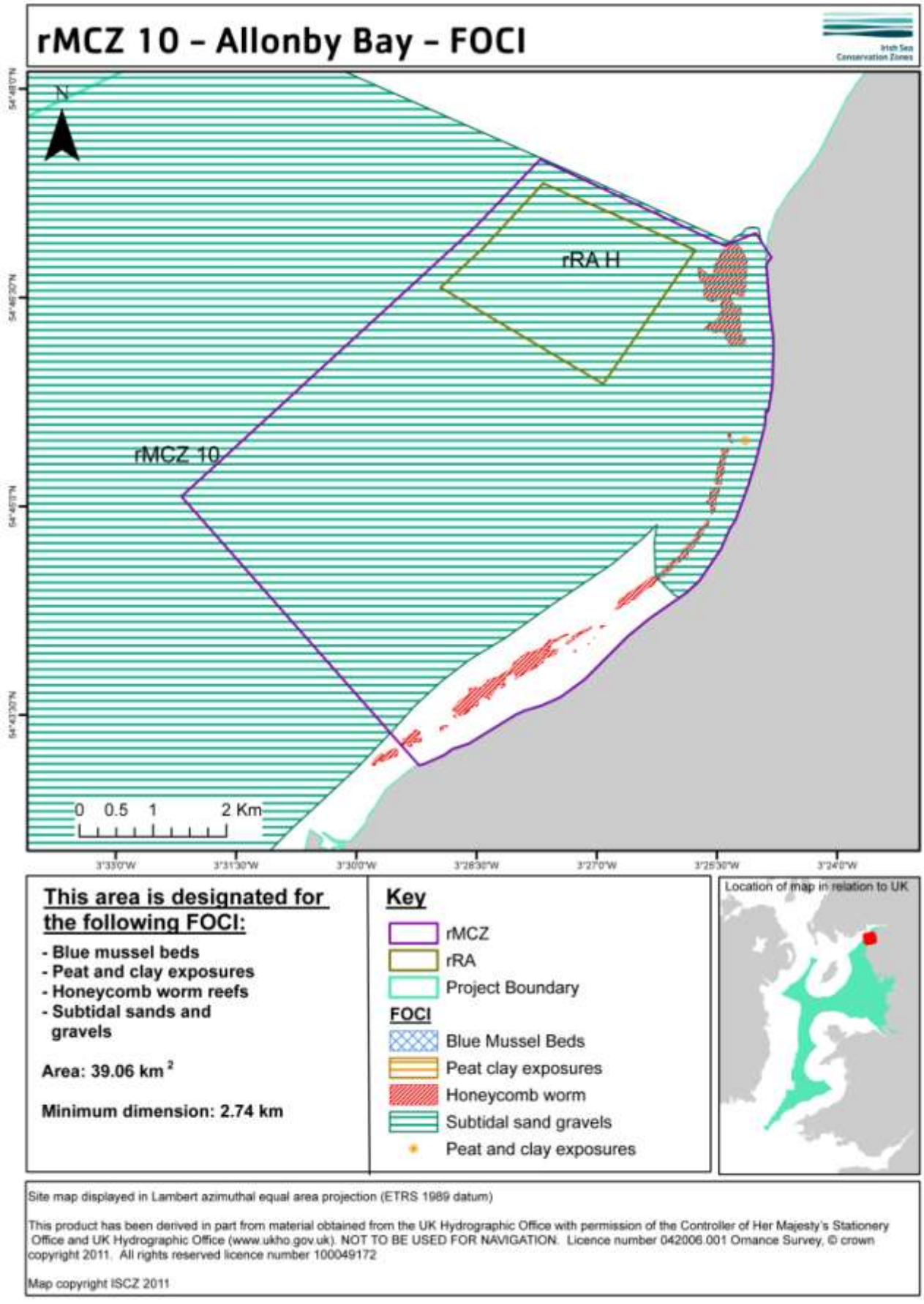
**Legend**

Depth (m)

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)


rMCZ 10 – Allonby Bay – Broad-scale Habitats
Irish Sea Conservation Zones
N
rRA H
rMCZ 10
0 1.25 2.5 5 Km
3°39'0"W 3°37'30"W 3°36'0"W 3°34'30"W 3°33'0"W 3°31'30"W 3°30'0"W 3°28'30"W 3°27'0"W 3°25'30"W 3°24'0"W 3°22'30"W 3°21'0"W 3°19'30"W 3°18'0"W 3°16'30"W 3°15'0"W
This area is designated for the following BSHT:
- A1.1, High energy intertidal rock
- A2.7, Intertidal biogenic reefs
- A5.1, Subtidal coarse sediment
- A5.2, Subtidal sand
Area: 39.06 km²
Minimum dimension: 2.74 km
Key
rRA
Project Boundary
rMCZ
Broad-scale Habitats
A2.1, Intertidal coarse sediments
A2.4, Intertidal mixed sediments
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.3, Subtidal mud
N.B. white background means not designated for habitats
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 10 – Allonby Bay – FOCI
Irish Sea Conservation Zones
N
rRA H
rMCZ 10
0 0.5 1 2 Km
54°48'0"N
54°46'30"N
54°45'0"N
54°43'30"N
3°33'0"W
3°31'30"W
3°30'0"W
3°28'30"W
3°27'0"W
3°25'30"W
3°24'0"W
This area is designated for the following FOCI:
- Blue mussel beds
- Peat and clay exposures
- Honeycomb worm reefs
- Subtidal sands and gravels
Area: 39.06 km 2
Minimum dimension: 2.74 km
Key
rMCZ
rRA
Project Boundary
FOCI
Blue Mussel Beds
Peat clay exposures
Honeycomb worm
Subtidal sand gravels
Peat and clay exposures
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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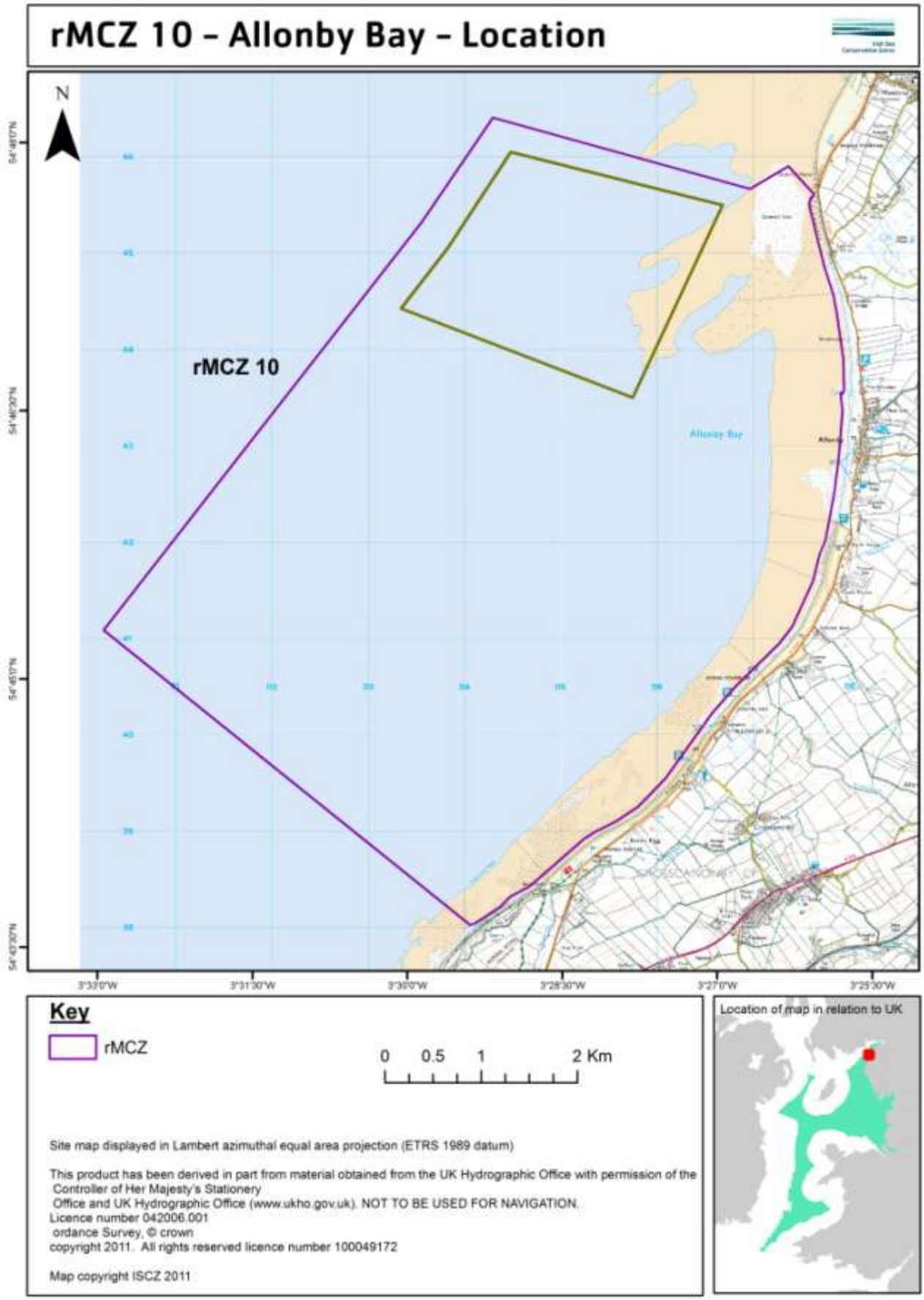
rMCZ 10 – Allonby Bay – Location
N
rMCZ 10
Allonby Bay
54°48'0"N
54°46'30"N
54°45'0"N
54°43'30"N
3°33'0"W
3°31'30"W
3°30'0"W
3°28'30"W
3°27'0"W
3°25'30"W
Key
rMCZ
0 0.5 1 2 Km
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION.
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## 8. Site summary

rMCZ 10 is situated on the north Cumbrian coast within Allonby Bay in the northeast of the ISCZ project area. The site extends from the intertidal zone out to approximately 5.5 km (3 nm) off the coast to a depth of 6 m and includes a mixture of habitat types. The intertidal area of this site has been surveyed since 1993 by the Cumbria Sea Fisheries Committee (Lancaster 2010). Maryport Roads, an area of subtidal coarse sediment, was surveyed extensively between the late 1960s and 1980s (e.g. Perkins 1973; 1988) and has been noted as an area of high biodiversity. The intertidal biogenic reefs, formed of blue mussels and honeycomb worm reefs, are extensive features that are typical of this part of the Cumbrian shore (Lancaster J. pers. comm. 2010).

## 9. Detailed site description

The Cumbrian coast is relatively unusual in so far as there is detailed information on the ecology of the intertidal areas of rocky shore. These areas have been surveyed annually since 1993 through work commissioned by the Cumbria Sea Fisheries Committee (Lancaster 2010). The Solway Firth estuary represents the northerly limit of honeycomb worm *Sabellaria alveolata* reefs, and the Cumbrian coast is noted for having the UKs most extensive and best representative examples of this habitat type. Dubmill Scar, which contains excellent examples of both honeycomb worm reefs and blue mussel beds, is within rMCZ 10. In addition, the honeycomb worm reefs found in this area are solid, persistent structures, unlike the ephemeral reefs which are located further south of the site (Lancaster J. pers. comm. 5th April 2010).

At Dubmill scar, honeycomb worm reefs range from 10-60 cm in height. Individually, these tube dwelling worms cement together sand grains to form the structure in which they live. Collectively these structures support a range of other species. For example, within rMCZ 10, the following species have been recorded in and around honeycomb worm reefs; breadcrumb sponges *Halichondria panacea*, baked bean ascidians *Dendrodoa grossularia*, kelp, oarweed, sea lettuce *Ulva intestinalis*, sea mats *Membranipora membranacea* and different crab species (Lancaster 2010).

In 2010, at extreme low tide at Dubmill scar, beds of blue mussels mainly contain dead mussels, but large (45 mm) live mussels were present. Also present around the beds were sea lettuce *Ulva intestinalis* and *Ceramium* red algae (Lancaster 2010).

Maryport Roads was initially identified in Perkins (1973) as an extremely diverse, shallow and cobbley area with associated subtidal mixed sediments. It was thought by the RSG that this area would benefit from MCZ protection. Within this area the substrate is generally thought to be incompatible with benthic fishing and was, therefore, deemed an excellent site for a reference area as it would have relatively little socio-economic impact. Maryport Roads is an important offshore boulder and cobble scar ground. The environment is extremely productive and diverse with sponges, soft corals such as dead man's fingers *Alyconium digitatum*, bryozoans including hornwrack *Flustra folacea*, the red sea squirt *Dendrodoa grossularia*, anemones, hydroids and the reef building honeycomb worm *Sabellaria alveolata* (EN 1997).

Subtidal sand sediments at Maryport Roads are characterised by the bivalves *Mactra stultorum* and banded wedge shell *Donax vittatus*, medium sands by the bivalve surf clam *Spisula solida*, and muddy sands by the polychaete *Nephtys* spp. and the bivalves *Nucula sulcata*, *Abra albida* and *Angulus tenuis* (Perkins 1973, cited in Mills 1998).

The communities recorded from sublittoral scar grounds exhibit rich and well developed epifaunal communities (living on the benthic substrate) similar to rocky underboulder communities characterised by the sponge breadcrumb sponge *Halichondria panicea*, the hydroid *Abietinaria abietina*, the polychaete ross worm *Sabellaria alveolata*, the common whelk *Buccinum undatum*, the horse mussel *Modiolus modiolus*,

the bryozoan hornwrack *Flustra foliacea* and the sea squirt *Dendrodoa grossularia.* Sublittoral scar grounds were also considered to be important for the presence of commercially important species such as the edible crab *Cancer pagurus* and lobster *Homarus gammarus*, and for the fish that use them as feeding grounds (Mills 1998).

This area has also been identified by the RSG as an important spawning ground for commercial species including skate - thornback ray *Raja clavata* and bass. The shallow waters and rugosity (complexity of the habitat) provide a natural refuge area from predators. It is also thought to be an important pupping ground for harbour porpoise *Phocoena phocoena*.

There is much anecdotal evidence (local ecological knowledge) to inform and support the high biodiversity of this area, but there is a distinct paucity of recent, scientific peer reviewed literature. Designating rMCZ 10 helps to link inshore and offshore sand and coarse sediment habitats. It also has the potential to inform, if closely monitored, local fisheries science in terms of a greater understanding of spawning and nursery grounds of commercially important species, as well as having wider research potential.

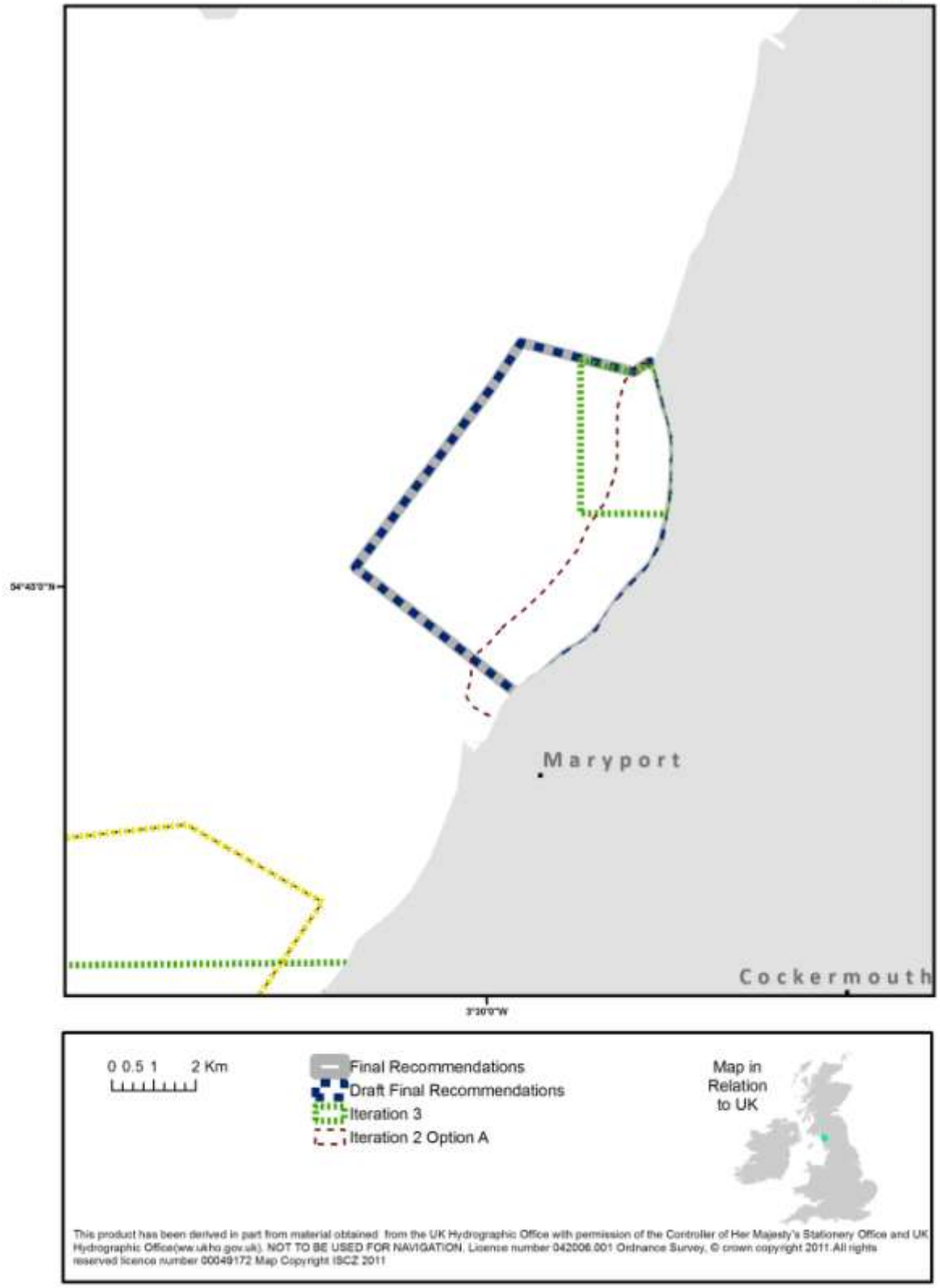
Site identification work was supported by knowledge and data for several important seabird species. rMCZ 10 is an important area for seabirds in the Irish Sea providing a foraging ground to a wide range of species. These include: guillemots (*Uria aalge*), gannets (*Morus bassanus*), Manx shearwaters (*Puffinus puffinus*) razorbill (*Alca torda*) and puffins (*Fratercula arctica*). Several of these birds are coastal species; they do not forage great distances, and will originate from English and Scottish colonies (Gouldstone pers comm. 2011).

