DATA CONFIDENCE ASSESSMENT

Waterfoot Marine Conservation Zone (MCZ)

Subtidal Seagrass (*Zostera marina*) bed

Department of Agriculture, Environment and Rural Affairs
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Document version control			
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Summary

The Data Confidence Assessment is a document produced as part of the consultation evidence base and, similar to other documents, follows the OSPAR design principles. The assessment details our confidence in the data used to identify Areas of Search (AoS) and determine features for protection within Marine Conservation Zones (MCZs). This includes data type, age, source and coverage.

This document provides details of the Data Confidence Assessment for Waterfoot MCZ. Additional information on Waterfoot MCZ and the MCZ process includes:

- Guidance on selection and designation of Marine Conservation Zones (MCZs) in the Northern Ireland Inshore Region
- Justification report for selection of proposed Marine Conservation Zone (pMCZ) features
- Guidance on the development of Conservation Objectives and Potential Management Options
- Site Summary Document for Waterfoot Marine Conservation Zone (MCZ)
- Conservation Objectives and potential Management Options for Waterfoot Marine Conservation Zone (MCZ)
- Assessment against Selection Guidelines for Waterfoot Marine Conservation Zone (MCZ)

Glossary of Terms and Acronyms

AoS – Area of Search used to underpin the proposed Marine Conservation Zone

AFBI – Agri-food and Biosciences Institute

Biotope – The region of habitat associated with a particular ecological community

BGS – British Geological Survey

DAERA – Department of Agriculture, Environment and Rural Affairs (also referred to as the Department in the text)

DOE – Department of the Environment (now lies within DAERA)

EMODnet – The European Marine Observation and Data Network

EUNIS – European Nature Information System, is a habitat classification system used throughout Europe and covers all types of natural and artificial habitats, both aquatic and terrestrial

Infralittoral – Describes the zone from mean low water down to a depth where 1% of light can reach the seabed (JNCC)

JNCC – Joint Nature Conservation Committee, the statutory nature conservation adviser to the Department and the UK Government in the marine environment

MCZ – Marine Conservation Zone(s) designated under section 13 of the Marine Act (Northern Ireland) 2013 in the Northern Ireland inshore region and in section 116 of the Marine and Coastal Access Act 2009 in the Northern Ireland offshore region

MCZ Feature(s) – Marine Conservation Zone feature(s) that underpins the MCZ designation

MPA – As a generic term Marine Protected Areas are a clearly defined geographical space, recognised, dedicated and managed, through legal or other means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. As a specific term it refers to a national designation in Scotland (equivalent to MCZ).

NISS – Northern Ireland Sublittoral Survey

OSPAR – OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe, together with the European Union, cooperate to protect the marine environment of the North-East Atlantic

OSPAR T&D – OSPAR List of Threatened and/or Declining Species and Habitats

pMCZ – Proposed Marine Conservation Zone

pMCZ Feature – Proposed Marine Conservation Zone feature

PSA – particle size analysis

SG – Seagrass (*Zostera marina*) beds

Spyball – Underwater drop camera operated by crew aboard a vessel to study submerged habitats and species.

SS – Subtidal (sublittoral) sand

SSNI – Sublittoral Survey Northern Ireland

VMS – Vessel Monitoring System

WFD – Water Framework Directive

Introduction

MCZ name (Figure 1)	Waterfoot	Assessors	CA; CAA; JB; SB, NMcQ; LP.

Waterfoot MCZ is located on the east coast of Antrim, Northern Ireland, lies on a sheltered inlet of Red Bay, offshore from the village of Waterfoot.

Waterfoot has been designated as a MCZ for the habitat Subtidal (sublittoral) sand (SS) (EUNIS A5.533) with Subtidal seagrass (*Zostera marina*) beds (SG). *Z. marina* beds are ecologically important and are currently listed as a Priority Habitat in Northern Ireland (NI Habitat Action Plan, 2003) and in the UK (UK Biodiversity Action Plan, BAP, 2008). They are also listed on the OSPAR List of Threatened and/or Declining Species and Habitats (declining in Region II – North Sea and Region III – Celtic Sea, and threatened in Region V – Wider Atlantic) (OSPAR, 2009).

The biotope for this habitat feature is SS.SMp.SSgr.Zmar (*Zostera marina* beds on infralittoral clean sand) as *Z. marina* is the only species of subtidal seagrass found in the MCZ. The habitat occurs typically in shallow subtidal sediments in marine inlets with full salinity conditions and clear water (OSPAR, 2009; JNCC, 2015). The sediments in the Waterfoot embayment are characterised by a high proportion of fine sands with some gravel that support the SG ecosystem.

Recent surveys indicate the MCZ contains a large SG bed made up of several smaller SG meadows that appear in good condition and are seed bearing[3&4]. Seagrass beds are highly variable in extent; in the MCZ the cover of SG is patchy with the density varying annually. In most of the meadows the density is medium to high[4&5] with abundances ranging from frequent (10-19%) to abundant (40- 79%) on the SACFOR scale (JNCC, 2014). The SG habitat in Waterfoot MCZ is currently the best known example in Northern Ireland.

This MCZ was proposed by Seasearch NI to the Department (Seasearch recommendation, 2014). The boundary of the MCZ was drawn to encompass the full extent of the SG bed and to represent the range in diversity of the habitat within the area. The seaward boundary line was drawn following the edge of SG records (present up to 6.5-7m depth), while a suitable buffer from the coastline was incorporated in the landward boundary lines to minimise the effects from industry and tourism on the SG without impacting the conservation objectives.

