

DATA CONFIDENCE ASSESSMENT

Waterfoot Proposed Marine Conservation Zone (pMCZ)

Subtidal seagrass (*Zostera marina*) beds



Document version control			
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Version 0.2	21/10/2015	Joe Breen, Clara Alvarez Alonso, Liz Pothanikat, Stephanie Bennett and Nuala McQuaid	Amendments
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Contents

Executive Summary3

Glossary of Terms and Acronyms4

Data Confidence Assessment9

 Age of data (Figure 3).....9

 Source of data (Figure 4).....9

 Sampling methods / resolution 10

 Data coverage (Figures 3 to 6)..... 10

The Evidence Base (Figures) 13

Data sources and Bibliography 15

Executive 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 proposed for protection within proposed Marine Conservation Zones (pMCZ). This includes data type, age, source and coverage.

This document provides details of the Data Confidence Assessment for Waterfoot pMCZ.

Additional information on Waterfoot pMCZ and proposed features 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 proposed Marine Conservation Zone (pMCZ)
- Conservation Objectives and potential Management Options for Waterfoot proposed Marine Conservation Zone (pMCZ)
- Assessment against Selection Guidelines for Waterfoot proposed Marine Conservation Zone (pMCZ)
- Data Confidence Assessment for Waterfoot proposed Marine Conservation Zone (pMCZ)

Glossary of Terms and Acronyms

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

AFBI – Agri-food and Biosciences Institute

BGS – British Geological Survey

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

JNCC – Joint Nature Conservation Committee

MCZ - Marine Conservation Zone used to refer to MCZs 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 adjacent to Northern Ireland

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 features that will underpin the MCZ designation

PSA - Particle Size Analysis

SG – Seagrass (*Zostera marina*) beds

SS – Subtidal (sublittoral) sand

SSNI – Sublittoral Survey Northern Ireland

Proposed MCZ name	Waterfoot	Assessors	CA; CAA; JB; LP; NMcQ; SB
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Waterfoot pMCZ (Figure 1) 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 proposed as a potential 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 by the UK Biodiversity Action Plan (UK 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 pMCZ. 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 indicated the pMCZ 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 pMCZ the cover of SG is patchy with the density varying between years. 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 pMCZ is currently the best known example in Northern Ireland.

This pMCZ was proposed by Seasearch NI to the Department ([Seasearch recommendation, 2014](#)). The boundary of the pMCZ 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 northern boundary line was drawn following the edge of SG records (present up to 5-7m depth), while a suitable buffer from the coastline was incorporated in the remaining three boundary lines to minimise the effects from industry and tourism on the SG without impacting the conservation objectives.

Protected features (see Figure 2)			
Biodiversity	<ul style="list-style-type: none"> • <i>Subtidal (sublittoral) sand (SS):</i> - <i>Seagrass beds (SG) (component habitat)</i> 	Geodiversity	<i>n/a</i>

Data used in assessment			
Version of Marine recorder database	<i>Update Nov2014</i>	Other datasets used (specify)	<ul style="list-style-type: none"> - ¹Northern Ireland Sublittoral Survey (NISS) East Coast 1982-1985 (Marine Recorder database) - ²Sublittoral Survey of Northern Ireland (SSNI) East Antrim 2006 (Marine Recorder database) - ³Seasearch Red Bay survey 2008, 2009, 2012 - video tows (Marine Recorder database) - ⁴DOE Waterfoot pMCZ spyball survey 2015 - drop-camera underwater video/still images, infaunal grabs samples and Particle Size Analysis (PSA) - ⁵DOE Waterfoot pMCZ diving survey 2015 – diving transects, photographs and infaunal samples - ⁶JNCC EU SeaMap: A broad-scale physical habitat map for European Seas 2014 v8.3/AFBI-DOE-QUB) Near shore habitat map - ⁷DOE side-scan survey, 2015