RSPB data incorporated in the Areas of Aditional Ecological Importance GIS layer shows that the whole of the site, which contains a heavily biodiverse gravel-boulder habitat, is heavily used by a number of species. Locally, guillemots (*Uria aalge*) feed on sandeel, herring and sprat; puffins (*Fratercula arctica*) feed on sandeel and capelin; razorbill (*Alca torda*) feed on sandeel, herring and sprat. Little tern (*Sterna albifrons*) feed on sandeel and herring (Gouldstone pers comm. 2011).

## 10. Site boundary

This site is located in Allonby Bay. It was first identified at the third iteration as a small site that abutted onto the Solway Firth SAC. It increased in size significantly for the draft final recommendations to include the full area of Allonby Bay and it remained unchanged for the final recommendations. It now includes full extent of the bay and part of an offshore area of seabed locally known as Maryport Roads.

# rMCZ 10- Iteration 1- Final Recommendations



## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintain** the **High Energy Intertidal Rock** to favourable condition, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **High Energy Intertidal Rock** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **High Energy Intertidal Rock** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Water clarity changes* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintain** the **Intertidal Biogenic Reefs**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Intertidal Biogenic Reefs**, in the biogeographic region are all **maintained** , such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Intertidal Biogenic Reefs**, is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Physical change (to another seabed type)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Water flow (tidal & ocean current) changes - regional/national*<br>• *Water flow (tidal current) changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintin** the **Subtidal Sand** such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Subtidal Sand** in the biogeographic region are all **maintined** , such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sand** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintain** the **Subtidal Coarse Sediment**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Subtidal Coarse Sediment** in the biogeographic region are all **maintained** , such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Coarse Sediment** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Physical change (to another seabed type)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Surface abrasion: damage to seabed surface features* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintain** the **Subtidal Sands and Gravels** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Subtidal Sands and Gravels** in the biogeographic region are all **maintained**. |
| **Advice on operations** | |
| 3<br>Pressures | **Subtidal Sands and Gravels** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• Surface abrasion: damage to seabed surface features<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Salinity changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **maintain** the ***Sabellaria alveolata* (Honeycomb Worm) Reef** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the ***Sabellaria alveolata* (Honeycomb Worm) Reef** in the biogeographic region are all **maintained**. |
| **Advice on operations** | |
| 3<br>Pressures | ***Sabellaria alveolata* (Honeycomb Worm) Reef** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Surface abrasion: damage to seabed surface features*<br>• *Removal of non-target species (lethal)*<br>• *Physical change (to another seabed type*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - local*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Temperature changes - regional/national*<br>• *Water flow (tidal current) changes - local*<br>• *Siltation rate changes (high)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **maintain** the **Peat and Clay Exposures**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Peat and Clay Exposures** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Peat and Clay Exposures** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Atmospheric climate change*<br>• *Temperature changes - regional/national*<br>• *Emergence regime changes - local*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change **maintain** the ***Mytilus edulis* (Blue Mussel) Beds**, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Mytilus edulis* (Blue Mussel) Beds** in the biogeographic region are all **maintained** ,such that the feature makes its contribution to the network |
| **Advice on operations** | |
| 3 Pressures | ***Mytilus edulis* (Blue Mussel) Beds** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Surface abrasion: damage to seabed surface features*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water clarity changes* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities taking place in the site, no additional management of these activities is required. |

## 12. Sites to which this site is related

rMCZ10 is located in between two other recommended MCZs. The Solway Firth rMCZ is 23 km (12 nm) to the north, a site that is being recommended for designation for two highly mobile species, smelt *Osmerus eperlanus* and European eel *Anguilla Anguilla.* The Solway rMCZ also contains the same EUNIS level 2 habitat types, sublittoral sediment, littoral rock and littoral sediment, although this is not proposed for designation. Located 38 km (20 nm) to the south of rMCZ 10 is rMCZ 11, which shares the same EUNIS level 2 habitats, sublittoral sediment, littoral rock, littoral sediment and infra-littoral rock.

rMCZ 10 is in the vicinity (defined here as within 80 km (43 nm) of the following existing or proposed sites that have marine features designated for protection: Morecambe Bay (SPA, SSSI) and Duddon estuary (SPA / SSSI). A further three sites are within 40 km of the rMCZ10, Solway Firth (SAC), Drigg coast (SAC), Upper Solway flats and marshes (SPA).

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Blue mussel (Mytilus edulis) beds | Data and ecological survey | DEFRA commissioned MB102 contract |
| Peat and clay exposures | Data and ecological survey | DEFRA commissioned MB102 contract based on CCW survey in 2002 |
| Piddocks (Barnea candida and Barnia parva) | Data and ecological survey | DEFRA commissioned MB102 contract |
| High energy intertidal rock<br>Intertidal biogenic reefs<br>Subtidal coarse sediment<br>Subtidal sand | Combined physical and biological surveying with habitat modelling | MESH Project |

## References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# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 11 CUMBRIA COAST

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 11 - Cumbria Coast (this zone includes two recommended reference areas, rRA I and rRA J. It is also a multipart MCZ and contains an area that has been designated to protect Black Guillemots – a non-ENG feature - and not the underlying broad-scale habitat or FOCI).

## 2. Site centre location

rMCZ 11:
54° 27' 27.471" N, 3° 34' 12.062" W
54.45763 Lat, -3.570017 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA I:
54° 29' 37.440" N, 3° 37' 18.975" W
54.493733 Lat, -3.621937 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA J:
54° 31' 35.541" N, 3° 37' 12.005" W
54.526539 Lat, -3.620001 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

17.17 $Km^2$ (1715.85 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

## 5. Features proposed for designation within rMCZ 11

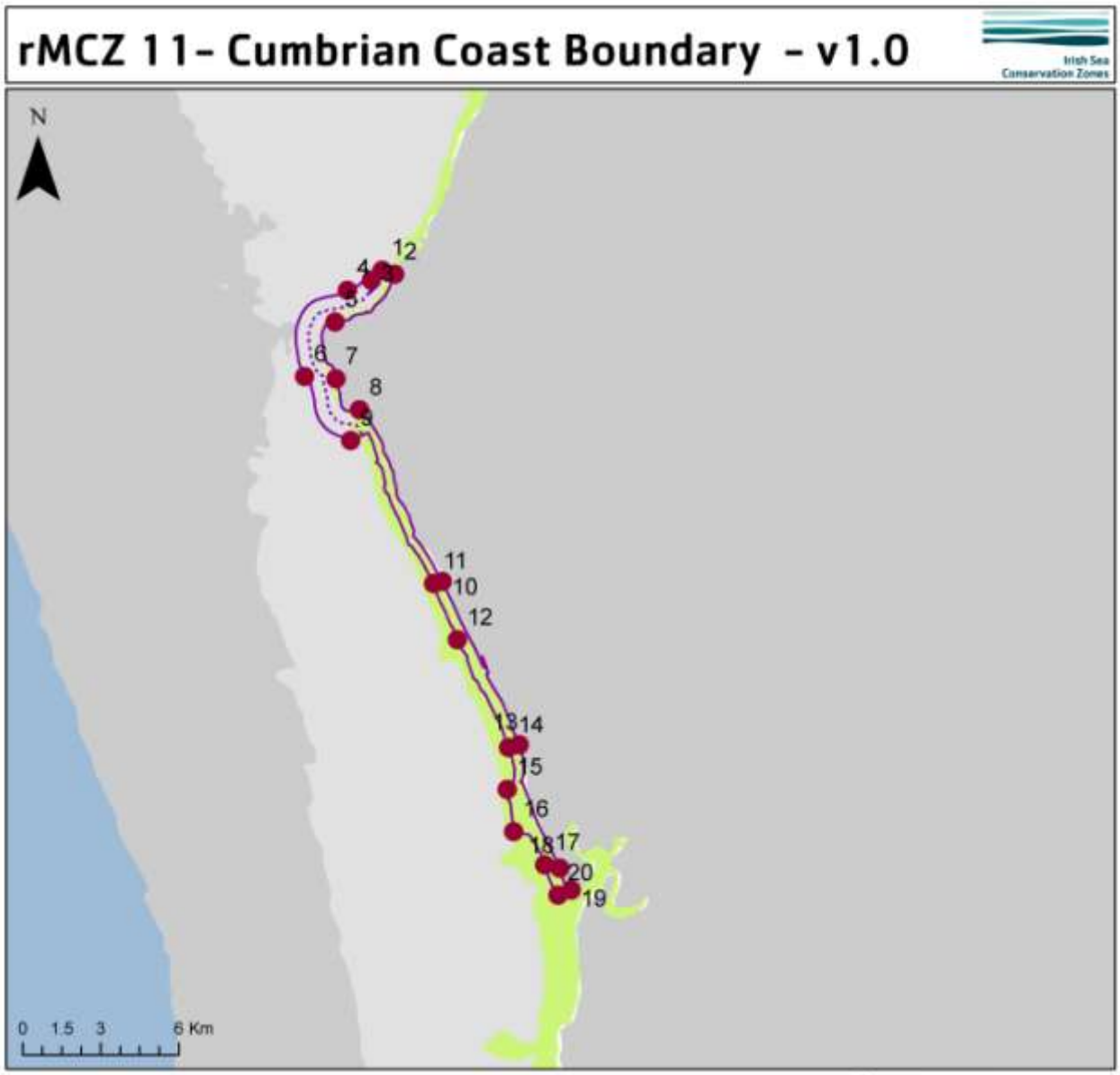
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A1.1 High energy intertidal rock | 0.04 $Km^2$ (4.45 Ha) |
| | A2.2 Intertidal sand and muddy sand | 5.01 $Km^2$ (501.33 Ha) |
| | A2.7 Intertidal biogenic reefs | 1 $km^2$ (100.44 Ha) |
| | A3.1 High energy infralittoral rock | 0.46 $Km^2$ (46.23 Ha) |

| Feature type | Feature name | Area covered within site (for broad scale habitats and habitats of conservation importance) |
|---|---|---|
| Habitat of conservation importance | Blue mussel *(Mytilus edulis*)beds<br>Intertidal underboulder communities<br>Peat and clay exposures<br>Honeycomb worm (*Sabellaria alveolata)* reefs | -<br>-<br>-<br>0.61 $Km^2$ (61.48 Ha) |
| Species of conservation importance | | |
| Geological feature | | |
| Other feature | Narrow leaved eelgrass (*Zostera angustifolia)*<br>Black guillemot (*Cepphus grille)* | |

## 6. Features within rMCZ 11 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal coarse sediments<br>Intertidal mud<br>Intertidal mixed sediments<br><br>Subtidal sand<br>Subtidal mud | The intertidal features in rMCZ11 did not meet the project team's rule of thumb for designating features<br><br>At the agreement of the regional stakeholder group, the only non-intertidal features being designated in rMCZ11 are black guillemots. |
| Habitat of conservation importance | Subtidal sands and gravels | At the agreement of the regional stakeholder group, the only non-intertidal features being designated in rMCZ11 are black guillemots. |
| Species of conservation importance | | |

## 7. Map of site




Bounding co-ordinates:

1: 54° 32' 23.346" N, 3° 36' 42.145" W
2: 54° 32' 21.452" N, 3° 36' 14.131" W
3: 54° 32' 8.706" N, 3° 37' 0.524" W
4: 54° 31' 50.847" N, 3° 37' 47.169" W
5: 54° 31' 9.450" N, 3° 37' 59.820" W
6: 54° 29' 55.917" N, 3° 38' 41.627" W
7: 54° 30' 0.309" N, 3° 37' 34.786" W
8: 54° 29' 28.215" N, 3° 36' 32.546" W
9: 54° 28' 48.507" N, 3° 36' 38.773" W
10: 54° 26' 18.279" N, 3° 32' 28.987" W
11: 54° 26' 13.744" N, 3° 32' 46.404" W
12: 54° 25' 10.677" N, 3° 31' 33.685" W
13: 54° 23' 17.219" N, 3° 28' 41.502" W
14: 54° 23' 11.353" N, 3° 29' 2.788" W
15: 54° 22' 19.940" N, 3° 28' 48.733" W
16: 54° 21' 29.953" N, 3° 28' 18.335" W
17: 54° 20' 56.513" N, 3° 26' 59.767" W
18: 54° 20' 55.996" N, 3° 26' 27.036" W
19: 54° 20' 32.071" N, 3° 25' 54.337" W
20: 54° 20' 22.599" N, 3° 26' 19.897" W

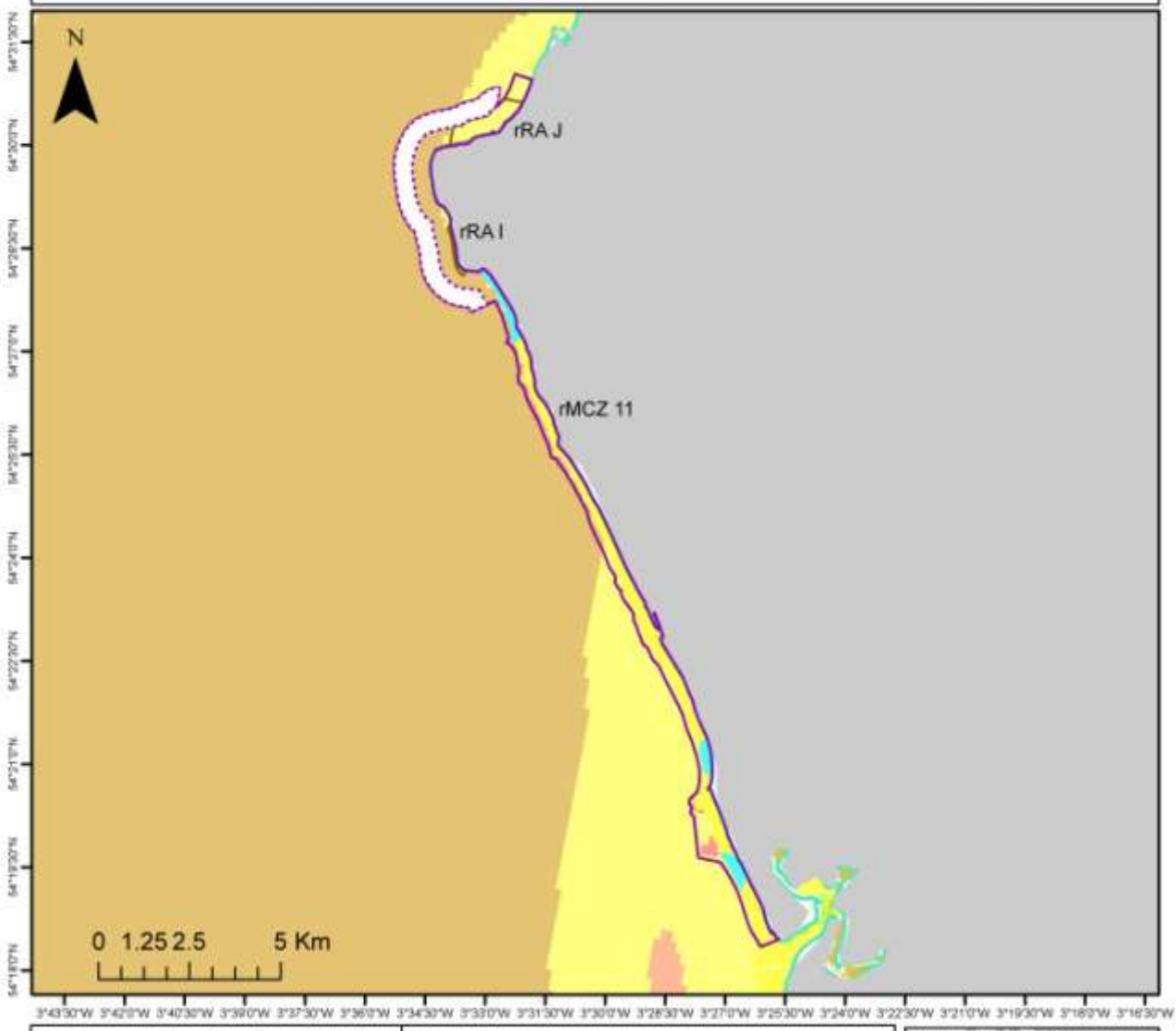
**Legend**

**Depth (m)**

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

# rMCZ 11 – Cumbrian Coast – Broad-scale Habitats




**This area is designated for the following BSHT:**

- A1.1, High energy intertidal rock
- A2.2, Intertidal sand and muddy sand
- A2.7, Intertidal biogenic reefs
- A3.1, High energy infralittoral rock

Area: 17.17 km$^2$

Minimum dimension: 0.54 km

**Key**

Multipart MCZ | Project Boundary

rMCZ | rRA

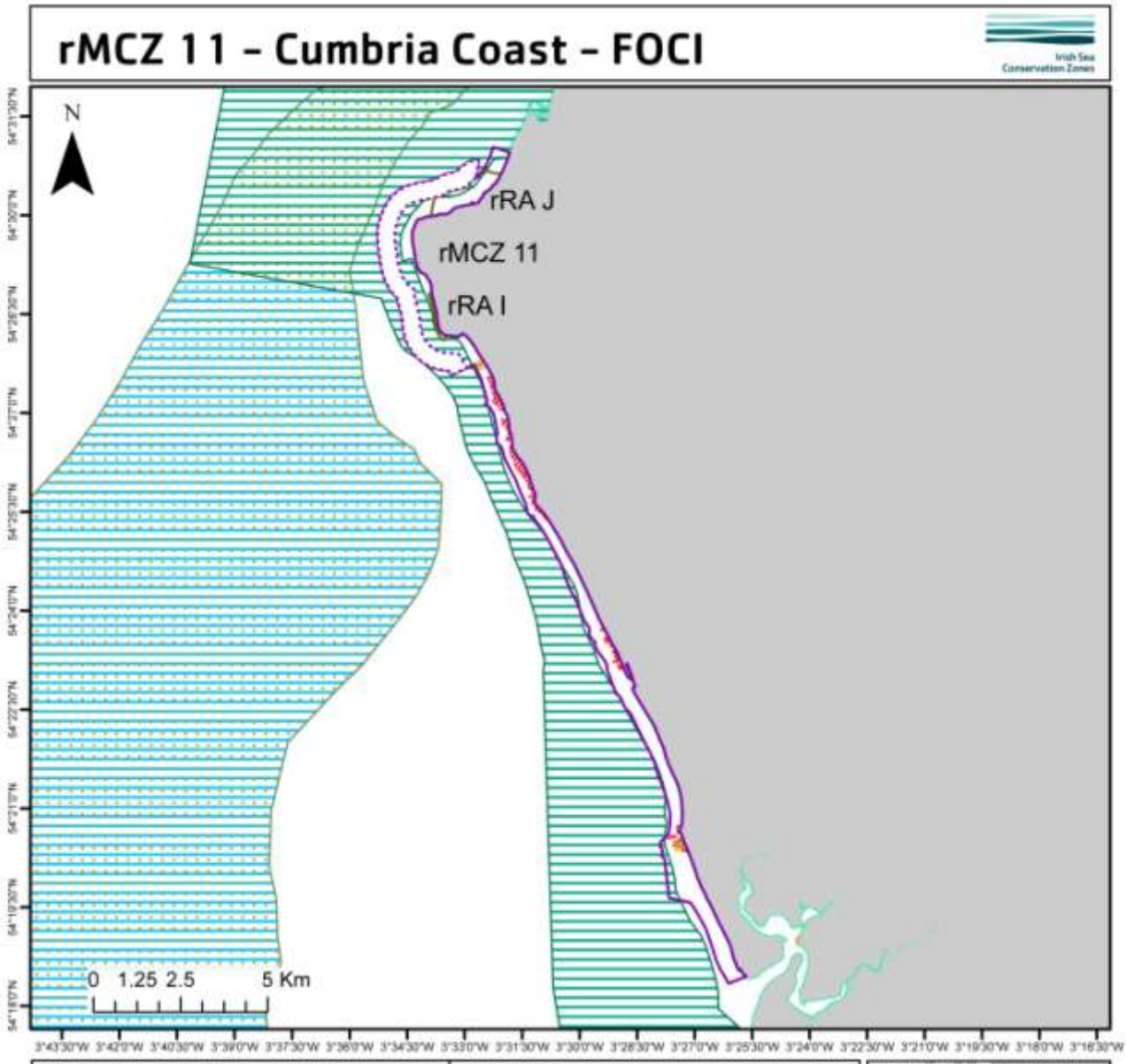
**Broad-scale Habitats**

- A2.1, Intertidal coarse sediments
- A2.3, Intertidal mud
- A2.4, Intertidal mixed sediments
- A5.1, Subtidal coarse sediment
- A5.2, Subtidal sand
- A5.3, Subtidal mud