Following the pMCZ public consultation the Department carried out a new survey of the area (2016). This survey confirmed the absence of SG within the bottom right corner of the proposed boundary. The boundary was therefore amended to exclude this corner, enabling certain activities to continue, as suggested by stakeholders. This survey also found an extension of the SG bed to the north-west. As a result the proposed boundary was further amended to include this extension to maintain the integrity of the bed as a whole. The new MCZ area is 0.811km^2 (previously this was 0.788km^2).

<table>
<tr><th colspan="5">Protected features (Figure 2)</th></tr>
<tr><td>Biodiversity</td><td colspan="2">Subtidal (sublittoral) sand (SS):
Seagrass beds (SG) (component habitat)</td><td>Geodiversity</td><td>n/a</td></tr>
<tr><th colspan="5">Data used in assessment</th></tr>
<tr><td>Version of Marine recorder database</td><td>Update Nov2014</td><td>Other datasets used (specify)</td><td colspan="2">[1]Northern Ireland Sublittoral Survey (NISS) East Coast 1982-1985 (Marine Recorder database)
[2]Sublittoral Survey of Northern Ireland (SSNI) East Antrim 2006 (Marine Recorder database)
[3]Seasearch Red Bay survey 2008, 2009, 2012 (Marine Recorder database)
[4]DOE Waterfoot pMCZ spyball survey 2015 - drop-camera underwater video/still images, infaunal grabs samples and particle size analysis (PSA)
[5]DOE Waterfoot pMCZ diving survey 2015 – diving transects, photographs and infaunal samples
[6]JNCC EU SeaMap - A broad-scale physical habitat map for European Seas 2014 v8.3
[7] AFBI-DARD-QUB Northern Ireland Nearshore Subtidal Habitat mapping project 2004.
[8]DOE side-scan survey, 2015
[9]DAERA Waterfoot pMCZ spyball survey 2016 - drop-camera underwater video/still images</td></tr>
</table>

<table>
<tr><th colspan="8">Summary of Data Confidence Assessment</th></tr>
<tr><td colspan="2">Confident in underpinning data</td><td>Yes</td><td>✓</td><td>Partial</td><td></td><td>No</td><td></td></tr>
<tr><td colspan="2" rowspan="2">Confident in presence of identified features?</td><td rowspan="2">✓</td><td rowspan="2">Data suitable to define extent of individual protected features</td><td>✓</td><td>Partial</td><td>✖</td></tr>
<tr><td>SS:SG</td><td></td><td></td></tr>
<tr><td>Summary</td><td colspan="7">The Department has high confidence in the presence of SG and the supporting evidence in the MCZ.

Most records for SG in the AoS were collected during diving surveys including conservation surveys and volunteer dives. Records from NISS[1] (1982-1985) and SSNI[2] (2006) were gathered by the Department and National Museums Northern Ireland. Additional diving records were provided by Seasearch Northern Ireland from surveys carried out during 2008, 2009 and 2012[3].

The two surveys undertaken in 2015 by the Department using an underwater drop-camera[4] and diving transects[5] confirmed the presence of SG while densities and relative coverage were estimated from the footage and photographs of the meadows. Abundances ranged from frequent (10-19%) to abundant (40- 79%) on the SACFOR scale (JNCC, 2014). Particle size analysis (PSA)[4] on grab samples obtained during the surveys identified the broad scale habitat as SS. This confirmation of sediment types underpin the predictive habitat mapping projects used in the assessment (EU SeaMap habitat maps[6] and AFBI-DARD-QUB Northern Ireland Nearshore Subtidal Habitat mapping project 2004[7]). This, combined with the depth limitation (6.5-7m) of SG distribution in the area supported the seaward boundary extent.

Although side-scan sonar was used to survey the AoS it was difficult to differentiate between SG and other macrophyte species[8]. This became apparent when reviewing video footage as patches of SG were either interspersed with other macrophytes or that the density of epiphytes on the SG fronds was high.

Following the public consultation the Department re-surveyed the pMCZ in 2016 using the spyball camera, and gathered additional data on the extent and coverage of the bed[9]. SG was not present in the south-east corner of the pMCZ while an extension of the bed was recorded to the north (outside the initial pMCZ boundary).

The above data, combined with information on the uses and activities in the AoS, enabled the boundary of the MCZ to be defined with high confidence.</td></tr>
</table>