Summary of Data Confidence Assessment						
Confident in underpinning data		Yes	✓	Partial		No
Confident in presence of identified features?	✓	Data suitable to define extent of individual protected features	✓	Partial	✘	
			SS:SG			
Summary	<p>The Department has high confidence in the presence of the proposed feature and the supporting evidence in the pMCZ.</p> <p>Most records for SG in the AoS were collected during diving surveys including conservation surveys and volunteer dives. Records from NISS¹ (1982-1985) and SSNI² (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 to 2012³.</p> <p>The two surveys undertaken in 2015 by the Department using an underwater drop-camera⁴ and diving transects⁵ 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) 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 (AFBI-DOE-QUB Habitat Seemap and EU SeaMap habitat maps⁶). This, combined with the depth limitation (6.5-7m) of SG distribution in the area supported the seaward boundary extent.</p> <p>The above data combined with information on the uses and activities in the AoS have enabled us to define the boundary of the pMCZ with high confidence.</p>					

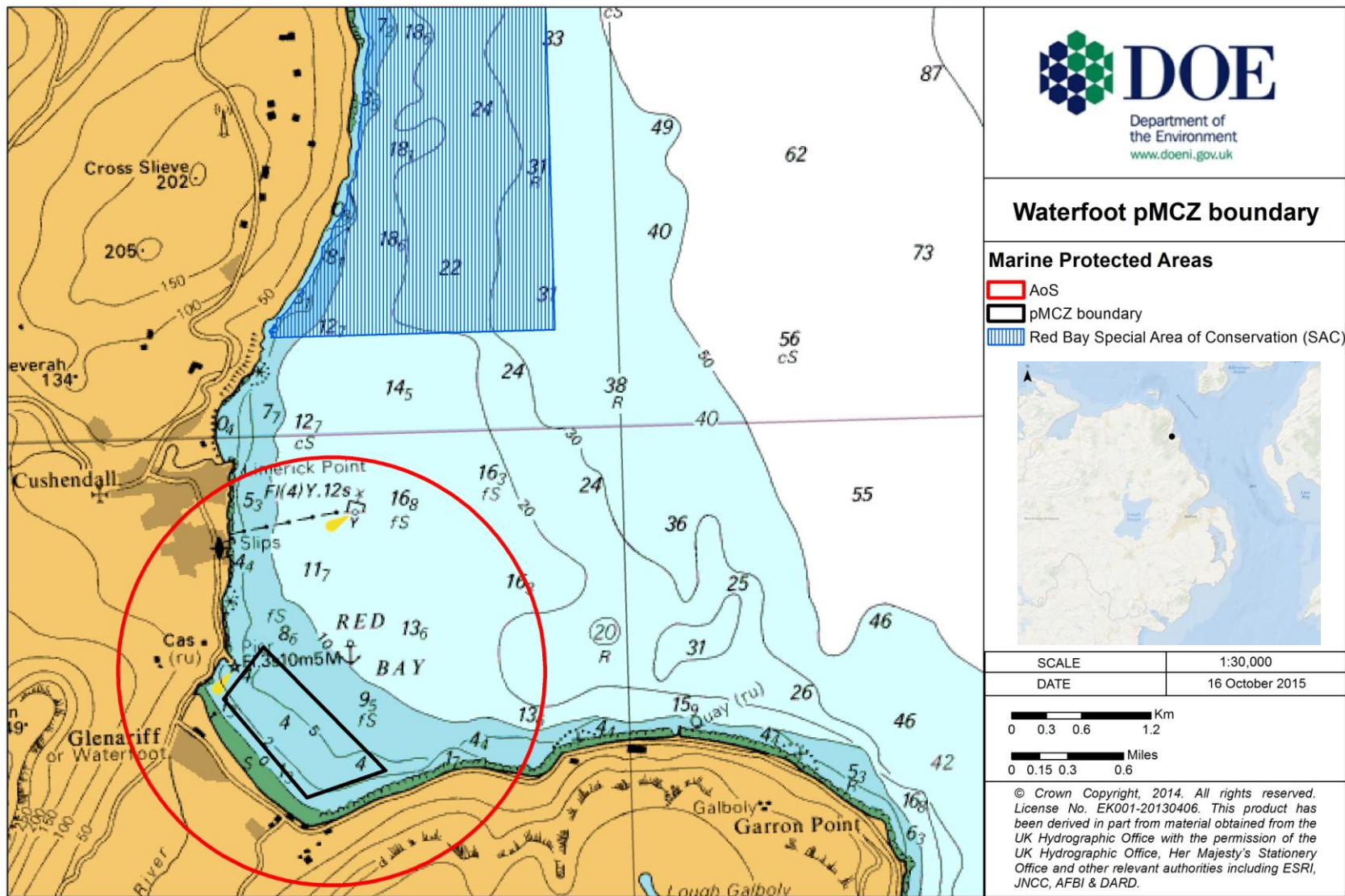


Figure 1 Location of Area of Search and the proposed boundary of Waterfoot pMCZ

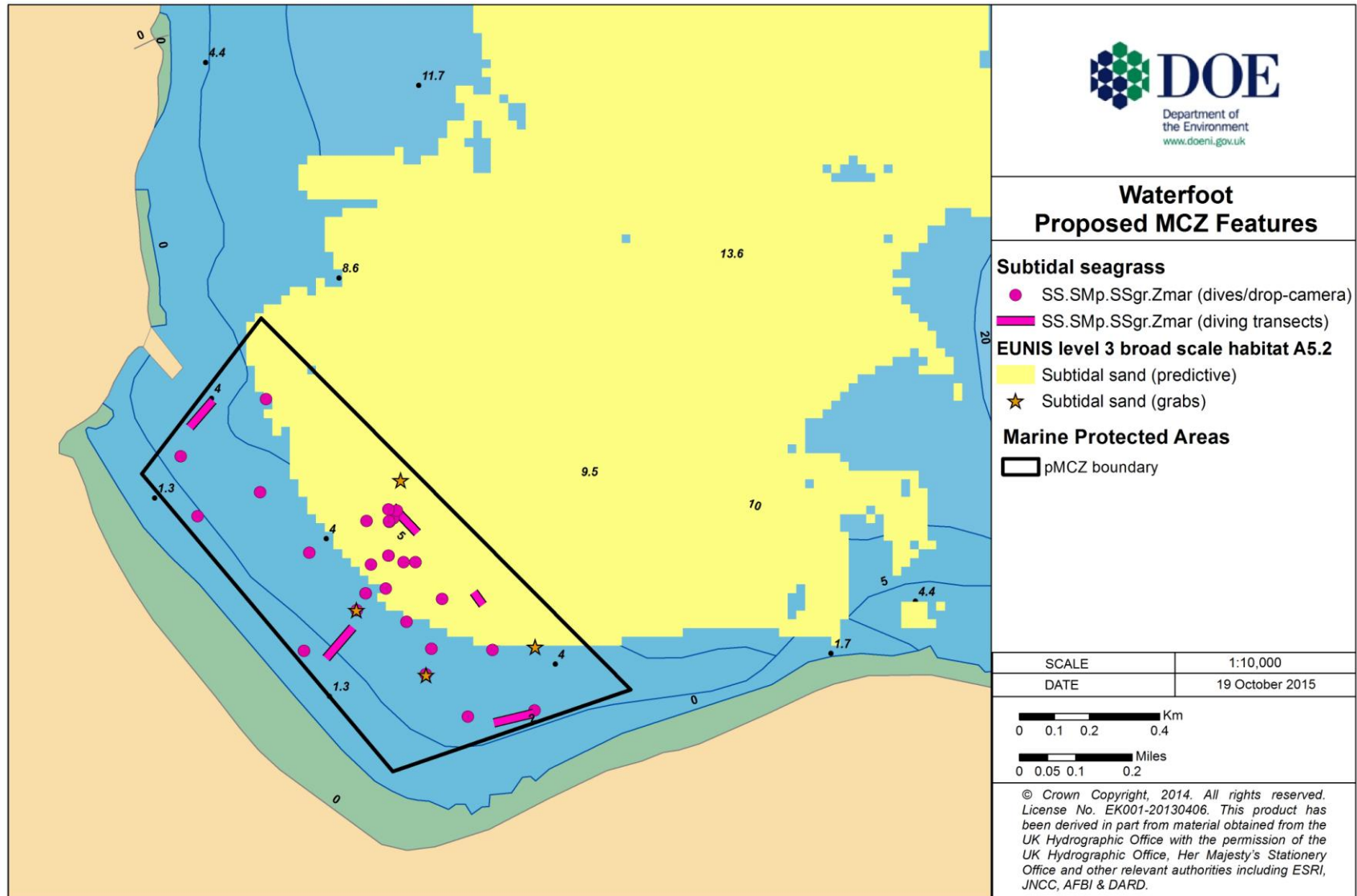


Figure 2 Distribution of the pMCZ features in Waterfoot

Data Confidence Assessment

The Department 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 pMCZ.