N.B. white background means not designated for habitats

Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)




**This area is designated for the following FOCI:**

- **Blue mussel beds**
- **Intertidal underboulder communities**
- **Peat and clay exposures**
- **Honeycomb worm reefs**
- **Subtidal sands and gravels**
- **Black guillimots**

**Area: 17.17 km²**

**Minimum dimension: 0.54 km**

**Key**

- rMCZ
- Multipart MCZ
- rRA
- Project Boundary

**FOCI**

- Blue mussel beds
- Mud habitats in deep water
- Honeycomb worm reefs
- Sea pens and burrowing megafauna communities
- Subtidal sand gravels
- Peat and clay exposures

Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

# 8. Site summary rMCZ 11

rMCZ 11 is located on the Cumbrian coast in the eastern Irish Sea. The northern tip of the site includes St Bees Head and it extends down the length of the coast, past Sellafield to the Esk River in the Ravenglass estuary. This is primarily an intertidal site, recommended to protect features such as biogenic reefs, blue mussel *Mytilus edulis* beds and honeycomb worm *Sabellaria alveolata* reefs (Lancaster 2010). There are also peat and clay exposures (Seeley et al. 2010), and intertidal underboulder communities (Lancaster 2010) present in the site. There is an area, in the northern portion of rMCZ 11, which extends further seawards than the low water mark, to incorporate an important black guillemot feeding and loafing area. This is an additional feature that has been recommended for designation within rMCZ 11, which will compliment the RSPB reserve / SSSI protection that is afforded around the cliffs of St Bees Head. Another additional (non-ENG) feature in rMCZ 11 is the narrow leafed eelgrass *Zostera angustifolia* which occurs on the high energy intertidal rocky shore area, present in the northern part of the site (Brodie et al .2007). Intertidal rock around St Bees head is recognisable as areas of red sandstone. This habitat type is rare throughout the Irish Sea and is only found in two other rMCZs within the ISCZ project region. The algal community around this rocky shore is diverse and the rarity of this habitat type through the region, and the associated algal community that it supports, has warranted the proposal of this feature for protection in rMCZ 11.

# 9. Detailed site description

rMCZ 11 is recommended to protect a range of intertidal features which occur around and south of St Bees Head. As part of a mixed management initiative, an area extending between 500 m and 1 km from the high water mark around St Bees Head, which are important for a non-ENG feature, the seabird black guillemot *Cepphus grylle*, has also been proposed for designation.

The Cumbrian coast, including rMCZ 11 is relatively unusual in so far as there is detailed information on the ecology of the intertidal areas of rocky shore. These areas have been surveyed annually since 1993 through work commissioned by the Cumbria Sea Fisheries Committee (Lancaster 2010).From these survey data, in combination with the JNCC Marine Nature Conservation Review, which surveyed intertidal sites from Liverpool Bay up to the Solway Firth, the following habitat features are evident in rMCZ 11: high energy intertidal rock, intertidal sand and muddy sand, intertidal biogenic reefs, high energy infralittoral rock blue mussel beds, honeycomb worm *Sabellaria alveolata* reefs, and peat and clay exposures (Lancaster 2010, Covey et al. 1998, Seeley et al. 2010).

The Cumbrian coast is noted for having the UKs most extensive and best representative examples of honeycomb worm *Sabellaria alveolata* reefs The Solway Firth represents the northerly limit of *Sabellaria alveolata* reefs. Individually, these tube dwelling worms cement together sand grains to form the structure in which they live. Collectively these structures are important to sediment dynamics and they also support a range of other species. Similarly, the blue mussel beds fulfill a similar biogenic reef function, by providing shelter for other species, such as the periwinkles, dog whelks and algae recorded in and around the areas of blue mussel beds in rMCZ 11(Lancaster 2010). The intertidal underboulder communities in this area are also notably diverse. Beadlet anemones *Actinia equina*, purse sponges *Sycon ciliatum*, horn wrack *Flustra folicacea*, starfish *Asterias rubens*, long and broad clawed crabs *Pisidia longicornis* and *Porcellana platycheles*, keel worms *Pomatoceros lamarcki*, shore crabs and dahlia anemone *Urticina feline* were all recorded (Lancaster 2010).

Peat and clay exposures are visible along parts of the southern portion of rMCZ 11 (Hazell 2008 used in Seeley et al. 2010). A UKBAP priority habitat, the key species associated with peat and clay exposures are piddocks, a type of burrowing bivalve, (*Pholas dactylus*, *Barnea candida* and *Barnea parva*). The fact that these exposures are an irreplaceable habitat type (they are composed of former lake bed sediments and ancient forested peatland (termed 'submerged forests') underlies their ecological significance, but also their archaeological interest.

The rocky shore habitat present around St Bees Head is one of the most exposed rocky shores on the Cumbrian coast (Lancaster 2010) and is a rare habitat type throughout the ISCZ project region. the intertidal zone, a range of algal species have been recorded. Dulce (a red algae) and Irish Moss can be found on the lower shore, in the mid shore zone red seaweeds, bladder wrack and fucus are present, whilst spiral and egg wrack are common on the upper shore (Lancaster 2010). The red sandstone that makes up the rocky shore is an important area for algae, such as narrow leafed eelgrass *Zostera angustifolia* (Brodie et al. 2007), and as such, this has become an additional feature to be recommended for designation with rMCZ 11.

Finally, on the cliffs of St Bees Head, there is a large colony of seabirds (estimated at 10,000 breeding pairs). The cliffs themselves are part of a RSPB nature reserve and also have SSSI status. As such, the terrestrial component of the seabirds habitat is protected, but the sea just offshore from St Bees Head is not. Seabirds use the waters off St Bees head for feeding and maintenance, which includes behavioural activities like preening, congregating and loafing (Gouldstone pers comm. 2011). The motivation for including waters off St Bees Head centres around the black guillemot which nests on the cliffs. This is a bird species which is not listed as Annex 1 or a migratory species under the Birds Directive, however St Bees is a nationally important site for this species, as this is the only breeding colony of black guillemots in England. The RSG agreed to this 500 m extension (offshore from the original boundary which was 500 m from the high water mark) of rMCZ 11 off St Bees head to include black guillemots as a non-ENG feature for this site. However, crucially, this area will not be designated to protect the underlying broad-scale habitats or FOCI.

Site identification work was supported by knowledge and data for several important seabird species. In addition to the species proposed for designation (including Black Guillemot), rMCZ 11 is an important area for seabirds in the Irish Sea providing a foraging and loafing ground to a wide range of species. These include: guillemots (*Uria aalge*), razorbill (*Alca torda*) and puffins (*Fratercula arctica*), and will originate from English and Scottish colonies (Gouldstone pers comm. 2011).

The RSPB and other natural environment stakeholders have noted that this site is key to a wide range of seabird species which utilise the locally rare, rocky habitats and breeding clifs. Locally, guillemots (*Uria aalge*) feed on sandeel, herring and sprat; puffins (*Fratercula arctica*) feed on sandeel and capelin; razorbill (*Alca torda*) feed on sandeel, herring and sprat (Gouldstone pers comm. 2011).

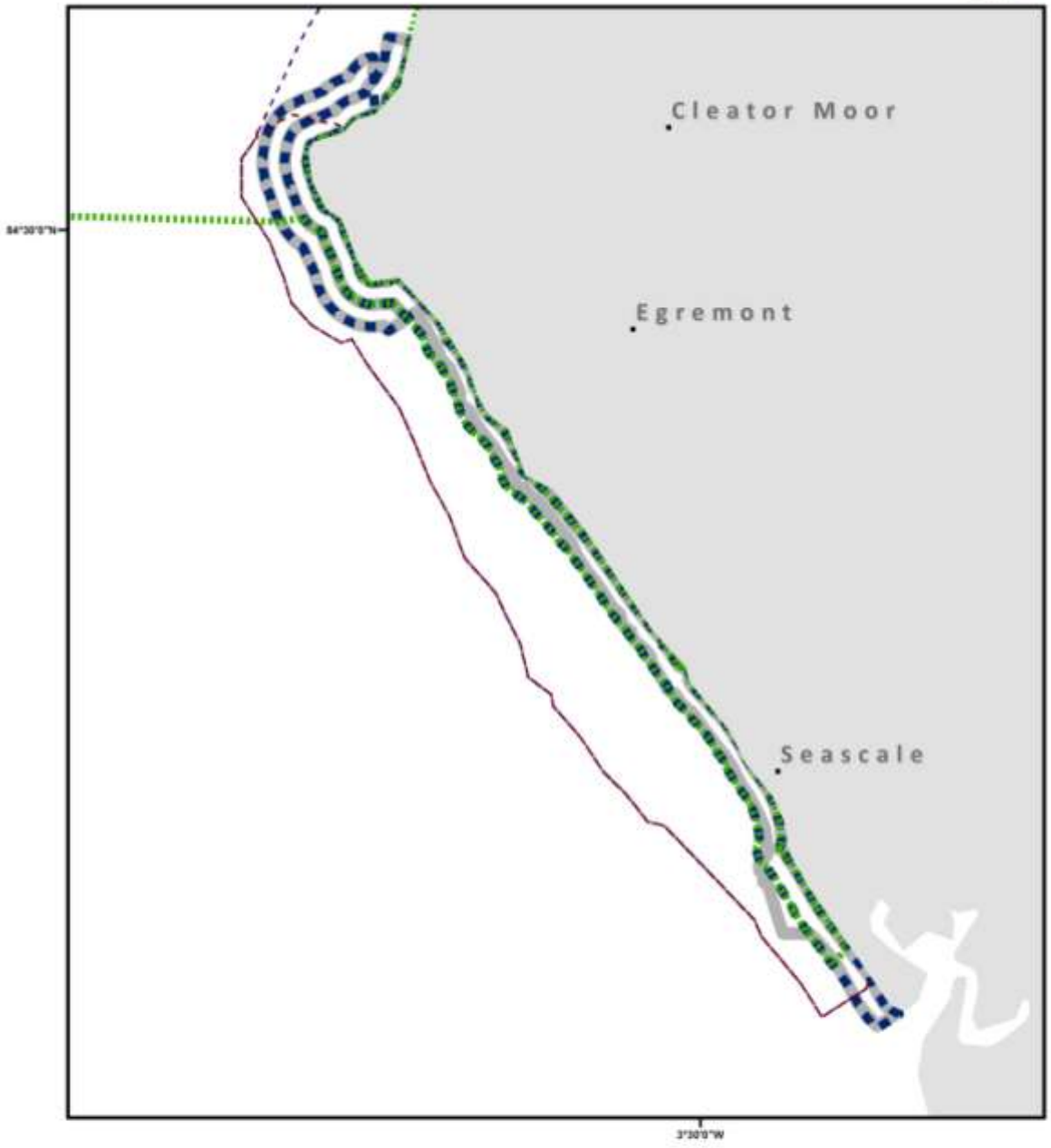
The RSG agreed that the south east boundary of rMCZ 11, just south of Seascale, be extended in order to encompass the full extent of Barn Scar and Kokoarrah Rocks. These two cobble and boulder scars are particularly diverse in marine life. The under boulder communities are varied support a profusion of life. Species such as: barnacles, common limpets, beadlet anemones, tube worms, encrusting sponges, bryozoans, sea squirts, periwinkles, topshells, whelks, sea urchins, some starfish, common shore crabs, shrimps and blennies can all be found. The lower shore exhibits seaweeds such as sugar kelp and oarweed and toothed wrack *Fucus serratus*, spiral wrack *Fucus spiralis* and bladder wrack *Fucus vesiculosus* which

often aggregate between and on boulders. Under the canopy of seaweeds rocks are covered with byrozoans and hydroids, barnacles and ross worm *Sabellaria alveolata* crusts. (Lancaster 2010, Lumb pers.comm. 2011). Mid shore Barn Scar to Drigg coast has some persistent scar areas with small honeycomb worm *Sabellaria alveolata* mounds and mussels *Mytilus edulis* (Lancaster, 2010).

## 10. Site boundary

This site originally emerged in the second and third iterations as a site that encompassed a large Broad Area of Interest which extended far offshore. For the draft final recommendations the offshore component of the site was removed to leave a strip that ran along the Cumbrian coast and extended 500 m seaward from the mean high water mark. For the final recommendations components of the site extended seawards so that the full intertidal zone was proposed for designation. This was felt to be more practical for management and more ecologically beneficial, as areas such as Barn Scar and Kokoarrah were included in the network.

# rMCZ 11- Iteration 1- Final Recommendations




0 1.25 2.5 5 Km

Final Recommendations
Draft Final Recommendations
Iteration 3
Iteration 2 Option A
Iteration 2 Option B
Iteration 1

Map in Relation to UK

## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ maintain | Subject to natural change, **maintain** the **High Energy Intertidal Rock** to favourable condition, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **High Energy Intertidal Rock** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** 3 Pressures | **High Energy Intertidal Rock** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Water clarity changes* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, no additional management is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change **maintain** the **Peat and Clay Exposures**, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Peat and Clay Exposures** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3 Pressures | **Peat and Clay Exposures** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Atmospheric climate change*<br>• *Temperature changes - regional/national*<br>• *Emergence regime changes - local*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, no additional management is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change **maintain** the ***Mytilus edulis* (Blue Mussel) Beds**, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Mytilus edulis* (Blue Mussel) Beds** in the biogeographic region are all **maintained** such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3 Pressures | ***Mytilus edulis* (Blue Mussel) Beds** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water clarity changes* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, no additional management is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **recover** the ***Sabellaria alveolata* (Honeycomb Worm) Reef** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the ***Sabellaria alveolata* (Honeycomb Worm) Reef** in the biogeographic region are all **recovered**. |
| **Advice on operations**<br>3<br>Pressures | ***Sabellaria alveolata* (Honeycomb Worm) Reef** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• *Surface abrasion: damage to seabed surface features*<br>• *Physical change (to another seabed type*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - local*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Temperature changes - regional/national*<br>• *Water flow (tidal current) changes - local*<br>• *Siltation rate changes (high)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, management of hand collection for flora and fauna in the vicinity of the Sabellaria Alveolata reefs is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **recover** the **Intertidal Biogenic Reefs**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Intertidal Biogenic Reefs** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3<br>Pressures | **Intertidal Biogenic Reefs** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• Removal of non-target species (lethal)<br>• Removal of target species (lethal)<br>• *Surface abrasion: damage to seabed surface features*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Physical change (to another seabed type)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Temperature changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Water flow (tidal & ocean current) changes - regional/national*<br>• *Water flow (tidal current) changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, management of hand collection for flora and fauna in the vicinity of the Littoral Biogenic Reefs is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **maintain** the **Intertidal Under Boulder Communities**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Intertidal Under Boulder Communities** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3<br>Pressures | **Intertidal Under Boulder Communities** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Siltation rate changes (high)*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes - regional/national*<br>• *Emergence regime changes - local*<br>• *Salinity changes - local*<br>• *Siltation rate changes (low)*<br>• *Temperature changes - local*<br>• *Water flow (tidal current) changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, no additional management is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **maintain** the **Intertidal Sand and Muddy Sands**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **Intertidal Sand and Muddy Sands** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3<br>Pressures | **Intertidal Sand and Muddy Sands** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Siltation rate changes (low)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Salinity changes - local*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes – local* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, no additional management is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ maintain | Subject to natural change, **recover** the **High Energy Infralittoral Rock**, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br>representative of the **High Energy Infralittoral Rock** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3<br>Pressures | **High Energy Infralittoral Rock** is sensitive to the pressures: (feature not exposed to pressures in *Italics*)<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Removal of target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Surface abrasion: damage to seabed surface features*<br>• *Temperature changes - regional/national*<br>• *Salinity changes - local*<br>• *Water clarity changes*<br>• *Introduction or spread of non-indigenous species & translocations (competition)* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, management of static gear in the vicinity of the High Energy Infralittoral Rock is required to protect this feature. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **maintain** the ***Cepphus grille*** **(Black Guillemot),** such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>natural environmental quality*, and natural environmental processes*<br>representative of the ***Cepphus grille*** **(Black Guillemot),** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations**<br>3<br>Pressures | ***Cepphus grille*** **(Black Guillemot),** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• *Noise (including vibration)*<br>• *Visual presence*<br>• *Selective extraction - fishing and overfishing - and bycatch* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. Based on an assessment of current activities that take place in the site, further monitoring is required to ascertain if any additional management is required to protect this feature. |

## 12. Sites to which this site is related

rMCZ 11 lies approximately 23 km to the east of rMCZ 1. Within rMCZ11 lies the existing St. Bees Head SSSI site. To the south, the boundaries of rMCZ11 also overlap with another designated Natura site in the Drigg coast SAC. rMCZ 2 lies 40 km to the south and encompasses the Duddon estuary SAC.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of high energy intertidal rock / intertidal underboulder communities | Shore transect surveys | MESH, Covey et al. 1998, Lancaster 2010 |
| Intertidal sand and muddy sand | Shore transect surveys | MESH, Covey et al. 1998, Lancaster 2010 |
| Intertidal biogenic reefs (blue mussel beds and honeycomb worm *Sabellaria alveolata* reefs) | Shore transect surveys | MESH, Covey et al. 1998, Lancaster 2010 |
| High energy infralittoral rock | Shore transect surveys | MESH, Covey et al. 1998, Lancaster 2010 |
| Peat and clay exposures | Survey data | Hazell 2008 used in Seeley et al. 2010 |
| Location of species narrow leaved eelgrass *Zostera angustifolia* | Specialist knowledge provided by the SAP | Brodie et al .2007 |
| Black guillemot *Cepphus grylle* | RSPB data | Gouldstone pers. comm.. 5th April 2011 |

## References

BRODIE, J., TITTLEY, I., HOLMES, M.J, & WILLIAMSON, D. 2007. Important Plant Areas for algae: a provisional review of sites and areas of importance for algae in the United Kingdom. Plantlife International, Salisbury, UK.