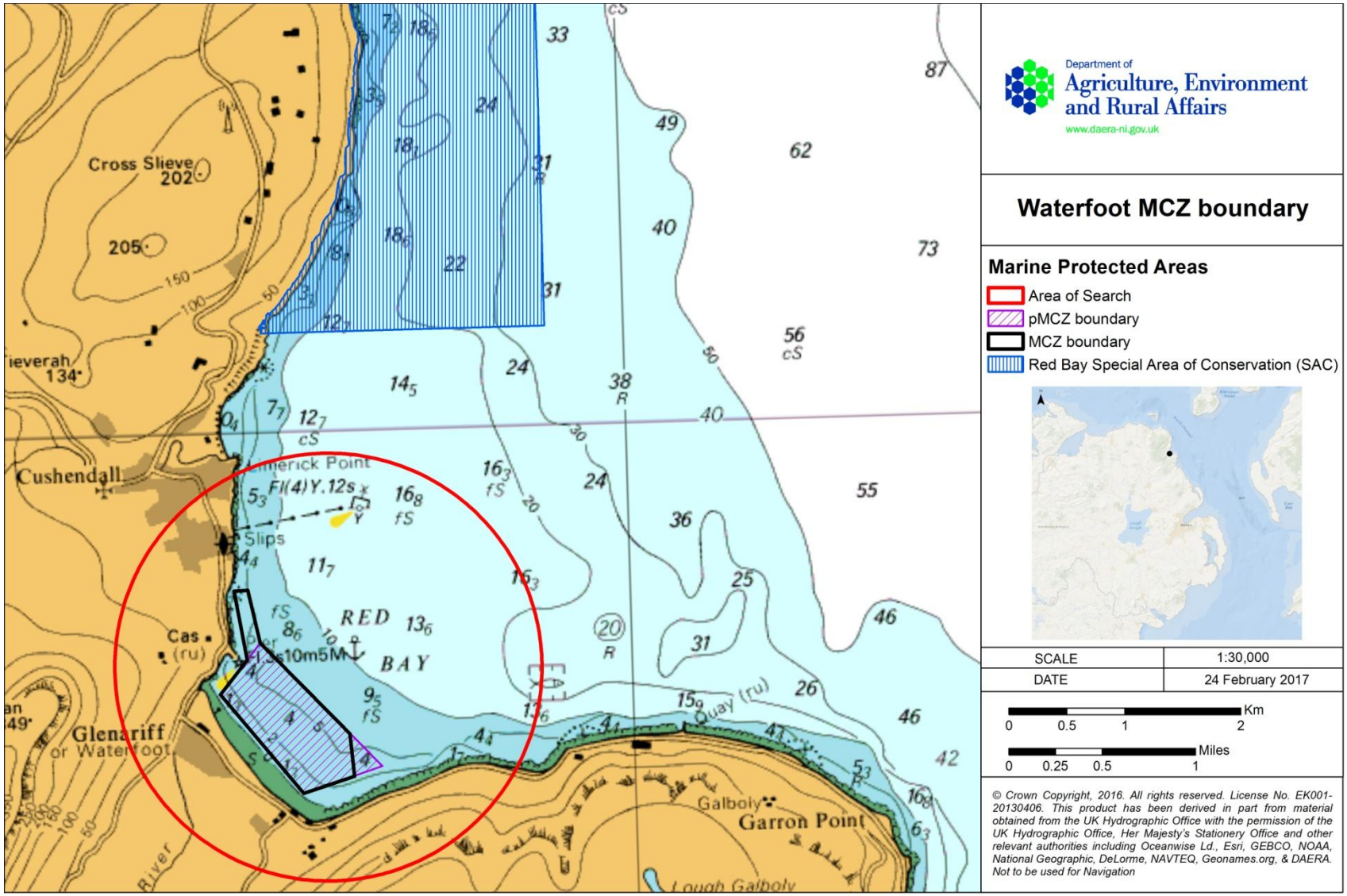

Figure 1 Location of Area of Search (AoS), initial proposed boundary (pMCZ) and designated boundary of Waterfoot MCZ