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	<p>Some of the oldest records from NISS¹ were collected in 1982. However, the majority of data for the habitat SG beds was recorded within the last 10 years. Data for SG beds was obtained from the SSNI in East Antrim in 2006². Additional data was collected by Seasearch divers in several surveys during 2008, 2009 and 2012³.</p> <p>Recent data on SG were recorded in videos during the pMCZ spyball survey in 2015⁴. A diving survey for SG was carried out by the Department in 2015⁵.</p> <p>Information on SS in the AoS was derived from predictive habitat maps (JNCCv8.3 2014⁶, EUNIS version 2007-2011). PSA data confirming SS in the pMCZ was acquired from sediment grab samples collected in 2015⁴.</p>				

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	<p>The majority of the proposed feature records have been collected through targeted nature conservation surveys (NISS East Coast 1982¹, SSNI East Antrim 2006², DOE Waterfoot pMCZ spyball survey work 2015⁴ and DOE Waterfoot pMCZ diving survey 2015⁵).</p> <p>The Seasearch Northern Ireland volunteer project³ used trained surveyors to collect SG data during several surveys in the area (Seasearch, 2008, Seasearch, 2009 and Seasearch, 2012).</p> <p>Additional data was derived from grab samples and infaunal samples collected by the Department during the DOE Waterfoot pMCZ surveys^{4&5}.</p> <p>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.</p>				

Sampling methods / resolution								
Feature	Modelled	Acoustic / remote sensing	Remote video / camera	Diving	Infaunal - grab / core	Sediment sampling		Fisheries sampling
SS:SG	✓	✓	✓	✓	✓	✓		
Comments	<p>A number of sampling methods have been used to collect information on the feature of interest in the pMCZ.</p> <p>The predictive seabed habitat mapping project EU SeaMap2014 was developed by JNCC and The EMODnet⁶ (EMODnet, 2014)⁶; this provides a modelled broad scale SS habitat in the AoS (based on validation samples).</p> <p>Side-scan sonar was tested but proved unreliable to differentiate between SG and other macrophyte species⁷.</p> <p>The shallow nature of the site along with clear water lends itself to comprehensive monitoring using visual techniques such as drop camera and/or diving.</p> <p>Remote video and photographic imagery sampling (using a drop-down spyball camera), undertaken by the Department across the pMCZ), provided an overview of the coverage and distribution of the SG beds in the area⁴.</p> <p>NISS 1982¹, SSNI 2006², Seasearch surveys 2008-2012³ and DOE Waterfoot pMCZ diving survey⁵ were all conservation based diving surveys in the AoS that provided photographic and video evidence of the Z. marina biotope and the presence of key species.</p> <p>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 identifying SS.</p>							

Data coverage (Figures 3 to 6)							
<i>Across the pMCZ</i>							
Large numbers of proposed feature records distributed across pMCZ		Numerous proposed feature records scattered across the pMCZ with some clumping		Numerous proposed 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 pMCZ?	✓ 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 is available for the pMCZ; however, review of the spyball video footage indicates that areas described as containing dense SG by the side-scan are 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	<p>Subtidal (sublittoral) sediments (SS): Seagrass beds (Figures 5 and 6)</p> <ul style="list-style-type: none"> 2014 JNCC EU SeaMap predictive habitat map⁶ – 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. AFBI-DOE-QUB habitat map of East Antrim predicts SS occurring inside the pMCZ boundary while the EU SeaMap does not reflect the actual habitats 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. <i>Z. marina</i> beds (SS.SMp.SSgr.Zmar) on SS were recorded in these diving surveys in June 1982 and June 2006. The points sampled in the inner part of the pMCZ, close to Waterfoot Beach, were recorded as small patches of SG every 10m. There are also multiple records for the presence of SG from Seasearch³ during June 2009, August 2009 and July 2012. Abundances were recorded in Marine Recorder as occasional (5-9%) and common (20-39%; a general description of the site identified a patchy coverage with an average shoot density of 149/m² (9.3/quadrat) (Seasearch recommendation, 2014). Other species were also identified throughout the bed and verified that SG was seed-bearing in all the surveys. 2015 DOE Waterfoot pMCZ spyball survey⁴ – 17 points within the pMCZ 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 survey⁵ – 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 have calculated an average density ranging from 49 to 110 shoots/m² in area sampled and an abundance of frequent (9-17%) on the [SACFOR scale](#) (JNCC, 2014). Five of the six transects sampled had SG beds. In general the coverage was patchy.