COVEY, R., FORTUNE, F., NICHOLS, D.M. & THORPE, K. 1998. *Marine Nature Conservation Review. Sector 11. Liverpool Bay and the Solway Firth: area summaries*. Peterborough, Joint Nature Conservation Committee. (Coasts and seas of the United Kingdom. MNCR series

HAZELL, Z. 2008. *Offshore and intertidal peat deposits, England – a resource assessment and development of a database*. Environmental Archaeology **13**: 101-110.

LANCASTER, J. 2010. *Cumbrian Sea Fisheries Committee shore survey*. Solenvo Marine Environmental Consultants.

SEELEY, B., LEAR, D., HIGGS, S., NEILLY, M., BILEWITCH, J., EVANS, J., WILKES, P. & ADAMS, L. 2010. *Accessing and developing the required biophysical datasets and data layers for Marine Protected Areas network planning and wider marine spatial planning purposes*. Report No 16: Task 2C. Mapping of Protected Habitats. DEFRA Project Code: MB0102 Marine Biodiversity R&D Program.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT RMCZ13 SEFTON COAST

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ13 - Sefton Coast (zone abuts onto recommended reference area Z).

## 2. Site centre location

rMCZ 13:
53° 32' 9.831" N, 3° 5' 50.897" W
53.536064 Lat, -3.097471 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

rRA Z:
53° 31' 1.472" N, 3° 3' 48.717" W
53.517075 Lat, -3.063532 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

13.19 $km^2$ (1318.95 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

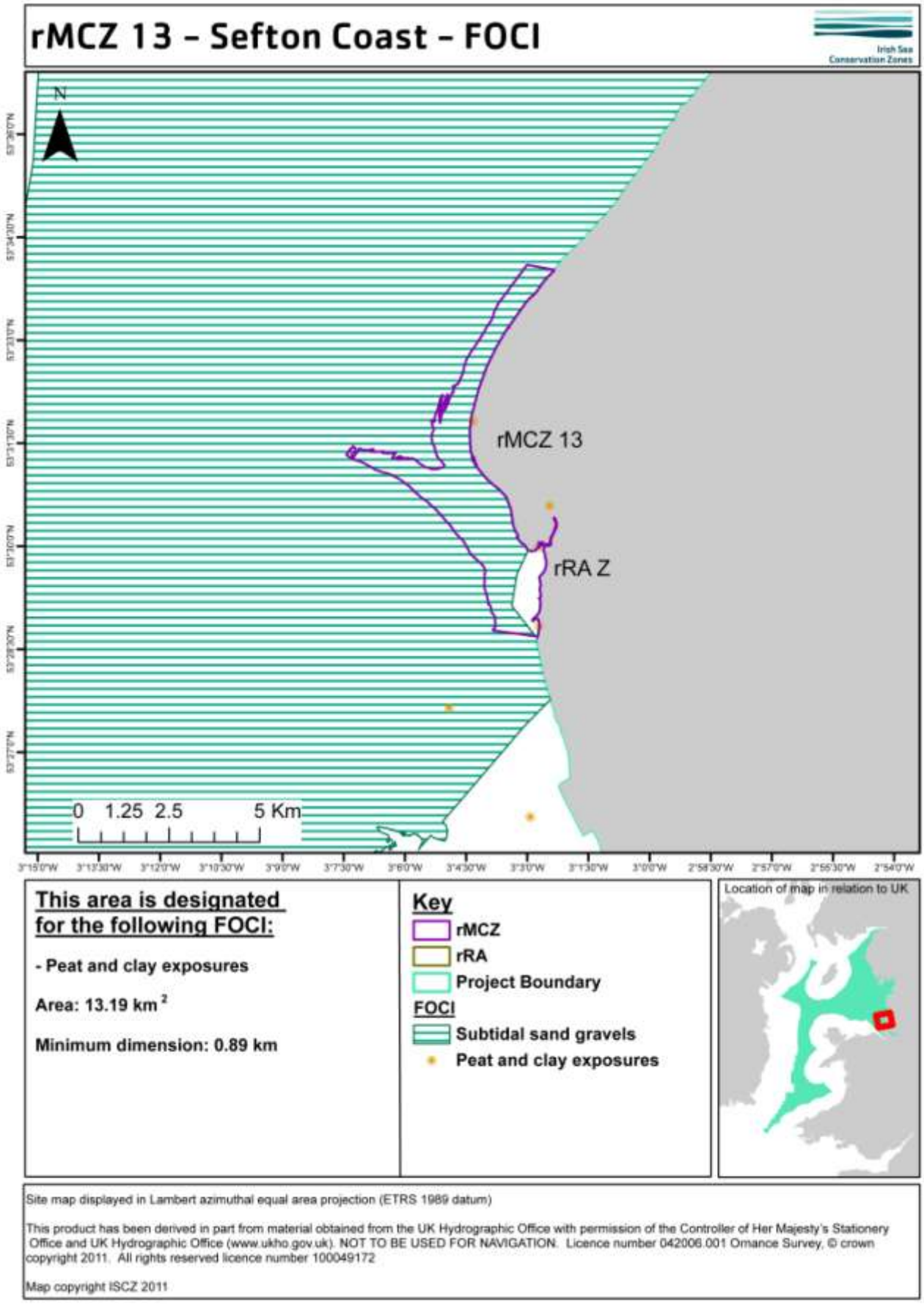
## 5. Features proposed for designation within rMCZ13

| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | Peat and clay exposures | Please note: rMCZ13 is being designated for peat and clay only as it significantly improved stakeholder support |
| Species of conservation importance | n/a | |
| Geological feature | n/a | |
| Other feature | n/a | |
| | | |

# 6. Features within rMCZ13 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal sand and muddy sand | Designation not required as covered by the gap analysis |
| | Intertidal mud | Designation not required as covered by the gap analysis |
| | Coastal saltmarshes and saline reedbeds | Does not require extra protection as stipulated in the ENG |
| | Subtidal sand | Not designated as this is an intertidal site |
| Habitat of conservation importance | Subtidal sands and gravels | Not designated as this is an intertidal site |
| Species of conservation importance | | |

## 7. Map of site


rMCZ 13 – Sefton Coast – FOCI
Irish Sea Conservation Zones
N
rMCZ 13
rRA Z
0 1.25 2.5 5 Km
3°15'0"W 3°13'30"W 3°12'0"W 3°10'30"W 3°9'0"W 3°7'30"W 3°6'0"W 3°4'30"W 3°3'0"W 3°1'30"W 3°0'0"W 2°58'30"W 2°57'0"W 2°55'30"W 2°54'0"W
This area is designated for the following FOCI:
- Peat and clay exposures
Area: 13.19 km²
Minimum dimension: 0.89 km
Key
rMCZ
rRA
Project Boundary
FOCI
Subtidal sand gravels
Peat and clay exposures
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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Map copyright ISCZ 2011

# rMCZ 13- Sefton Coast Boundary - v1.0


Bounding co-ordinates:

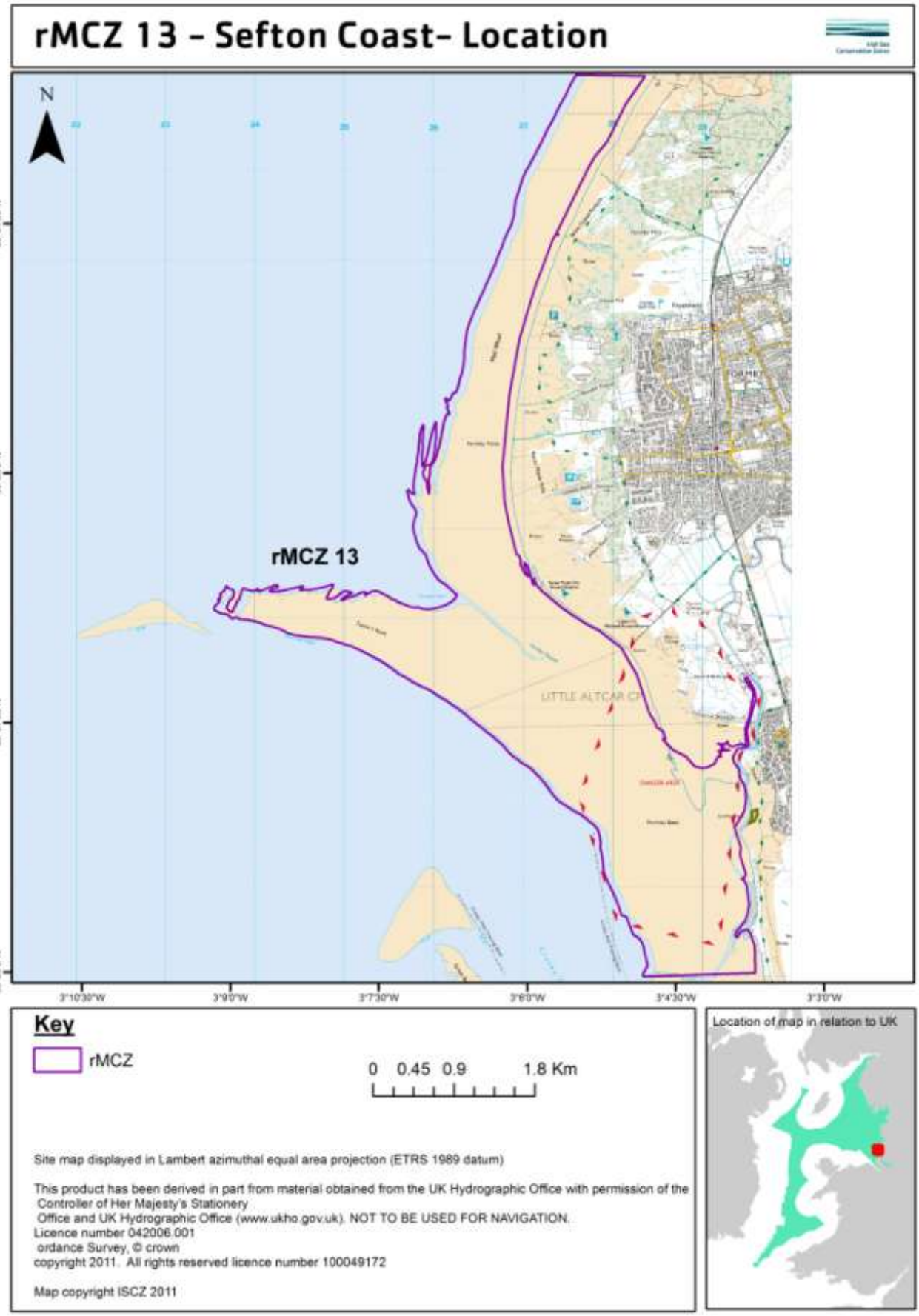
1: 53° 35' 27.065" N, 3° 5' 38.702" W
2: 53° 35' 26.973" N, 3° 4' 57.016" W
3: 53° 30' 3.937" N, 3° 3' 41.833" W
4: 53° 30' 2.099" N, 3° 4' 49.315" W
5: 53° 32' 11.786" N, 3° 9' 12.986" W
6: 53° 32' 20.543" N, 3° 9' 5.836" W
7: 53° 32' 18.699" N, 3° 6' 46.062" W

**Legend**

Depth (m)

- Intertidal
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- >200


Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)


rMCZ 13 – Sefton Coast– Location
N
rMCZ 13
53°34'0"N
53°33'0"N
53°32'0"N
53°31'0"N
3°10'30"W
3°9'0"W
3°7'30"W
3°6'0"W
3°4'30"W
3°3'0"W
Key
rMCZ
0 0.45 0.9 1.8 Km
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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Map copyright ISCZ 2011
Location of map in relation to UK

## 8. Site summary

rMCZ 13 is situated on the Sefton coast between Formby Point and Crosby beach. The site is situated in the intertidal zone, and extends from the mean high water mark to the mean low water mark. rMCZ 13 is proposed for designation for the habitat feature of conservation importance peat and clay exposures. Benthic habitats formed from exposed peat or clay, or in some cases both, are uncommon and provide important habitats for a variety of species such as: burrowing bivalves (including piddocks), seaweeds and crabs (NBN Gateway 2011). In clay rich areas common mussels, periwinkles and polychaete worms have also been noted. This habitat feature is also of archaeological interest, as the exposures are composed of former lake bed sediments and ancient forested peatland. The exposures off Formby Point contain preserved animal and human footprints which date back to the stone age (Roberts et al. 1996). Designation as an MCZ could protect these prehistoric landscapes from the threats posed by erosion, development or recreational pressure.

## 9. Detailed site description

Peat and clay exposures are a priority habitat for the UKBAP and, although they are of ecological interest for the habitat they provide for a range of species, they are also of archaeological interest and importance.

The peat and clay exposures present in rMCZ 13 have been verified with data from English Heritage and peer-reviewed records from the British Geological Society (primarily the Hazell 2008 database) (Seeley et al. 2010).

Protecting these peat and clay exposures will help fulfil the UK commitments to biodiversity through the UKBAP, for which peat and clay exposures are designated as a priority habitat. Records of piddocks, a type of burrowing bivalve (*Pholas dactylus*, *Barnea candida* and *Barnea parva*), which are key species for this habitat type have also been confirmed from the National Biodiversity Network (NBN Gateway, 2011). These exposures are an irreplaceable habitat type, as they are composed of former lake bed sediments and ancient forested peatland (also referred to as 'submerged forests') (Maddock 2010).

Peat and clay exposures can be subject to occasional inundation and emergence from sediments. Depending on the level of sand scour present, the surface of peat exposures can be covered with algal mats made of red and green seaweeds (*Ceramium* sp. and *Ulva lactuca* and *Ulva intestinalis*). Hydroids can be present within small pools of water and crabs shelter within crevices e.g. *Carcinus maenas* and *Cancer pagurus* (Maddock 2010). On the surface of clay exposures, there tends to be less seaweed coverage, instead small clumps of blue mussels *Mytilus edulis* can be present, alongside barnacles and periwinkles *Littorina littorea*, whilst polychaete worms live within the clay, e.g. *Polydora* sp. and *Hediste diversicolor* (Maddock 2010). Both peat and clay exposures are soft enough to be burrowed into by piddocks *Pholas dactylus*, and the holes created by these burrowing bivalves provides an important micro-habitat for species such as crabs and anemones, e.g. the daisy anemone (*Cereus pedunculatus*) and the gem anemone (*Aulactinia verrucosa*) (Maddock 2010).

In addition to the ecological reasons for protecting this habitat type, the peat beds found on this part of the coast are superb regional examples of peat deposits containing preserved remnants of submerged forests and human and animal footprints that date back to the stone age (Figure 1; Roberts et al. 1996). Over the last 20 years, 145 trails of human footprints and animal tracks from, for example, roe deer, crane and

unshod horses have been recorded in the peat exposures at Formby Point. These footprints date back to the late Mesolithic to mid Neolithic era.

The intertidal peat beds along this stretch of coast do not receive protection from the Sefton coast SAC or SSSI, and therefore designating these as a feature for a marine conservation zone could provide protection against erosion, recreational activities (such as bait digging) and development.

Figure 12 extensive peat bed along the Sefton Coast. 

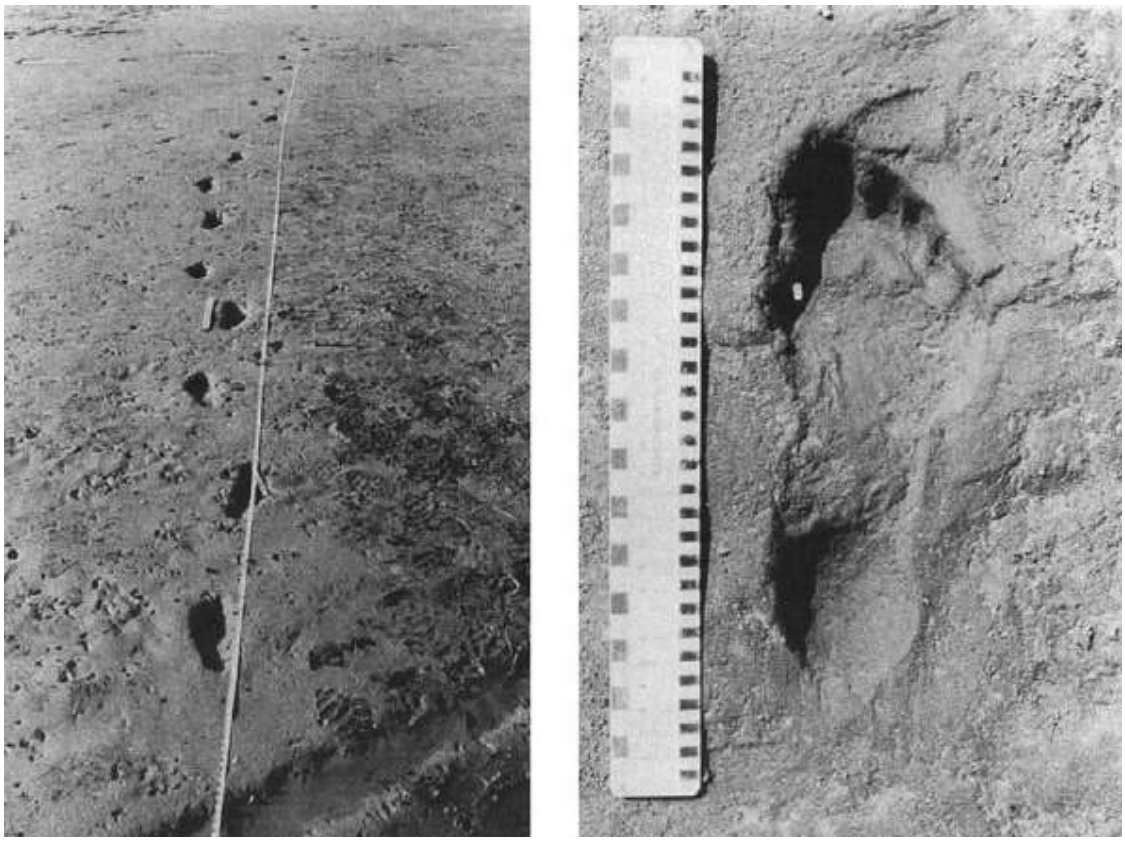


Figure 2. Holocene footprints in the mudflats off Formby Point (Roberts et al. 1996)

## 10. Site boundary

This site is located within the Sefton coast SAC. It first emerged in this broad location in the third iteration (it was previously positioned further north, but this had poor stakeholder support). For the draft final and final recommendations, the site boundary has extended seawards so that it overlaps fully with the seaward boundary of the Sefton Coast SAC, as this was thought to be more practical in terms of future marine management. The development of the site boundary through time can be seen on the below map.