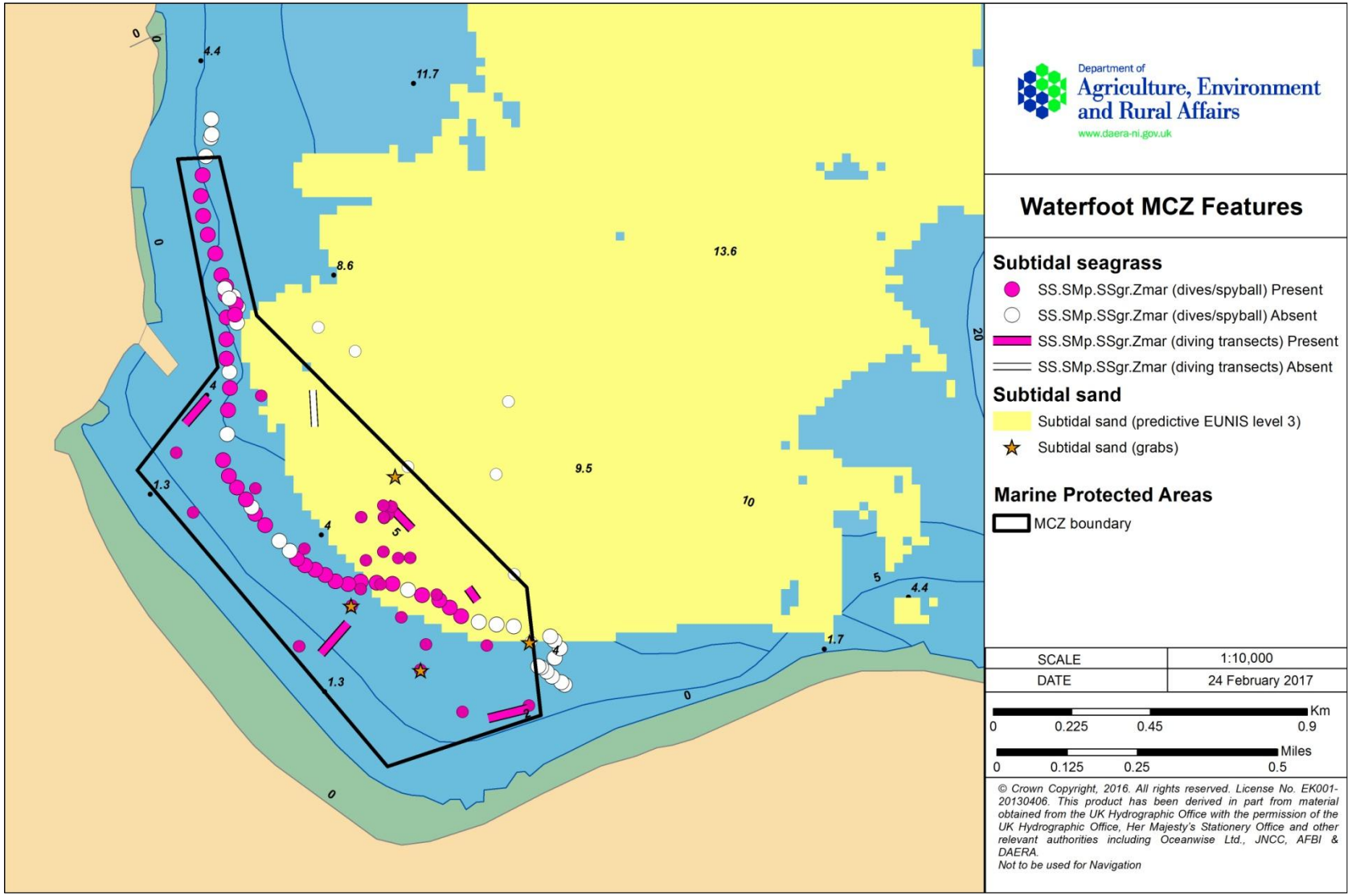

Figure 2 Distribution of the designated feature in Waterfoot MCZ

Data Confidence Assessment

The Department's assessment of data confidence is based on a consideration of the age and source of the data, the type of sampling methodologies used and the coverage across the entire MCZ.

Age of data (Figure 3)

Multiple records collected within last 10 years	SS:SG	**Multiple records collected 10-25 years ago**	SS:SG	**Multiple records >25 years old**	

Comments	Some of the oldest records were from NISS[1], collected in 1982. However, the majority of data for the SG bed habitat were recorded within the last 10 years. Data for SG beds were obtained from the SSNI in East Antrim in 2006[2]. Additional data were collected by Seasearch NI divers in several surveys during 2008, 2009 and 2012[3]. Recent data on SG were recorded in videos during the pMCZ spyball survey in 2015[4]. A diving survey for SG was also carried out by the Department in 2015[5]. Side-scan sonar (2015)[8] was employed to survey the area but difficulty in differentiating between SG and other macrophyte species reduce confidence in this method of assessment. The area was surveyed once more with the spyball in 2016[9] following the public consultation. Information on SS in the AoS was derived from predictive habitat maps (JNCCv8.3 2014[6], EUNIS version 2007-2011) and ground-truthing data (AFBI-DARD-QUB Northern Ireland Nearshore Subtidal Habitat mapping project 2004[7]). PSA data confirming SS in the MCZ was acquired from sediment grab samples collected in 2015[4].

Source of data (Figure 4)

Targeted data collection for nature conservation purposes	✓	**Statutory monitoring (marine licensing etc.)**		**Fisheries survey work**	
Data collection associated with development proposals (EIA etc.)		**Recreational / volunteer data collection**	✓	**Other** (specify) – EUNIS predictive maps, PSA data	✓

Comments	The majority of the MCZ feature records have been collected through targeted nature conservation surveys

	(NISS East Coast 1982[1], SSNI East Antrim 2006[2], DOE Waterfoot pMCZ spyball survey work 2015[4], DOE Waterfoot pMCZ diving survey 2015[5] and DAERA Waterfoot pMCZ spyball survey 2016[9]). The Seasearch NI volunteer project[3] used trained surveyors to collect SG data during several surveys in the area (2008, 2009 and 2012). Additional data were derived from grab samples and infaunal samples collected by the Department during the DOE Waterfoot pMCZ surveys[4&5]. The EU SeaMap predictive habitat map used in this assessment was developed by JNCC and The European Marine Observation and Data Network (EMODnet, 2014)[6]. The East Antrim coast seabed habitat map data used had been produced for nature conservation purposes as part of the Northern Ireland Nearshore Subtidal Habitat Mapping project[7].