# 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **recover** the **Peat and Clay Exposures** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Peat and Clay Exposures** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | **Peat and Clay Exposures** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Physical change (to another seabed type)<br>• Physical loss (to land or freshwater habitat)<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Atmospheric climate change*<br>• *Temperature changes - regional/national*<br>• *Emergence regime changes - local*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

rMCZ 13 is adjacent to the Liverpool Bay SPA and situated within the Sefton Coast SAC/ SSSI. These designations offer no specific management measures to protect the peat and clay exposures, which is the main reason why the site has been recommended for designation.

As this site is being recommended for the designation of a habitat feature, and one that is primarily of archaeological interest, rather than a broad-scale habitat type, the distances between this rMCZ and other rMCZs within the region, which also contain peat and clay exposures, was not considered and is not reported here.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of peat and clay exposures | Survey | Hazell for British Geological Survey (2008) |
| Location of peat and clay exposures | Photographic study | Roberts et al. (1996) |

## 14. Stakeholder considerations

***Caveats:***

- That the site is proposed for designation of the FOCI Peat and Clay exposures only.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Anne x3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most to all stakeholders accepted the inclusion of rMCZ13 in the final network in order to satisfy the ENG targets. The majority of concerns about this site were raised by the recreation sector, but these were alleviated on receipt of guidance on management.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References

HAZELL, Z. 2008. *Offshore and intertidal peat deposits, England – a resource assessment and development of a database*. Environmental Archaeology **13**: 101-110.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

MADDOCK, A. 2010. *UK Biodiversity Action Plan; Priority Habitat Descriptions*. BRIG (ed. Ant http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsRevised20100730.pdf[Accessed 14 March 2011]

National Biodiversity Network (NBN Gateway). 2011. Available at: http://data.nbn.org.uk/ [Last accessed: 6 April 2011]

ROBERTS, G., GONZALEZ, S. & HUDDART, D. 1996. *Intertidal Holocene footprints and their archaeological significance.* Antiquity **70**: 647-651.

SEELEY, B., LEAR, D., HIGGS, S., NEILLY, M., BILEWITCH, J., EVANS, J., WILKES, P. & ADAMS, L. 2010. *Accessing and developing the required biophysical datasets and data layers for Marine Protected Areas network planning and wider marine spatial planning purposes*. Report No 16: Task 2C. Mapping of Protected Habitats. DEFRA Project Code: MB0102 Marine Biodiversity R&D Program.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT RMCZ14 HILBRE ISLAND GROUP

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 14 - Hilbre Island Group

## 2. Site centre location

53° 22' 38.363" N, 3° 13' 3.799" W
53.377323 Lat, -3.217721 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

4.49 $Km^2$ (448.92 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

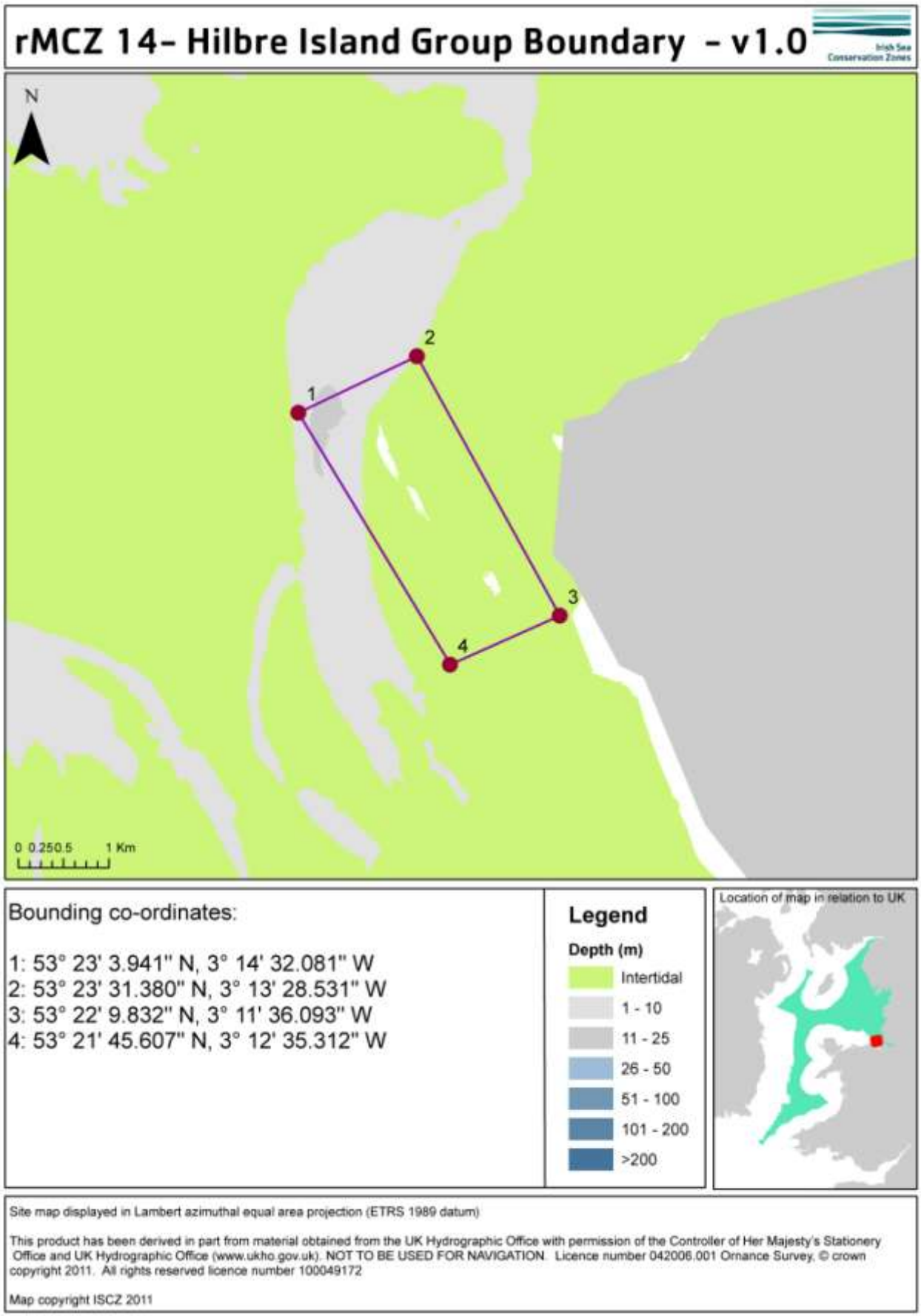
## 5. Features proposed for designation within rMCZ 14

| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | A2.7 Intertidal biogenic reefs | 0.46 $Km^2$ (45.76 Ha) (note: this is designated by default as the HOCI *Mytilus edulis* is being designated) |
| Habitat of conservation importance | Blue mussel *(Mytilus edulis)* beds<br>Peat and clay exposures | 0.02 $Km^2$ (1.64 Ha)<br><br>0.02 $Km^2$ (1.96 Ha) |
| Species of conservation importance | | |
| Geological feature | n/a | |
| Other feature | n/a | |

# 6. Features within rMCZ 14 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal sand and muddy sand<br>Subtidal sand<br>Subtidal mud<br>Moderate energy infralittoral rock<br>Moderate energy intertidal rock | Covered by the gap analysis<br><br>The RSG requested to keep this site for FOCI only as the inclusion of broad-scale habitat types would increase its size significantly and therefore have greater management implications. |
| Habitat of conservation importance | Estuarine Rocky Habitats<br>Honeycomb worm Sabellaria alveolata reefs | Covered by gap analysis<br><br>Sufficient coverage, already protected by SAC |
| Species of conservation importance | | |

## 7. Map of site


rMCZ 14– Hilbre Island Group Boundary – v1.0
Irish Sea Conservation Zones
N
1
2
3
4
0 0.250.5 1 Km
Bounding co-ordinates:
1: 53° 23' 3.941" N, 3° 14' 32.081" W
2: 53° 23' 31.380" N, 3° 13' 28.531" W
3: 53° 22' 9.832" N, 3° 11' 36.093" W
4: 53° 21' 45.607" N, 3° 12' 35.312" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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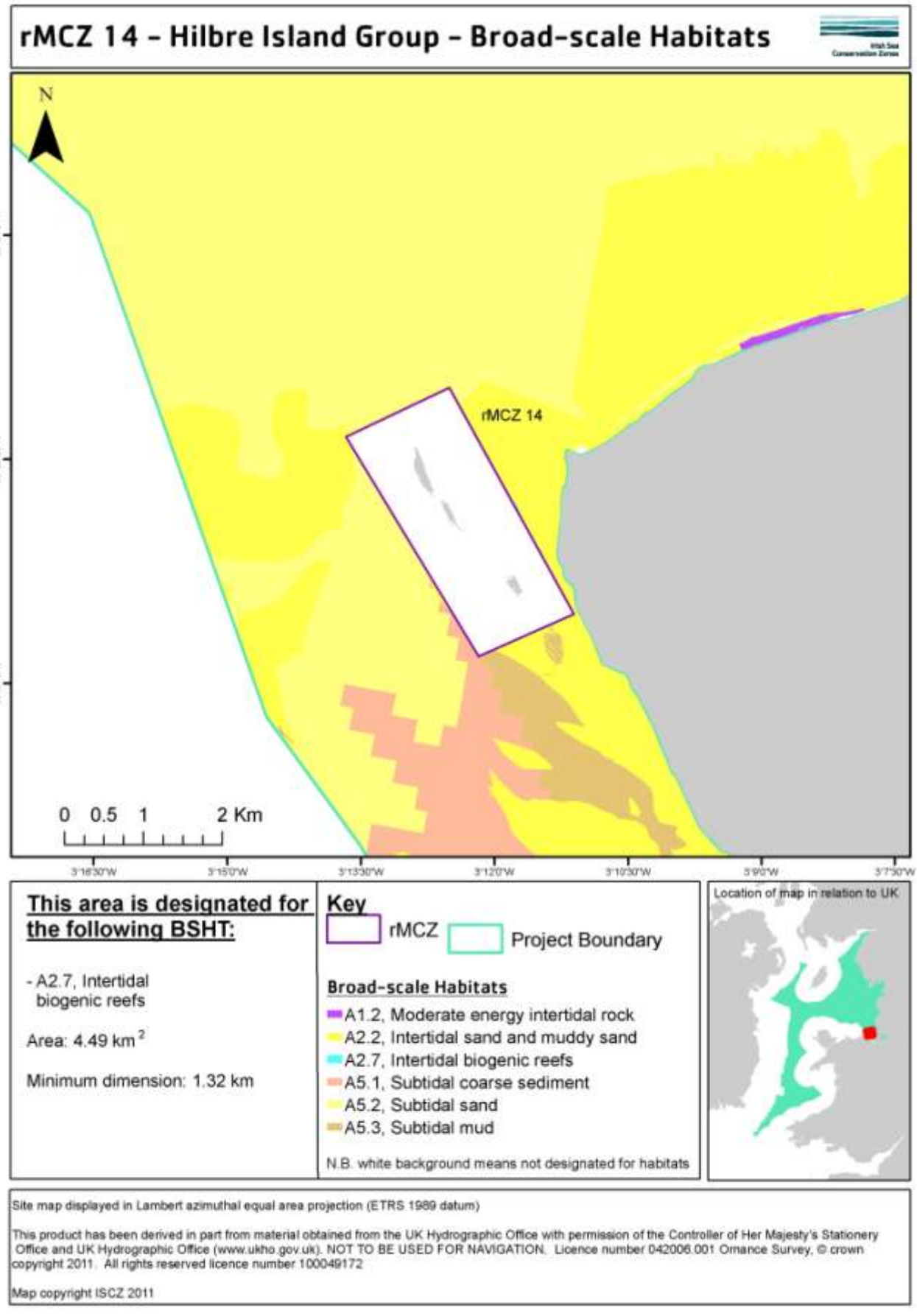
rMCZ 14 – Hilbre Island Group – Broad-scale Habitats
N
rMCZ 14
0 0.5 1 2 Km
53°24'0"N
53°22'30"N
53°21'0"N
3°16'30"W
3°15'0"W
3°13'30"W
3°12'0"W
3°10'30"W
3°9'0"W
3°7'30"W
This area is designated for the following BSHT:
- A2.7, Intertidal biogenic reefs
Area: 4.49 km 2
Minimum dimension: 1.32 km
Key
rMCZ
Project Boundary
Broad-scale Habitats
A1.2, Moderate energy intertidal rock
A2.2, Intertidal sand and muddy sand
A2.7, Intertidal biogenic reefs
A5.1, Subtidal coarse sediment
A5.2, Subtidal sand
A5.3, Subtidal mud
N.B. white background means not designated for habitats
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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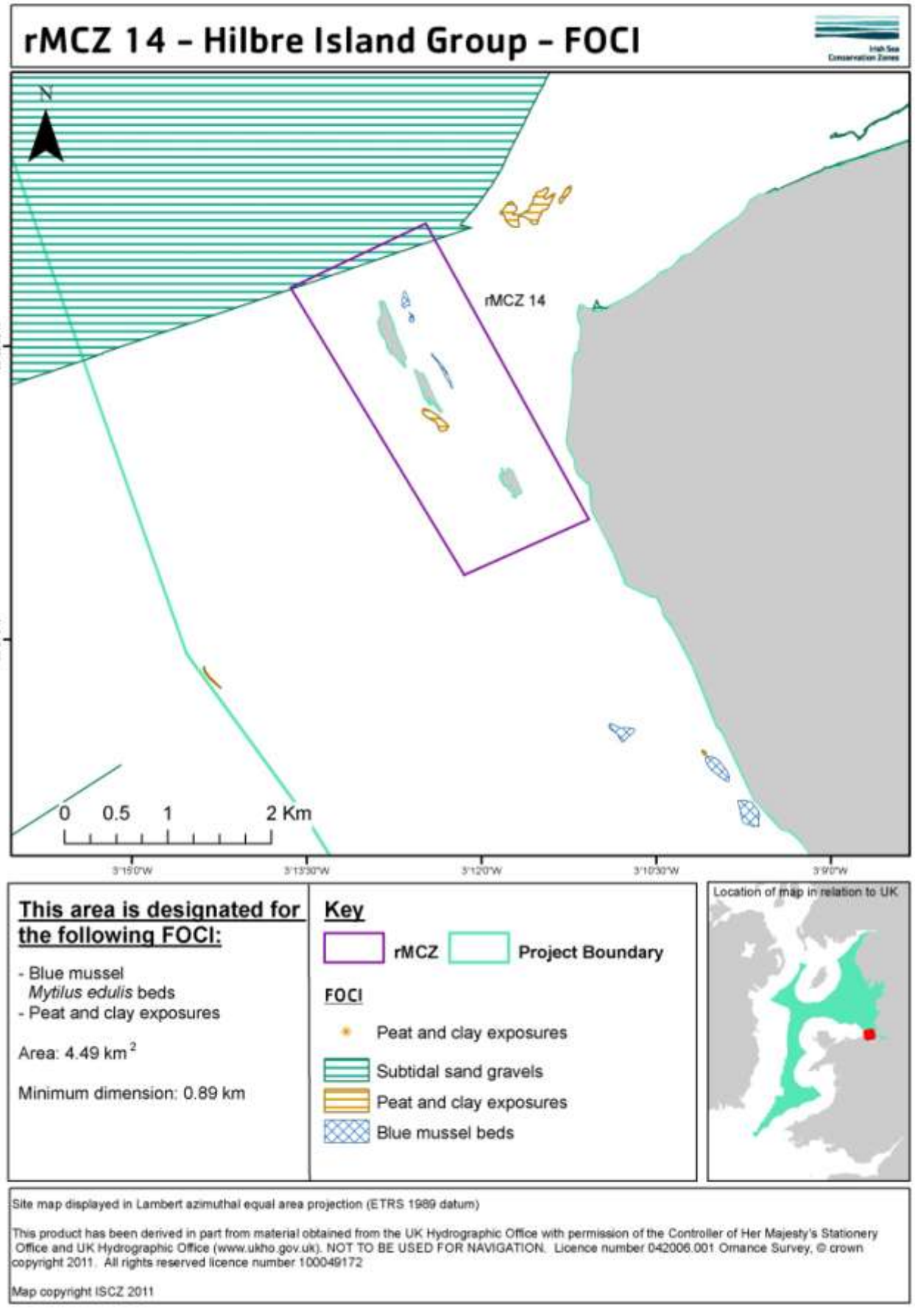
Map copyright ISCZ 2011




Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

rMCZ 14 surrounds an archipelago of three islands; Little Eye, Middle Eye (also known as Little Hilbre) and Hilbre Island. The islands are located at the mouth of the estuary of the River Dee, approximately 1 km from high water mark at the town of West Kirby on the Wirral peninsula. The islands are connected to the mainland at low tide, when they can be accessed by foot. This is a popular activity with tourists, especially in the summer months. The islands are surrounded to the northwest by a 5-10 m deep channel which is believed to have been formed towards the end of the last Ice Age. At 4.5 $km^2$ in area, rMCZ 14 is the smallest proposed site in the ISCZ project area. It overlaps with a SSSI, SAC, SPA and a local nature reserve (LNR). The nearest site to rMCZ 14 is rMCZ 13; the two sites are separated by a distance of only 13 km. The area is being considered for two habitat features of conservation importance (FOCI) only. These are blue mussel *Mytilus edulis* beds and peat and clay exposures.

## 9. Detailed site description

rMCZ 14 surrounds an archipelago of three islands; Little Eye, Middle Eye (also known as Little Hilbre) and Hilbre Island. The islands are located at the mouth of the estuary of the River Dee, approximately 1 km from high water mark at the town of West Kirby on the Wirral peninsula. This area is proposed for designation of two habitat features of conservation importance (FOCI) - blue mussel *Mytilus edulis* beds and peat and clay exposures. As these are FOCI, rather than broad-scale habitat types, the boundary lines currently meet the minimum viable patch of 0.5 km in diameter (Ecological Network Guidance, 2010).

Peat and clay exposures are present within rMCZ 14. This has been verified with data from the DEFRA commissioned MB102 contract based on a CCW survey in 2002. Records of piddocks (*Barnea candida* and *Barnea parva*) which are key species for this habitat type, have also been confirmed from the National Biodiversity Network (NBN Gateway, 2011).

When protected, peat and clay exposures, will help fulfill the UK commitments to biodiversity through the UKBAP, for which peat and clay exposures are designated as a priority habitat. These exposures are an irreplaceable habitat type, as they are composed of former lake bed sediments and ancient forested peatland (also referred to as 'submerged forests') (Maddock 2010). Peat and clay exposures can be subject to occasional inundation and emergence from sediments. Depending on the level of sand scour present, the surface of peat exposures can be covered with algal mats made of red and green seaweeds (*Ceramium* sp. and *Ulva lactuca* and *Ulva intestinalis*). Hydroids can be present within small pools of water and crabs shelter within crevices e.g. *Carcinus maenas* and *Cancer pagurus* (Maddock 2010). On the surface of clay exposures, there tends to be less seaweed coverage, instead small clumps of blue mussels *Mytilus edulis* can be present, alongside barnacles and periwinkles *Littorina littorea*, whilst polychaete worms live within the clay, e.g. *Polydora* sp. and *Hediste diversicolor* (Maddock 2010). Both peat and clay exposures are soft enough to be burrowed into by piddocks *Pholas dactylus*, and the holes created by these burrowing bivalves provides an important micro-habitat for species such as crabs and anemones, e.g. the daisy anemone (*Cereus pedunculatus*) and the gem anemone (*Aulactinia verrucosa*) (Maddock 2010).

Blue mussel *Mytilus edulis* beds are the second habitat feature of conservation importance (FOCI) present in rMCZ 14. The presence of blue mussel beds around this rMCZ are confirmed from records on the National Biodiversity Network (NBN Gateway, 2011). When considering blue mussel beds, it is important to distinguish between blue mussels themselves, which are commonly found around all UK coasts, and blue mussel *beds*. As a habitat FOCI, blue mussel beds only refers to natural beds found over a variety of sediments, this excludes artificially created mussel beds and mussel beds that occur over rocks and

boulders (Ecological Network Guidance, 2010). Beds of blue mussels are found on the mid to lower shore on a mixture of substrates, but primarily cobbles and pebbles on muddy sediments, sand and mud. At high densities (over 30%) mussels bind to the soft substrate providing a natural habitat for other flora and fauna (OSPAR Commission 2008).

Blue mussel beds support a varied biological community. They are considered to be biogenic reefs which are defined as being 'solid massive structures which are created by accumulations of organisms, usually arising from the seabed clearly forming a substantial, discrete community or habitat which is very different from the surrounding seabed' (Holt et al. 1998). Blue mussel beds provide a stable, hard substrate in areas of otherwise soft sediments or unstable rocky ground; this underlies their ecological importance. They stabilise the sediment forming hard structures to which other sessile (or immobile) organisms can attach and provide a heterogenous or varied surface structure. For example, crevices which give shelter to other animals, and the accumulated faeces and associated sediments is an important food source for other species (Holt et al. 1998).

There are a number of additional habitat features of conservation importance (honeycomb worm (*Saballaria alveolata*) reefs, intertidal mudflats and estuarine rocky habitats) which also occur within this proposed site, however as they already receive protection through the existing SSSI, SAC and SPA they are not included as a feature within this rMCZ. Moderate energy intertidal rock is a broad-scale habitat type which occurs within rMCZ14. This is a habitat type which is rare in the project region and one that is restricted to the coast. This habitat type is not proposed for designation in rMCZ14 as the RSG were nervous about the management implications that this may introduce (they were satisfied with the implications associated with the proposed designation for FOCI only). Three studies in the 1970s recorded the seaweed communities present on the rocky shores of Hilbre Island (Russell 1972a, 1972b and 1977). Due to a combination of the limited availability of rocky substrate and the large tidal range, the intertidal communities can be split between two zones, one on the higher shore level which contains *Prasiola stipitata*, *Blidingia minima*, *Lyngbya* spp.: all green seaweeds which grow in patches on rock, while on the lower shore, the acorn barnacle *Elminius modestus* and Fucus species, brown algae can be found (Russell 1972a). Laminarians or kelp species which were historically present have disappeared from this area and the reasons for this has been attributed to pollution and / or siltation from the estuary (Russell 1972a).

## 10. Site boundary

This site emerged in the second iteration as a large site that covered the lower Dee estuary and north Wirral foreshore. The site reduced significantly in size when planning the third iteration following an updated gap analysis and wider stakeholder feedback. The subsequent, much smaller, site boundary was designed to be sufficient in size to meet the principle of viability, but to be no larger than the minimum viable size for the FOCI features within it, as quoted in the ENG. The final recommendation boundary simply squared off the draft final (curved) boundary for perceived ease of future marine management.

# 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1 Maintain/ recover | Subject to natural change **recover** the **Peat and Clay Exposures** to favourable condition by 2020 and maintain thereafter, such that: |
| 2 Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the **Peat and Clay Exposures** in the biogeographic region are all **recovered,** such that the feature makes its contribution to the network |
| **Advice on operations** | |
| 3 Pressures | **Peat and Clay Exposures** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Structural abrasion/penetration: Structural damage to seabed >25mm<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Atmospheric climate change*<br>• *Temperature changes - regional/national*<br>• *Emergence regime changes - local*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Siltation rate changes (high)*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national* |
| 4 Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change **recover** the ***Mytilus edulis* (Blue Mussel) Beds** to favourable condition by 2020 and maintain thereafter, such that: |
| 2<br>Attributes and parameters | the<br>• extent,<br>• diversity,<br>• community structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Mytilus edulis* (Blue Mussel) Beds** in the biogeographic region are all **recovered**, such that the feature makes its contribution to the network |
| **Advice on operations** | |
| 3<br>Pressures | ***Mytilus edulis* (Blue Mussel) Beds** is sensitive to the pressures: (feature is not currently exposed to pressures in *Italics)*<br>• Surface abrasion: damage to seabed surface features<br>• Removal of target species (lethal)<br>• Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm<br>• *Physical loss (to land or freshwater habitat)*<br>• *Siltation rate changes (high)*<br>• *Atmospheric climate change*<br>• *Emergence regime changes - local*<br>• *Introduction or spread of non-indigenous species & translocations (competition)*<br>• *Physical change (to another seabed type)*<br>• *Physical removal (extraction of substratum)*<br>• *Removal of non-target species (lethal)*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Temperature changes - regional/national*<br>• *Wave exposure changes - local*<br>• *Wave exposure changes - regional/national*<br>• *Emergence regime changes (sea level) - regional/national*<br>• *Siltation rate changes (low)*<br>• *Temperature changes – local*<br>• *Water clarity changes* |
| 4<br>Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

rMCZ 14 is located within the Dee Estuary this area is covered by a number of designations including SAC,SPA and SSSI. The Site also abuts on to the Liverpool Bay SPA.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Blue mussel (*Mytilus edulis*) beds | Data and ecological survey | DEFRA commissioned MB102 contract |
| Peat and clay exposures | Data and ecological survey | DEFRA commissioned MB102 contract based on CCW survey in 2002 |
| Piddocks (*Barnea candida* and *Barnia parva*) | Data and ecological survey | DEFRA commissioned MB102 contract |

## 14. Stakeholder considerations

***Caveats:***

- That the site is proposed for designation of the FOCI Blue Mussel Beds (and associated underlying subtidal biogenic reefs) and Peat and Clay exposures only.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most to all stakeholders accepted the inclusion of rMCZ 14 in the final network in order to satisfy the ENG targets. Concerns were initially raised by the commercial fishing sector but these were alleviated on receipt of guidance on management.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References


Holt T. et al. 1998. Biogenic Reefs (volume IX). An overview of dynamic and sensitivity characteristics for conservation management of marine SACs. Scottish Association for Marine Science (UK Marine SACs Project).

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

Maddock A. 2010. UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsRevised20100730.pdf

NBN Gateway. 2011. National Biodiversity Network [online] Available at http://data.nbn.org.uk/ [Accessed 6 April 2011]

OSPAR Commission.2008. Case reports for the OSPAR list of threatened and/ or declining species and habitats.

Russell G. 1972a. Phytosociological studies on a two-zone shore. I. Basic pattern. J. Ecol. 60: 539-45.

Russell G. 1972b. Phytosociological studies on a two-zone shore. II. Community structure. J. Ecol. 61: 525-536.

Russell G. 1977. Vegetation on rocky shores at some North Irish Sea sites. J. Ecol. 65: 485-495.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT RMCZ 15 SOLWAY FIRTH

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 15 - Solway Firth

## 2. Site centre location

54° 55' 40.611" N, 3° 15' 3.776" W
54.927947 Lat, -3.251048 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

45.72 $Km^2$ (4572.06 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

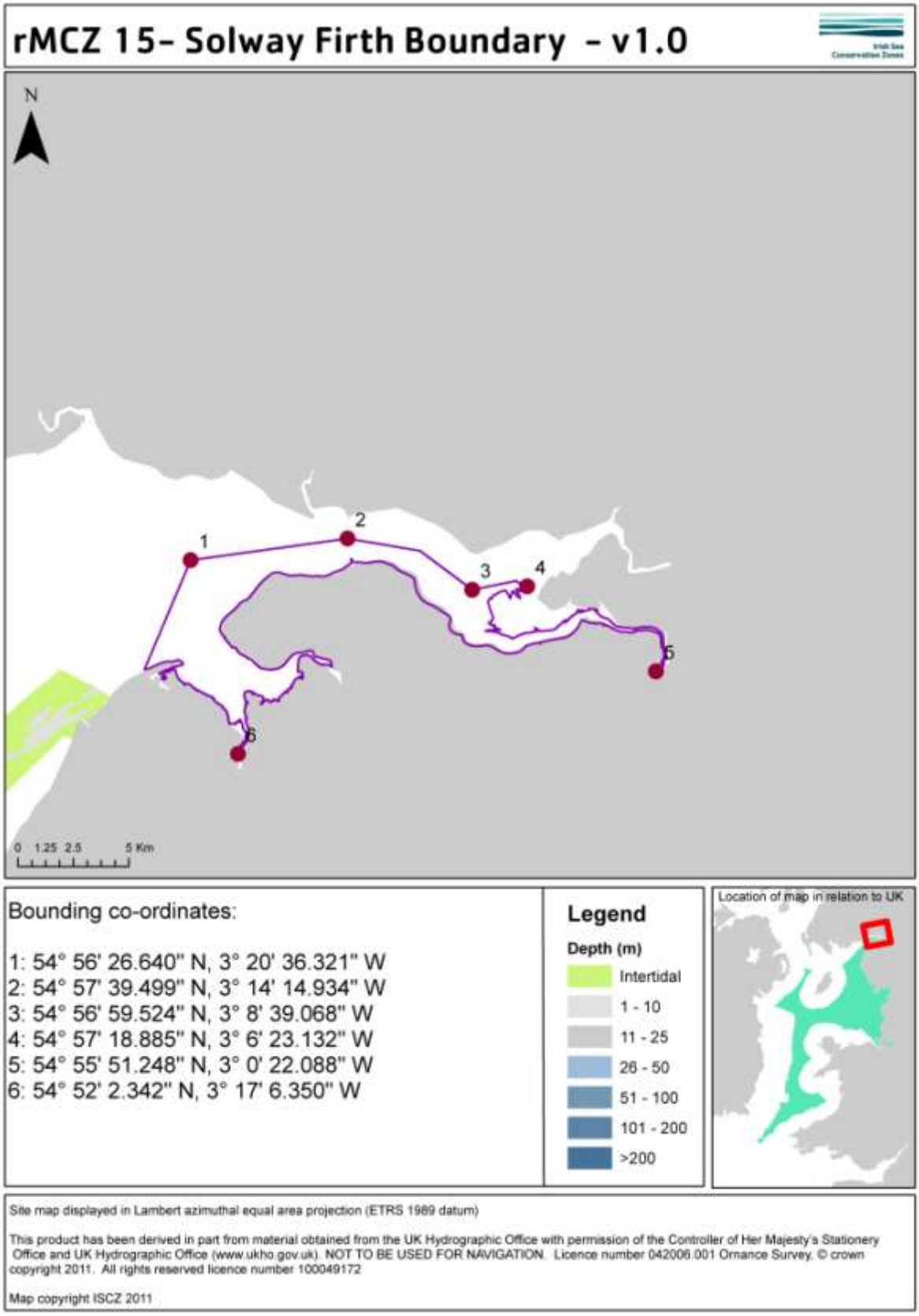
## 5. Features proposed for designation within rMCZ 15

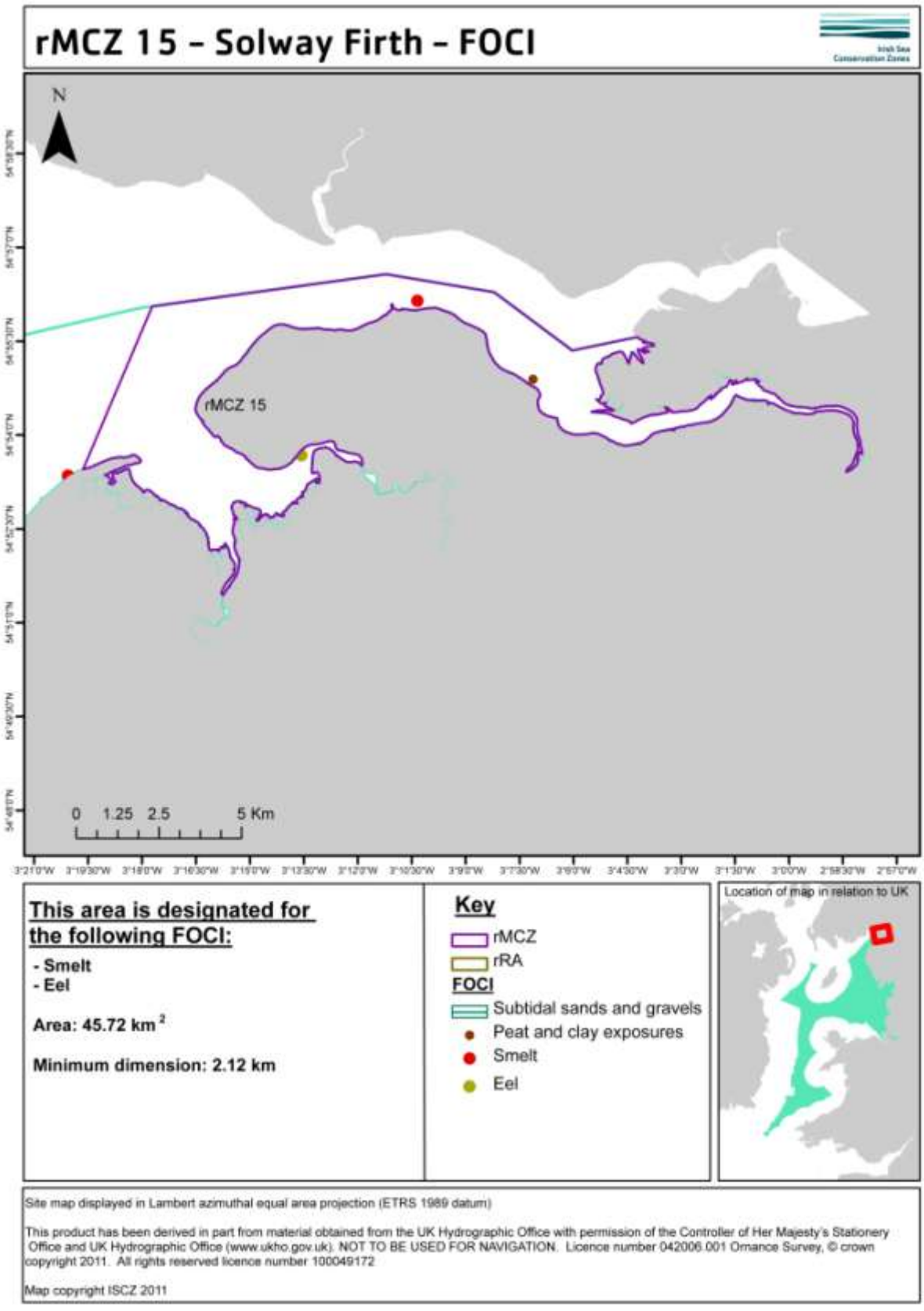
| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | Smelt (*Osmerus eperlanus)*<br>European eel (*Anguilla Anguilla)* | |
| Geological feature | n/a | |
| Other feature | n/a | |

# 6. Features within rMCZ 15 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Low energy intertidal rock<br>Intertidal sand and muddy sand<br>Intertidal mud<br>Intertidal mixed sediments<br>Coastal saltmarshes and saline reedbeds<br>Subtidal coarse sediment<br>Subtidal sand<br>Subtidal mud<br>Subtidal mixed sediments | Solway Firth MCZ falls within the Solway Firth SAC.<br><br>The MCZ is proposed to protect highly mobile species only, Smelt (*Osmerus eperlanus)* and Eel (*Anguilla anguilla*). |
| Habitat of conservation importance | Blue mussel (*Mytilus edulis)* beds<br>Sheltered muddy gravels<br>Subtidal sands and gravels | The MCZ is proposed to protect highly mobile species only, Smelt (*Osmerus eperlanus)* and Eel (*Anguilla anguilla*). |
| Species of conservation importance | | |

## 7. Map of site


rMCZ 15- Solway Firth Boundary - v1.0
N
1
2
3
4
5
6
0 1.25 2.5 5 Km
Bounding co-ordinates:
1: 54° 56' 26.640" N, 3° 20' 36.321" W
2: 54° 57' 39.499" N, 3° 14' 14.934" W
3: 54° 56' 59.524" N, 3° 8' 39.068" W
4: 54° 57' 18.885" N, 3° 6' 23.132" W
5: 54° 55' 51.248" N, 3° 0' 22.088" W
6: 54° 52' 2.342" N, 3° 17' 6.350" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey. © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011


rMCZ 15 – Solway Firth – FOCI
Irish Sea Conservation Zones
N
rMCZ 15
0 1.25 2.5 5 Km
This area is designated for the following FOCI:
- Smelt
- Eel
Area: 45.72 km 2
Minimum dimension: 2.12 km
Key
rMCZ
rRA
FOCI
Subtidal sands and gravels
Peat and clay exposures
Smelt
Eel
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
This product has been derived in part from material obtained from the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office and UK Hydrographic Office (www.ukho.gov.uk). NOT TO BE USED FOR NAVIGATION. Licence number 042006.001 Ornance Survey, © crown copyright 2011. All rights reserved licence number 100049172
Map copyright ISCZ 2011

## 8. Site summary

Solway Firth rMCZ is located in the Solway Firth in the northeastern Irish Sea. The site extends from the shore to the middle of the estuary where the devolved administrative boundaries of Scottish waters begin. This rMCZ completely falls within the Solway Firth SAC, which already protects many of the benthic features throughout the site, such as the coastal saltmarsh habitat which is an important nursery area for a range of fish species, including bass. The rMCZ has been selected as a representative area where there are records of both spawning smelt *Osmerus eperlanus* (upstream) and of European eel *Anguilla Anguilla* (Environment Agency TRAC monitoring data, 2011). On a national level, both smelt and eel have been subject to declines in abundance. Historically, smelt were common in the Solway and were the target of a large fishery. Little is known about the current abundance of eel in the Solway but, based on their ubiquitous distribution across river estuaries in the UK, they are likely to be present here. Smelt and eel are already afforded protection from the existing fisheries management regulations (IFCA bylaws) that are in place to conserve river and sea lamprey and salmon. The Solway Firth rMCZ could protect these two species against future pressures.