Sampling methods / resolution

Feature	Modelled	Acoustic / remote sensing	Remote video / camera	Infaunal - grab / core	Sediment sampling	Diving	Fisheries sampling
SS:SG	✓	✓	✓	✓	✓	✓	

Comments	A number of sampling methods have been used to collect information on the SG feature in the MCZ. The predictive seabed habitat mapping project EU SeaMap2014 was developed by JNCC and The EMODnet (EMODnet, 2014)[6]; this provides a modelled broad scale SS habitat in the AoS (based on validation samples). The AFBI-DARD-QUB seabed habitat map[7] was produced from ground-truthing data through the development of acoustic signatures and extrapolation of data provided by NISS[1].Side-scan sonar was tested but proved unreliable to differentiate between SG and other macrophyte species[8]. The shallow nature of the site along with clear water lends itself to comprehensive monitoring using visual techniques such as drop camera (spyball) and/or diving. Remote video and photographic imagery sampling (using the spyball camera, undertaken by the Department across the MCZ), provided an overview of the coverage and distribution of the SG beds in the area[4&9]. NISS 1982[1], SSNI 2006[2], Seasearch NI surveys 2008-2012[3]and DOEWaterfoot pMCZ diving survey[5] were all conservation based

	diving surveys within the AoS that provided photographic and video evidence of the *Z. marina* biotope and the presence of key species. Infaunal grab sampling was targeted as part of the DOE Waterfoot pMCZ surveys[4&5]. These grab samples were also used to provide the PSA data classifying the sediment as SS.

Data coverage (Figures 3 to 6)							
Across the MCZ							
Large numbers of feature records distributed across the MCZ		**Numerous feature records scattered across the MCZ with some clumping**		**Numerous feature records possibly with some clumping. Boundary not defined solely by recorded feature distribution**	✓	**Few or isolated feature records - possibly clumped**	
For Individual features							
Multiple records of individual features providing indication of extent and distribution throughout the MCZ?	✓ SS:SG	**Few or scattered records of specific features making extent and broad distribution assessment difficult?**		**Few or isolated records of specific feature records**			
Are acoustic remote sensing data available to facilitate the development of a full coverage predictive seabed habitat map?	Side-scan sonar[7] data was available for the MCZ; however, review of the spyball video footage indicated that areas described as containing dense SG by the side-scan were actually caused by other species of algae growing on the SG fronds. In this case using the side-scan alone may lead to an overestimation of SG abundance.						
Comments	**Subtidal (sublittoral) sediments (SS): Seagrass (*Zostera marina*) beds (Figures 5 and 6)** • 2014 JNCC EU SeaMap predictive habitat map[6] – This predicts that SS (A5.2) occurs in the outer part of the embayment within the AoS while subtidal mixed sediments (A5.4) and subtidal coarse sediments (A5.1) occur in the inner part of the bay and inside the pMCZ. • 2004 AFBI-DARD-QUB Northern Ireland Nearshore Subtidal Habitat mapping project (habitat map of East						

	Antrim)[7] – This project predicted SS occurring inside the MCZ boundary whereas the EU SeaMap did not accurately reflect the actual habitats present in this site. This has been corrected in the maps by combining both models. • 2014 Marine Recorder[1,2&3] – There are four records of SG in the Marine Recorder database recorded as part of the East Coast NISS and the East Antrim SSNI. *Z. marin*a beds (SS.SMp.SSgr.Zmar) on SS were recorded in diving surveys in June 1982 and June 2006. The points sampled in the inner part of the MCZ, close to Waterfoot Beach, were recorded as small patches of SG every 10m. There are also multiple records for the presence of SG from Seasearch NI[3] during June 2009, August 2009 and July 2012. Abundances were recorded in Marine Recorder as occasional (5-9%) and common (20-39%); while a general description of the site identified a patchy coverage with an average shoot density of 149/m^2 (9.3/quadrat) (Seasearch recommendation, 2014). Other species were also identified throughout the bed and all surveys verified that SG was seed-bearing. • 2015 DOE Waterfoot pMCZ spyball survey[4] – 17 points within the MCZ were filmed with a drop-camera remotely controlled from RV Capitella on July 2015. The video footage was viewed using freeze-frame; slow motion and standard play speed as necessary to enable the identification of as many conspicuous species as possible and a determination of broad substrate type. The video showed clear presence of SG in 11 of the stations sampled in the pMCZ with abundances between frequent (10-19%) and abundant (40- 79%) on the SACFOR scale (JNCC, 2014) (refer to Figure 5). The SG bed showed a limited extent which was correlated to a depth of 5-7m (where the availability of light for photosynthesis is restricted). Overall, the meadows are patchy in distribution but they are large in area forming the main SG bed. Four sediment samples were collected from different stations by the Department in the pMCZ. PSA was carried out for sediment characterisation and classed according to EUNIS/British Geological Survey (BGS) modified Folk class provided. The results of the PSA identified all sediment samples as 'slightly gravelly sand' (EUNIS 5.3). • 2015 DOE Waterfoot pMCZ diving survey[5] – DOE divers carried out 100m dive transects in August 2015. Six transects were sampled using a 25x25cm quadrat and photographs were taken of each quadrat. From this we calculated an average density ranging from 49 to 110

	shoots/m^2 in the area sampled and an abundance rating of frequent (9-17%) on the SACFOR scale (JNCC, 2014). Five of the six transects sampled had SG meadows. In general, the coverage was patchy. • 2016 DAERA Waterfoot pMCZ spyball survey [9] – the seabed was filmed with the spyball camera attached to a sledge from the RV Trivia on September 2016. The spyball camera was towed along the boundary of the pMCZ from south-east to north-west. Initial analysis showed patchy coverage of the bed, further supporting earlier surveys. The video footage was analysed using freeze-frame; slow motion and standard play speed as necessary to enable the identification of as many conspicuous species as possible and a determination of broad substrate type. 34 points of a total of 63 points evidenced the presence of SG. The video also showed that SG was absent within the bottom right corner of the pMCZ boundary. The presence of SG on a new area was discovered to the North of the pMCZ and therefore the boundary was amended to include the whole distribution of the bed.