## 9. Detailed site description

Information presented here comes from an estuary workshop that the Environment Agency organised with an expert panel led by Dr Sarah Peet.

The Solway Firth rMCZ includes the upper region of the Solway Firth, where spawning smelt have been recorded. Smelt are caught by the Environment Agency during Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys. The smelt stock in the Solway is believed to be isolated, as this species is intolerant of salty water, so those recorded here are confined to brackish water in the Solway estuary complex. Historically, smelt were highly abundant and there used to be a large Solway smelt fishery, but today this population is considered to be almost non-existant. Spawning has been recorded in the upper regions of the estuary (upstream of Old Sandfields), and juveniles of various sizes have been caught; this is indicative of a breeding population.

Little is known about the distribution or abundance of eel in the Solway Firth Estuary. However, they are present and there is believed to be an elver run up the estuary. Historically, fyke nets were used to catch seaward migrating silver eel in the Solway. Within the estuary, elvers here await the optimal conditions that trigger their migration into freshwater. The main issue for elvers in the Solway is access upstream on their migratory route.

Currently, smelt and eel are the only features proposed for designation within the Solway Firth rMCZ. The benthic habitats in the site, such as the coastal saltmarshes, are already protected by the Solway Firth SAC. Nonetheless, the Solway estuary is an important nursery area for smelt and other species of commercial interest such as Bass *Dicentrarchus labrax* and Pollock *Pollachius spp.* and flatfish. The potential importance of this area as a Bass nursery was noted as although this species is believed to be fished at a sustainable level (ref: ICES reports), there is a general acceptance that bass require warmer waters than those within the Solway Firth. The northern limit of this species' range is primarily within the southern half of the UK. Currently, the Solway Firth is the most northerly of the

bass nursery grounds. This may be linked to the gradual increase in summer temperatures of the North Irish Sea as a result of successive mild winters. Therefore, given that their northern extent may change, this places emphasis on the importance of this estuary as a nursery area.

## 10. Site boundary

The boundary of this site was drawn to include the upper region of the estuary where spawning smelt have been recorded. The northerly boundary abuts with the Scottish administrative boundary and the eastern section aligns with an existing IFCA netting restriction boundary. This site was agreed to form part of the draft final recommendations and remained in place for the final recommendations. Its boundary has not changed through time and, as such, there is no accompanying map that shows the development of the site boundary.

## 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Anguilla anguilla*** **(European Eel)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Anguilla anguilla*** **(European Eel)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Anguilla anguilla*** **(European Eel)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Osmerus eperlanus* (Smelt)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Osmerus eperlanus* (Smelt)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Osmerus eperlanus* (Smelt)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

Existing management initiatives in the Solway Firth include an SAC and SSSI. Related estuary sites are over 140 km away. The nearest rMCZ is rMCZ10, which is approximately 25 km to the south.

## 13. Supporting documentation

This section should include the sources of the best available scientific and stakeholder information used to identify sites and conservation objectives presented in a table format:

| Information | Type of information | Source |
|---|---|---|
| Location of smelt | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |
| Location of eel | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |

## 14. Stakeholder considerations

***Caveats:***

- The site was agreed subject to appropriate management measures that allow existing and future cable infrastructure, and that appropriate consideration is given to future wave/tidal devices.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most to all stakeholders accepted the inclusion of rMCZ15 in the final network in order to satisfy the ENG targets. There was a reluctance of some industry stakeholders (marine renewables) to agree to this site until they have assurances in writing from the appropriate regulators.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References

Environment Agency. 2011. *Estuary workshop paper*. Document presented to the Regional Stakeholder Group after an expert panel convened to review smelt and eel in the Irish Sea. Led by Dr Sarah Peet of the Environment Agency. ISCZ, Envirolink, Birchwood 5th April 2011.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 16 WYRE-LUNE

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 16 Wyre-Lune

## 2. Site centre location

53° 58' 0.963" N, 2° 57' 18.823" W
53.966934 Lat, -2.955229 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

92.38 $Km^2$ (9237.424 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

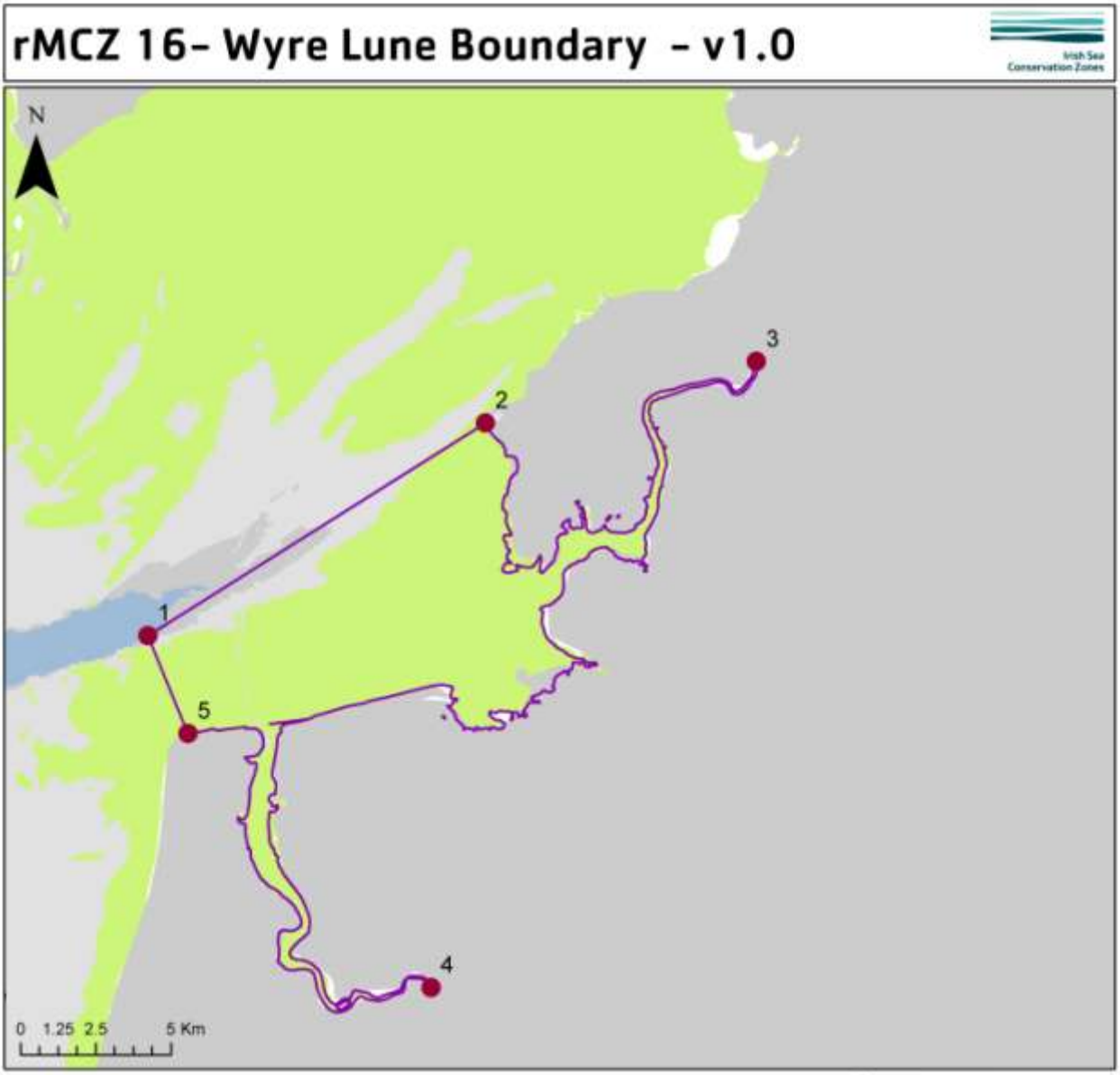
## 5. Features proposed for designation within rMCZ 16

| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | Smelt (*Osmerus eperlanus*) and European eel (*Anguilla anguilla*) | -<br><br>- |
| Geological feature | n/a | |
| Other feature | n/a | |

# 6. Features within rMCZ 16 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal coarse sediments<br>Intertidal sand and muddy sand<br>Intertidal mud<br>Intertidal mixed sediments<br>Moderate energy infralittoral rock<br>Low enrgy infralittoral rock<br>High energy circalittoral rock<br>Subtidal sand<br>Subtidal mud<br>Subtidal mixed sediments<br>Subtidal macrophyte-dominated sediment | The MCZ is proposed to protect highly mobile species only, Smelt (*Osmerus eperlanus)* European eel (*Anguilla anguilla*) |
| Habitat of conservation importance | Subtidal biogenic reefs<br>Blue mussel (*Mytilus edulis*) beds<br>Esturine rocky habitats<br>Sheltered muddy gravels<br>Subtidal sands and gravels | The MCZ is proposed to protect highly mobile species only. |
| Species of conservation importance | | |

## 7. Map of site


rMCZ 16- Wyre Lune Boundary - v1.0
Irish Sea Conservation Zones
N
1
2
3
4
5
0 1.25 2.5 5 Km
Bounding co-ordinates:
1: 53° 57' 0.757" N, 3° 4' 17.981" W
2: 54° 1' 49.600" N, 2° 55' 22.680" W
3: 54° 3' 45.647" N, 2° 47' 36.381" W
4: 53° 51' 44.983" N, 2° 53' 55.513" W
5: 53° 55' 25.831" N, 3° 2' 33.900" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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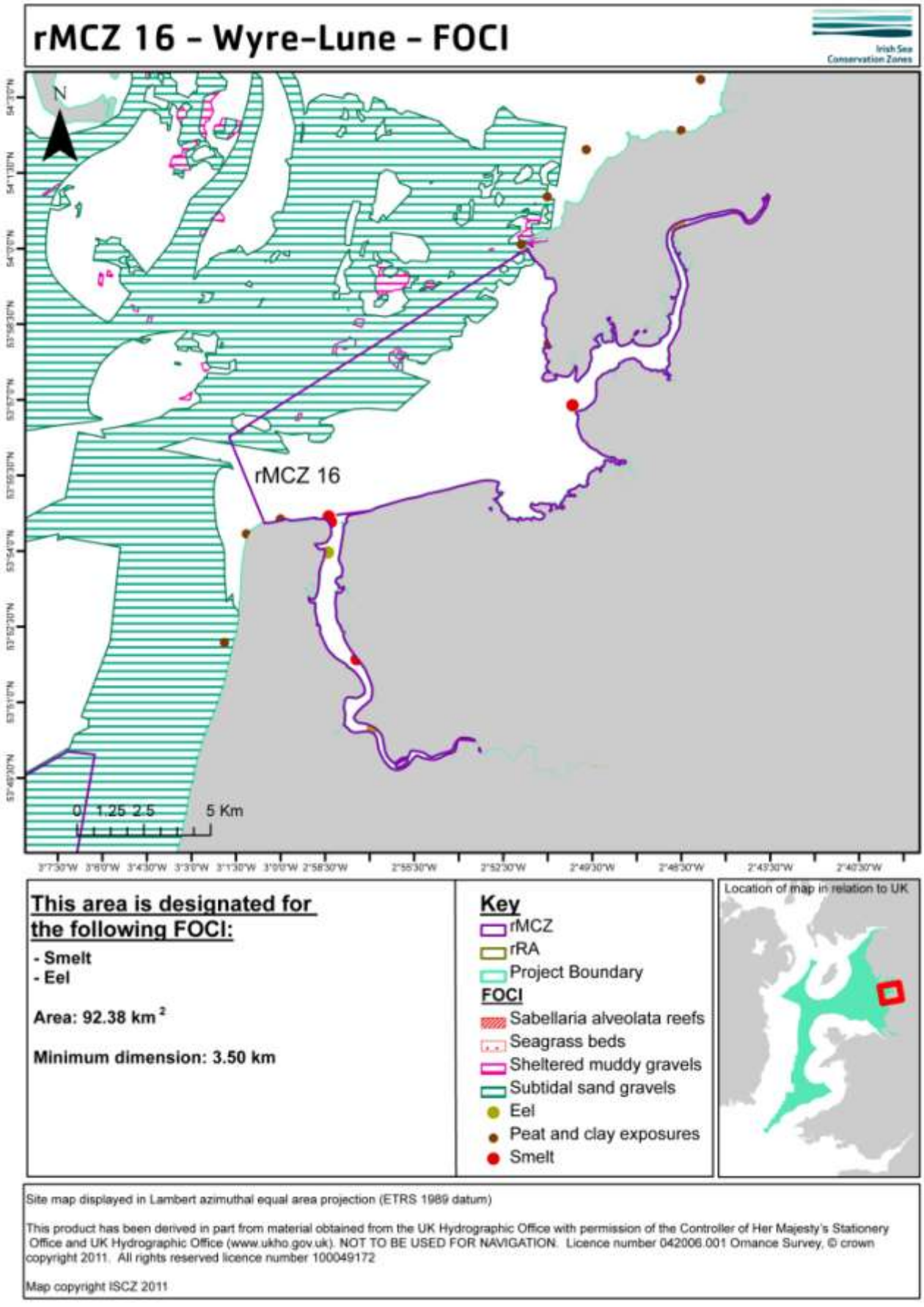
Map copyright ISCZ 2011




Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

This rMCZ is comprised of two estuaries situated within Morecambe Bay, the Wyre and the Lune. The site extends 9 km seawards from the inner shore to the outer sea boundary. The features proposed for designation are two highly mobile species; Smelt (*Osmerus eperlanus*) and European eel (*Anguilla anguilla*). Both estuaries have important saltmarsh habitats which are important fish nursery areas for a range of species. The Lune estuary falls within the Morecambe Bay SAC, which already protects the benthic features throughout the site. The Wyre estuary is not protected by the SAC; the saltmarshes are protected by the SSSI, but this offers a lower level of protection.

## 9. Detailed site description

Information presented here comes from an estuary workshop that the Environment Agency organised with an expert panel led by Dr Sarah Peet of the Environment Agency.

WYRE ESTUARY

There is an actively recruiting smelt (*Osmerus eperlanus*) population in the Wyre Estuary. The Maitland (2003) report indicates that smelt within the Morecambe Bay estuary complex are part of an interconnected population and, therefore, the importance of this spawning stock in the Wyre Estuary was emphasised. There was no specific eel (*Anguilla anguilla*) information or data for the Wyre estuary, but, as with these estuaries more generally, the inability for eels to migrate upstream will be an issue for any eels present.

The ungrazed saltmarsh present in the Wyre estuary was highlighted as being a very representative area of this habitat and one with high floristic diversity. The fact that this is ungrazed is important, as when grazed this reduces the shelter habitat available for fish and can in turn reduce fish utilization by 50%.

Dredging takes place in the creeks of the Wyre and up to the Lune in order to encourage water flow. Previously dredging took place for the Fleetwood ferry, however this has recently been decommissioned. Marine fish stocks may recover as a result of the more stable substrate. Gas storage at Fleetwood may affect salinity of the estuary. The development of the Wyre tidal barrage, which is currently being discussed, would impact the ability of smelt and eel to move upstream. More generally, the effect that the Haysham Power Station has had on local fish populations was highlighted, but new regulations on the monitoring and public reporting on fish captured in the intake pipes are in place. This will serve as an important source of background monitoring data to assess the effect of climate change on fish populations and monitoring of invasive species.

Saltmarsh habitats in the Wyre Estuary are not covered by the Morecambe Bay SAC, they are covered by the SSSI.

Whitebait fisheries which catch smelt as a bycatch are regulated under the IFCA bylaws. Incidental protection is therefore afforded to smelt, but in the 5 year review of these bylaws, smelt specific management measures ought to be considered in collaboration with the Environment Agency who implement the legislation for this freshwater fish.

LUNE ESTUARY

There is only one formal record of smelt (*Osmerus eperlanus*) in this estuary, where the specimen was caught at Abbey Light. The fact that white bait fisheries sometimes catch smelt as bycatch provides anecdotal evidence to support the presence of smelt within this estuary.

There was an elver (*Anguilla anguilla*) fishery which operated on the Lune by the Skerton Weir, but a local bylaw has stopped this fishery. From the one or two fishermen who still catch eel in this area, it seems that they are not caught in any large quantity.

The potential nursery areas in the Lune extend up to the Skerton weir. These nursery grounds are important for herring, sprat and flounder.

Saltmarsh habitats in the Lune Estuary are covered by the Morecambe Bay SAC and SSSI.
Whitebait fisheries which catch smelt as bycatch are regulated under the IFCA bylaws. Incidental protection is therefore afforded to smelt, but in the five year review of this bylaws, smelt specific management measures ought to be considered in collaboration with the Environment Agency who implement the legislation for this freshwater fish.

## 10. Site boundary

The boundary for Wyre and Lune estuary rMCZ encompasses both estuaries and connects them by extending seawards approximately 7 km into Morecambe Bay. The inner estuary boundary aligns with an existing IFCA netting restriction boundary. This site was agreed to form part of the draft final and final recommendations and it remained in place for the final recommendations. Its boundary has not changed through time and, as such, there is no accompanying map that shows the development of the site boundary.