The Evidence Base (Figures)

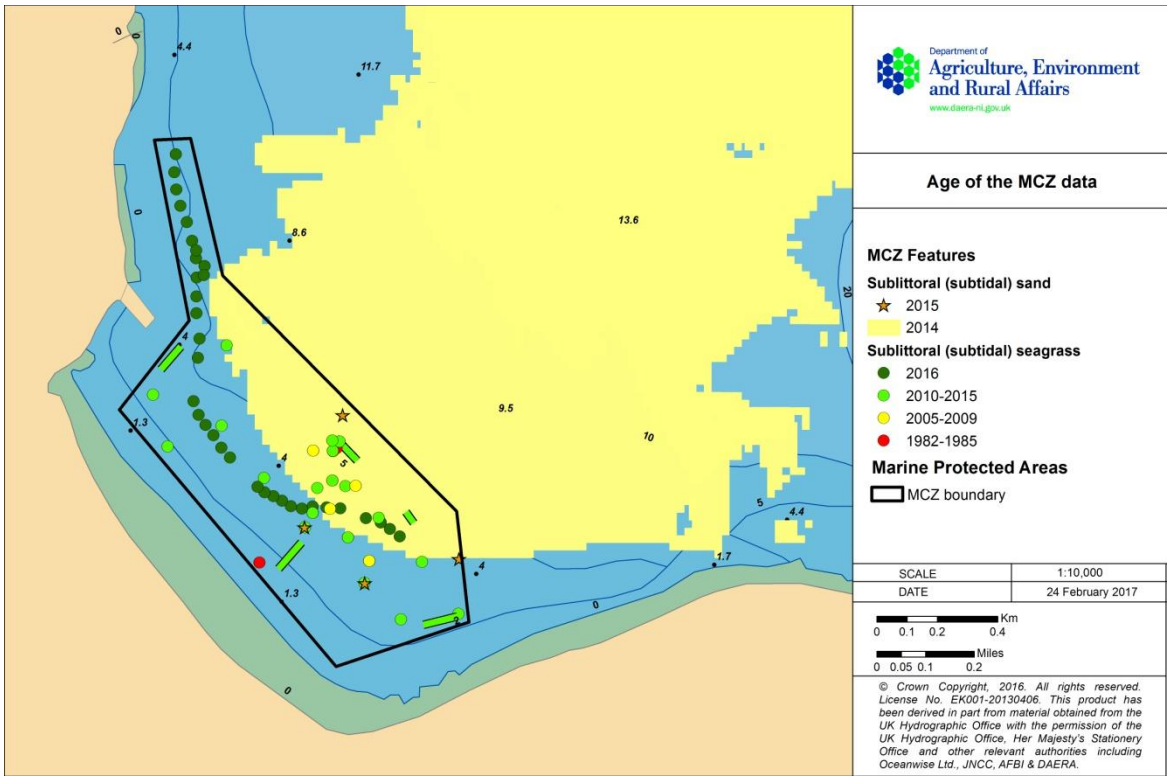

Figure 3 Age of the feature data collected in Waterfoot MCZ

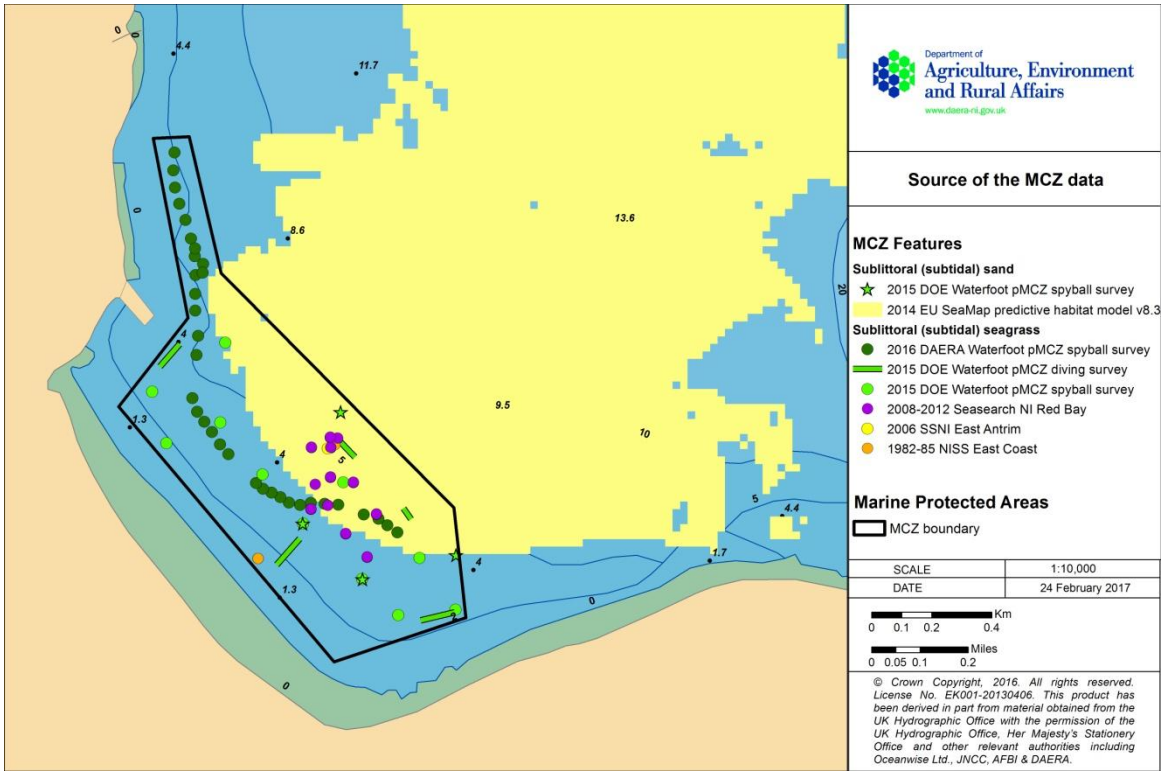

Figure 4 Source of the feature data collected in Waterfoot MCZ

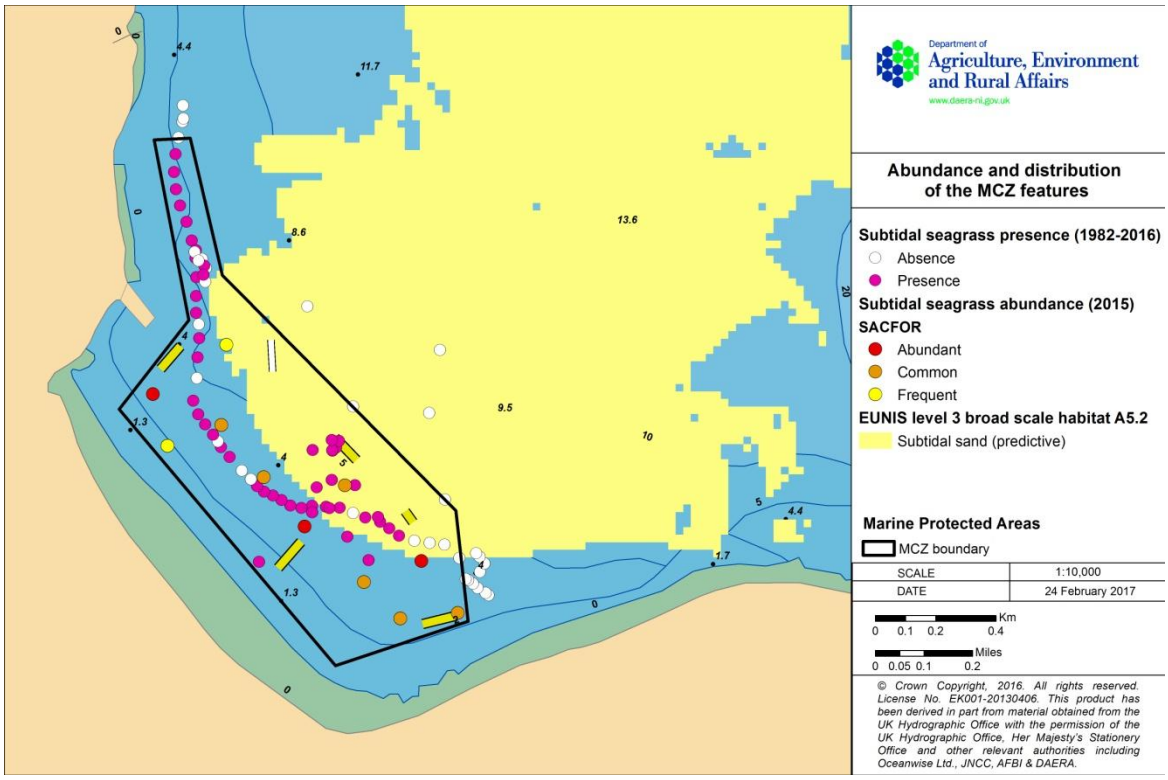

Figure 5 Abundance and distribution of feature data collected in Waterfoot MCZ

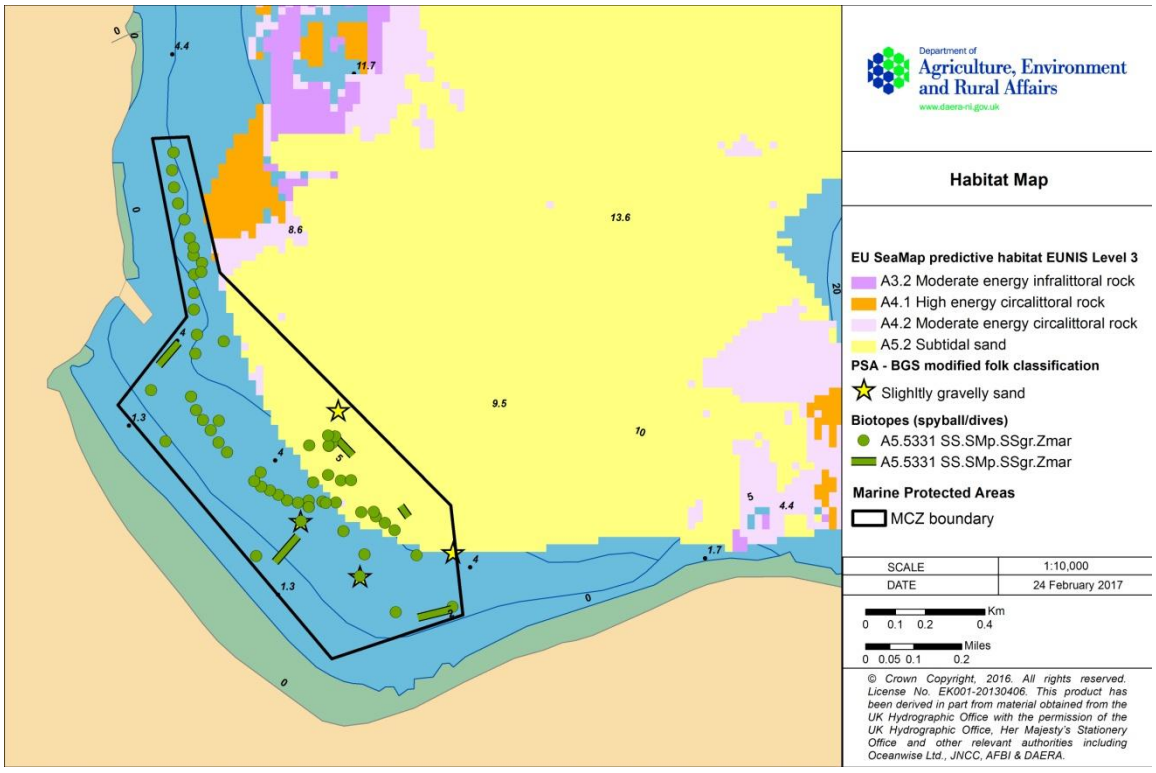

Figure 6 Habitat map of Waterfoot MCZ and surrounding seabed. The biotope SS.SMp.SSgr.Zmar (EUNIS code A5.5331) is *Zostera marina* beds on lower shore or infralittoral clean sand

Data sources and Bibliography		
Data source (used in assessment)	**Reference**	**Features covered**
[1]Northern Ireland Sublittoral Survey (NISS) East Coast 1982-1985 (Marine Recorder database)	Erwin, D.G., Picton, B.E., Connor, D.W., Hawson, C.M., Gilleece, P. and Bogues, M.J. 1986. The Northern Ireland Sublittoral Survey. Ulster Museum, Belfast.	SG
[2]Sublittoral Survey of Northern Ireland (SSNI) East Antrim 2006 (Marine Recorder database)	Goodwin, C., Picton, B., Breen, J., Edwards, H. and Nunn, J. 2011. Sublittoral Survey Northern Ireland (2006 – 2008). Northern Ireland Environment Agency Research and Development Series No. 11/01. https://www.daera-ni.gov.uk/publications/sublittoral-survey-northern-ireland-2006-2012	SG
[3]Seasearch Red Bay survey 2008, 2009 and 2012 (Marine Recorder database)	Seasearch Northern Ireland. Northern Ireland Summary Survey Report. 2008. http://www.seasearch.org.uk/downloads/N%20Ireland%202008%20summary.pdf	SG
	Seasearch Northern Ireland. Northern Ireland Summary Survey Report. 2009. http://www.seasearch.org.uk/downloads/NIreland%202009	
	Seasearch Northern Ireland. 2012. Northern Ireland Summary Survey Report. http://www.seasearch.org.uk/downloads/SeasearchNI% 20Report2012.pdf	
[4]DOE Waterfoot pMCZ spyball survey 2015 - drop-camera underwater video/ still images, infaunal grabs samples and particle size analysis (PSA)	No survey report produced	SS SG

[5]DOE Waterfoot pMCZ diving survey 2015 - diving transects, photographs and infaunal samples	No survey report produced	SG SS
[6]JNCC EU SeaMap – A broad-scale physical habitat map for European Seas 2014 v8.3/	EU SeaMap. A broadscale physical habitat map for European Seas. 2014c. EMODnet. EUSeaMap: A broad-scale physical habitat map for European Seas.	SS
[7]AFBI-DARD-QUB Northern Ireland Nearshore Subtidal Habitat mapping project 2004	Mitchell, A.J. and Service, M. 2004. Northern Ireland Nearshore Subtidal Habitat Mapping Project: QUB / DARD Report to EHS.	SS
[8]DOE side-scan survey, 2015	No survey report produced	SG SS
[9]DAERA Waterfoot pMCZ spyball survey 2016 - drop-camera underwater video/still images	No survey report produced	SG SS
N/A	JNCC. 2014. SACFOR scale. http://jncc.defra.gov.uk/page-2684	SG
N/A	JNCC. 2015. The Marine Habitat Classification for Britain and Ireland Version 15.03 [Online]. [Date accessed]. Available from: http://jncc.defra.gov.uk/MarineHabitatClassification/	SG
N/A	OSPAR Commission. 2009. Background Document for *Zostera* beds, Seagrass beds. http://qsr2010.ospar.org/media/assessments/Species/P00426_Zostera_beds.pdf	SG
N/A	Seasearch recommendation. 2014. http://www.seasearch.org.uk/downloads/Red%20Bay%20Seagrass%20Proposal.pdf	SG

N/A	UK Biodiversity Action Plan; Priority Habitat Descriptions. 2008. BRIG (ed. Ant Maddock). Seagrass beds. http://jncc.defra.gov.uk/pdf/UKBAP_BAPHabitats-49- SeagrassBeds.pdf	SG

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Photos represent Priority Marine Features found throughout the Northern Ireland Inshore Region

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