# 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Anguilla anguilla*** **(European Eel)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Anguilla anguilla*** **(European Eel)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Anguilla anguilla*** **(European Eel)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Osmerus eperlanus* (Smelt)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Osmerus eperlanus* (Smelt)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Osmerus eperlanus* (Smelt)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

The Wyre-Lune rMCZ is in the vicinity of the following existing and draft conservation areas that have marine associated features. Vicinity is in this context been defined as a distance less than 80 km. Ribble and Alt Estuaries (SPA) is within 40 km, Morecambe Bay (SPA, SSSI), Drigg coast (SAC) and Duddon estuary (SPA / SSSI) are within 40 km of the Wyre-Lune rMCZ.

## 13. Supporting documentation

| Information | Type of information | Source |
|---|---|---|
| Location of smelt | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |
| Location of eel | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |

## 14. Stakeholder considerations

***Caveats:***

- The site was agreed subject to appropriate management measures that allow existing and future cable infrastructure, and that appropriate consideration is given to future wave/tidal devices.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most to all stakeholders accepted the inclusion of rMCZ16 in the final network in order to satisfy the ENG targets. There was a reluctance of some industry stakeholders (marine renewables) to agree to this site until they have assurances in writing from the appropriate regulators.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References

Environment Agency. 2011. *Estuary workshop paper*. Document presented to the Regional Stakeholder Group after an expert panel convened to review smelt and eel in the Irish Sea. Led by Dr Sarah Peet of the Environment Agency. ISCZ, Envirolink, Birchwood 5th April 2011.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

Maitland, P.S. 2003. The status of the smelt *Osmerus eperlanus* in England. English Nature Research Reports. No. 511 Peterborough, English Nature.

# MARINE CONSERVATION ZONE: SELECTION ASSESSMENT DOCUMENT
# RMCZ 17 RIBBLE ESTUARY

| Version and issue date | Amendments made |
|---|---|
| v1.0 August 2011 | |

## 1. Site name

rMCZ 17 Ribble Estuary

## 2. Site centre location

53° 43' 32.399" N, 2° 54' 49.445" W
53.725666 Lat, --2.913735 Long. Lambert Azimuthal Equal Area projection, ETRS89 datum

## 3. Site surface area

12.7 $Km^2$ (1269.58 Ha)

## 4. Biogeographic region

JNCC regional sea: Irish Sea.
OSPAR region III: Celtic Seas.

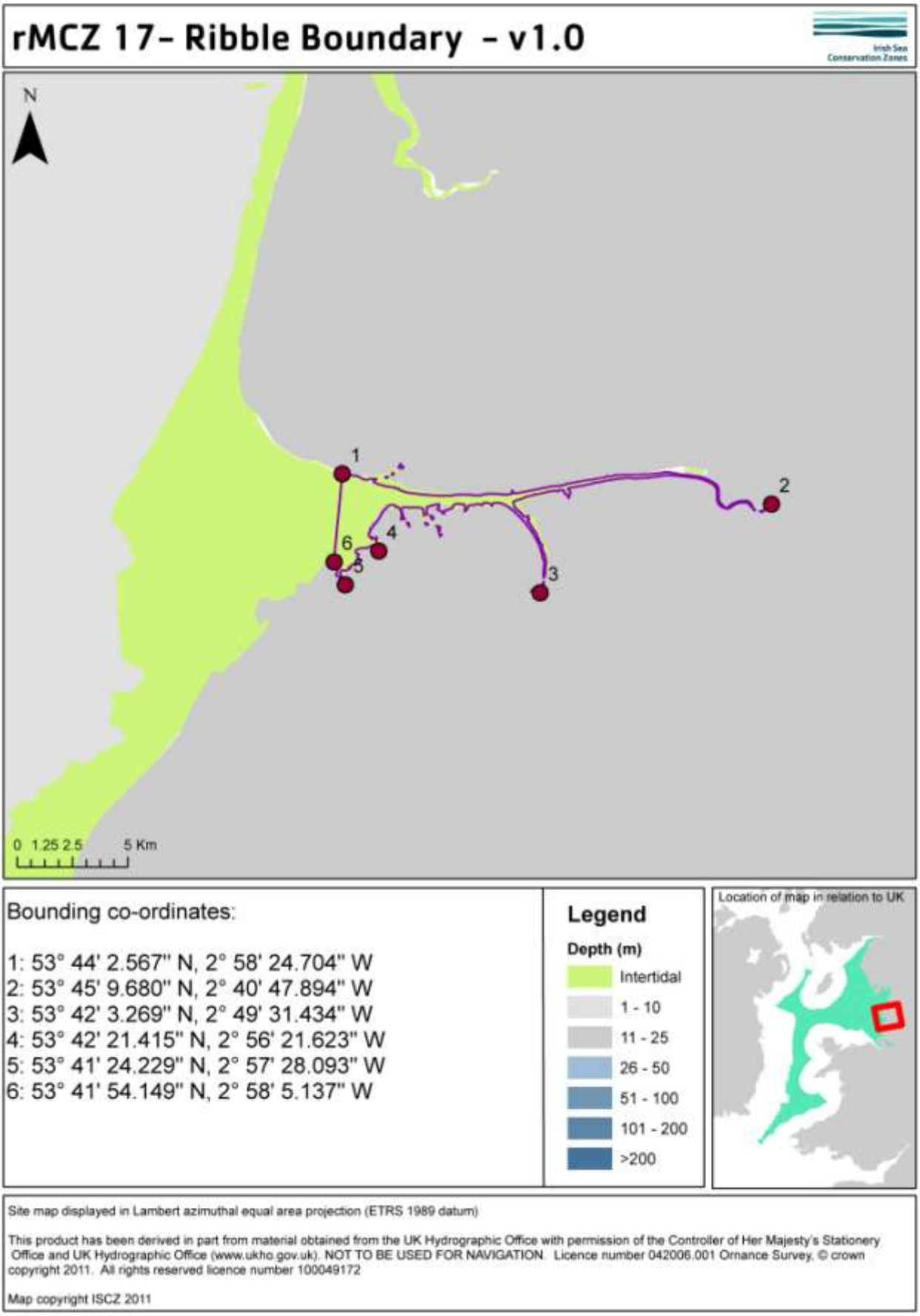
## 5. Features proposed for designation within rMCZ 17

| **Feature type** | **Feature name** | **Area covered within site (for broad scale habitats and habitats of conservation importance)** |
|---|---|---|
| Broad scale habitat | n/a | |
| Habitat of conservation importance | n/a | |
| Species of conservation importance | Smelt (*Osmerus eperlanus)*<br>European eel (*Anguilla Anguilla)* | -<br>- |
| Geological feature | n/a | |
| Other feature | n/a | |

## 6. Features within rMCZ 17 not proposed for designation

| Feature type | Feature name | Reason that feature has not been proposed for designation |
|---|---|---|
| Broad scale habitat | Intertidal sand and muddy sand<br>Intertidal mud<br>Coastal saltmarshes and saline readbeds<br>Subtidal sand<br>Subtidal mud<br>Subtidal mixed sediments | The MCZ is proposed to protect highly mobile species only, Smelt (*Osmerus eperlanus)* and Eel (*Anguilla anguilla*). |
| Habitat of conservation importance | Blue mussel (*Mytilus edulis)* beds<br>Sheltered muddy gravels<br>Subtidal sands and gravels | The MCZ is proposed to protect highly mobile species only |
| Species of conservation importance | | |

## 7. Map of site


rMCZ 17- Ribble Boundary - v1.0
Irish Sea Conservation Zones
N
1
2
3
4
5
6
0 1.25 2.5 5 Km
Bounding co-ordinates:
1: 53° 44' 2.567" N, 2° 58' 24.704" W
2: 53° 45' 9.680" N, 2° 40' 47.894" W
3: 53° 42' 3.269" N, 2° 49' 31.434" W
4: 53° 42' 21.415" N, 2° 56' 21.623" W
5: 53° 41' 24.229" N, 2° 57' 28.093" W
6: 53° 41' 54.149" N, 2° 58' 5.137" W
Legend
Depth (m)
Intertidal
1 - 10
11 - 25
26 - 50
51 - 100
101 - 200
>200
Location of map in relation to UK
Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)
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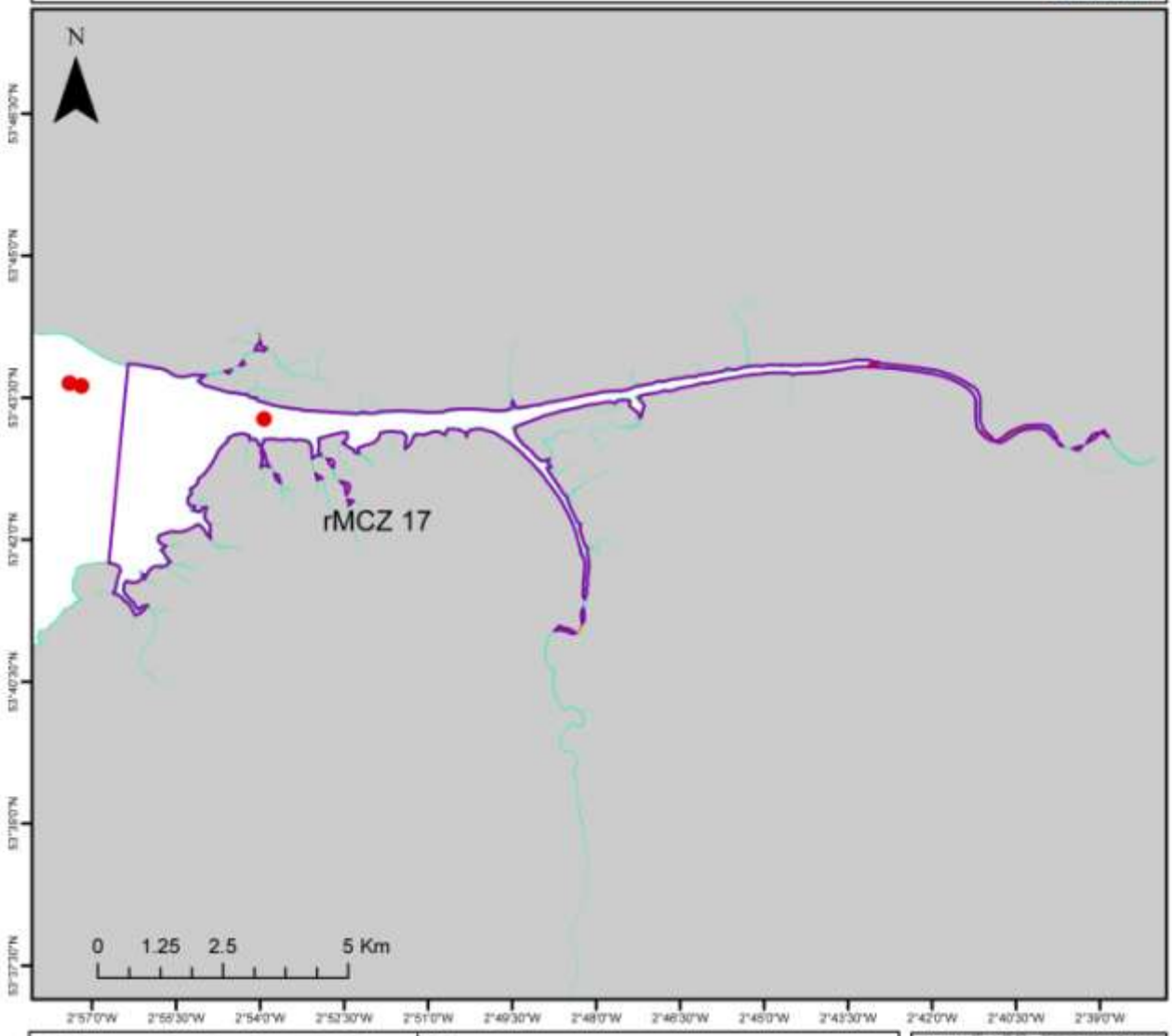
Map copyright ISCZ 2011

# rMCZ 17 – Ribble – FOCI




**This area is designated for the following FOCI:**

- **Smelt**
- **Eel**

**Area: 12.70 km²**

**Minimum dimension: 0.61 km**

**Key**

- rMCZ
- rRA
- Project Boundary

**FOCI**

- Subtidal sand gravels
- Eel
- Peat and clay exposures
- Smelt

Location of map in relation to UK

Site map displayed in Lambert azimuthal equal area projection (ETRS 1989 datum)

## 8. Site summary

The Ribble Estuary rMCZ proposes for designation two highly mobile species; Smelt (*Osmerus eperlanus*) and European eel (*Anguilla anguilla*). The estuary is already protected through the Ribble SPA, RAMSAR and SSSI. As such the habitats of saltmarsh and mudflats do not receive direct protection but, given that it is the benthic communities which provide the feeding grounds for these bird species, they deserve to be protected. The saltmarshes are of additional ecological importance as they provide the habitat for fish nurseries. Within the Ribble there is a small self-recruiting smelt (*Osmerus eperlanus*) population, which is believed to have a strong potential for recovery. There is no elver fishery in the estuary.

## 9. Detailed site description

Information presented here comes from an estuary workshop that the Environment Agency organised with an expert panel led by Dr Sarah Peet.

The Ribble Estuary contains areas of ungrazed saltmarshes which are in good condition. The area has been subject to previous dredging activity and fish production has been affected by channel modification, which highlights the importance of these protective saltmarshes as nursery areas. However, now that the Preston Dock is no longer a shipping route, dredging has ceased enabling the seabed to stabilise thus allowing for the potential recovery of fish populations and the nursery area. The Ribble provides migratory routes for several commercially important species e.g. sea trout and this highlights it's good ecological condition.

There is a small self-recruiting smelt population present in the Ribble, which is believed to have strong potential for recovery. Historically there was a substantial smelt fishery on the Ribble. The river Thames provides a strong example of the ability of smelt populations to recover when given sufficient protection. Therefore, despite only a small smelt population in the Ribble, this does not undermine the potential for recovery. In fact due to the gaps in the management measures in place for the estuary, the smelt populations have been rendered more vulnerable. The existing IFCA bylaws (focussed on salmon and lamprey) are likely to give incidental protection to smelt, however if this rMCZ was designated the IFCA bylaw five yearly review could consider smelt specific management measures.

There are no specific issues or data relating to eel in the Ribble. There is no elver fishery in the estuary which is attributed to the difficulty of fishing there due to the shape of the channel. Given the frequent distribution of eels within UK estuaries there is not a strong case for designating an MCZ based on this highly mobile species unless there is a site-specific issue of local case of interest.

Under the Water Framework Directive, for which the Ribble is a pilot catchment, this estuary is in recovery condition with respect to water quality. This is generally a good indicator of habitat quality and health. The chemical condition is good while the ecological condition is moderate.

## 10. Site boundary

The boundary for Ribble estuary rMCZ encompasses the whole of the estuary and aligns with an existing IFCA netting restriction boundary. The site was agreed to form part of the draft final recommendations and remained in place for the final network. Its boundary has not changed through time and, as such, there is no accompanying map that shows the development of the site boundary.

# 11. Conservation objectives

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Anguilla anguilla*** **(European Eel)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Anguilla anguilla*** **(European Eel)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Anguilla anguilla*** **(European Eel)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

| **Conservation Objective** | |
|---|---|
| 1<br>Maintain/ recover | Subject to natural change, **maintain** the ***Osmerus eperlanus* (Smelt)** such that: |
| 2<br>Attributes and parameters | the<br>• natural range,<br>• habitat extent,<br>• population structure,<br>• population density,<br>• size structure,<br>• natural environmental quality*, and natural environmental processes*<br><br>representative of the ***Osmerus eperlanus* (Smelt)** in the biogeographic region are all **maintained**, such that the feature makes its contribution to the network. |
| **Advice on operations** | |
| 3<br>Pressures | ***Osmerus eperlanus* (Smelt)** is sensitive to the pressures: (feature is not currently exposed to pressures in *italics*.)<br>• *Removal of non-target species (lethal)*<br>• *Shallow abrasion/penetration: damage to seabed surface and penetration ≤25mm*<br>• *Structural abrasion/penetration: Structural damage to seabed >25mm*<br>• *Siltation rate changes (high)*<br>• *Physical change (to another seabed type)*<br>• *Physical loss (to land or freshwater habitat)*<br>• *Physical removal (extraction of substratum)*<br>• *Siltation rate changes (high)*<br>• *Temperature changes - local*<br>• *Wave exposure changes – local* |
| Human activities | Human activities which cause these pressures will need to be managed if they prevent the conservation objectives from being achieved to ensure the MCZ contributes to an ecologically coherent and well-managed network of Marine Protected Areas. |

## 12. Sites to which this site is related

The proposed Ribble estuary MCZ falls within the Ribble and Alt Natura Site and includes SPA, RAMSAR and an SSSI, (note: these designations are purely focussed on the bird populations rather than benthic habitats). The Ribble rMCZ lies approximately 40km from the Wyre and Lune pMVZ. However, the Solway Firth estuary is over 140 km away.

## 13. Supporting documentation

This section should include the sources of the best available scientific and stakeholder information used to identify sites and conservation objectives presented in a table format:

| Information | Type of information | Source |
|---|---|---|
| Location of smelt | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |
| Location of Eel | Water Framework Directive Transitional and Coastal (TRAC) monitoring surveys | Environment Agency 2011 |

## 14. Stakeholder considerations

***Caveats:***

- The site was agreed subject to appropriate management measures that allow existing and future cable infrastructure, and that appropriate consideration is given to future wave/tidal devices.

***Implications:***

Stakeholder implications are explored further, on a site-by-site basis, in the management implications tables in Annex 3. The socio-economic implications of designation of this site will be costed in the Impact Assessment.

***Stakeholder support:***

Most to all stakeholders accepted the inclusion of rMCZ17 in the final network in order to satisfy the ENG targets. There was a reluctance of some industry stakeholders (marine renewables) to agree to this site until they have assurances in writing from the appropriate regulators.

For a fuller context on the RSG discussions associated with this site, readers of this report are encouraged to consult meeting reports from the ISCZ RSG workshops - especially those from the May and July 2011 workshops (ISCZ, 2011b,d).

## References

Environment Agency. 2011. *Estuary workshop paper*. Document presented to the Regional Stakeholder Group after an expert panel convened to review smelt and eel in the Irish Sea. Led by Dr Sarah Peet of the Environment Agency. ISCZ, Envirolink, Birchwood 5th April 2011.

ISCZ. 2011b. Meeting report from the 6th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.

ISCZ. 2011d. Meeting report from the 8th Irish Sea Conservation Zones Stakeholder Group meeting. RK Partnership Ltd.