The Evidence Base (Figures)

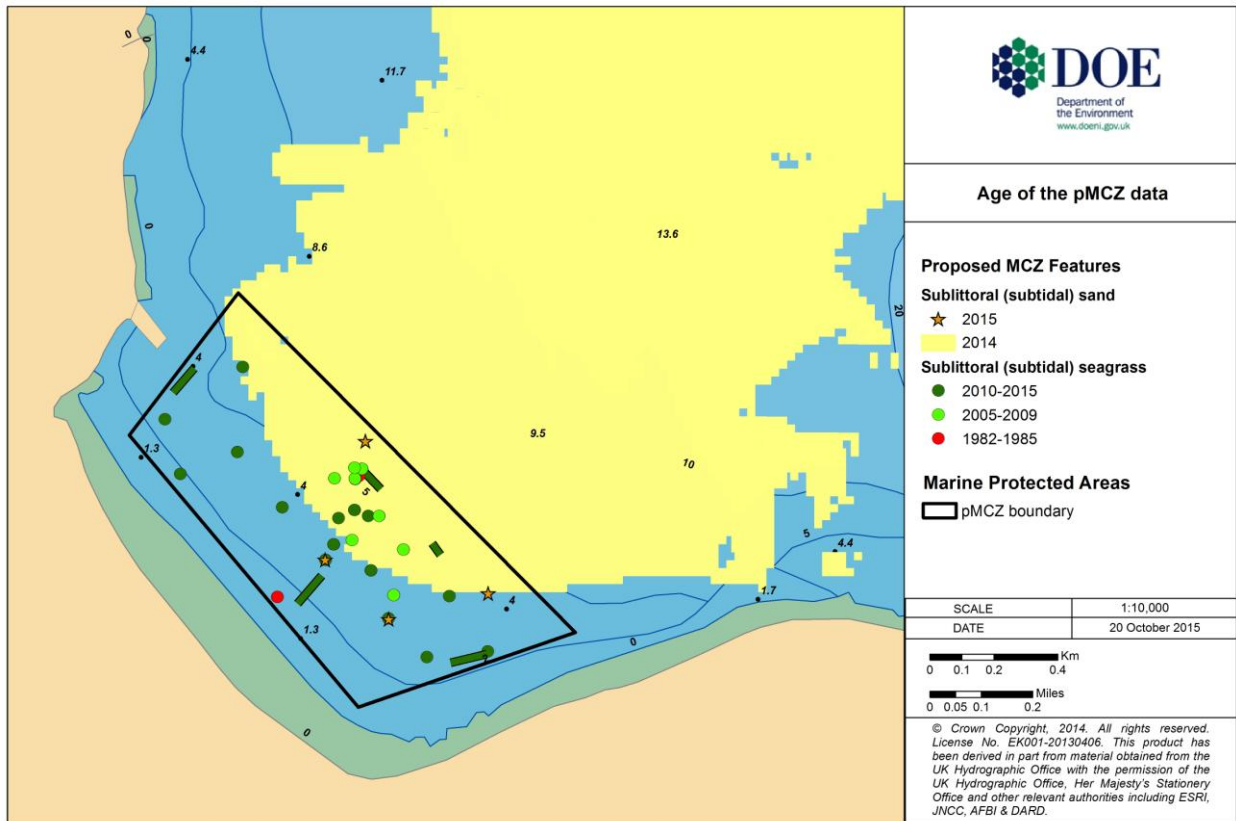


Figure 3 Age of the feature data collected in Waterfoot pMCZ

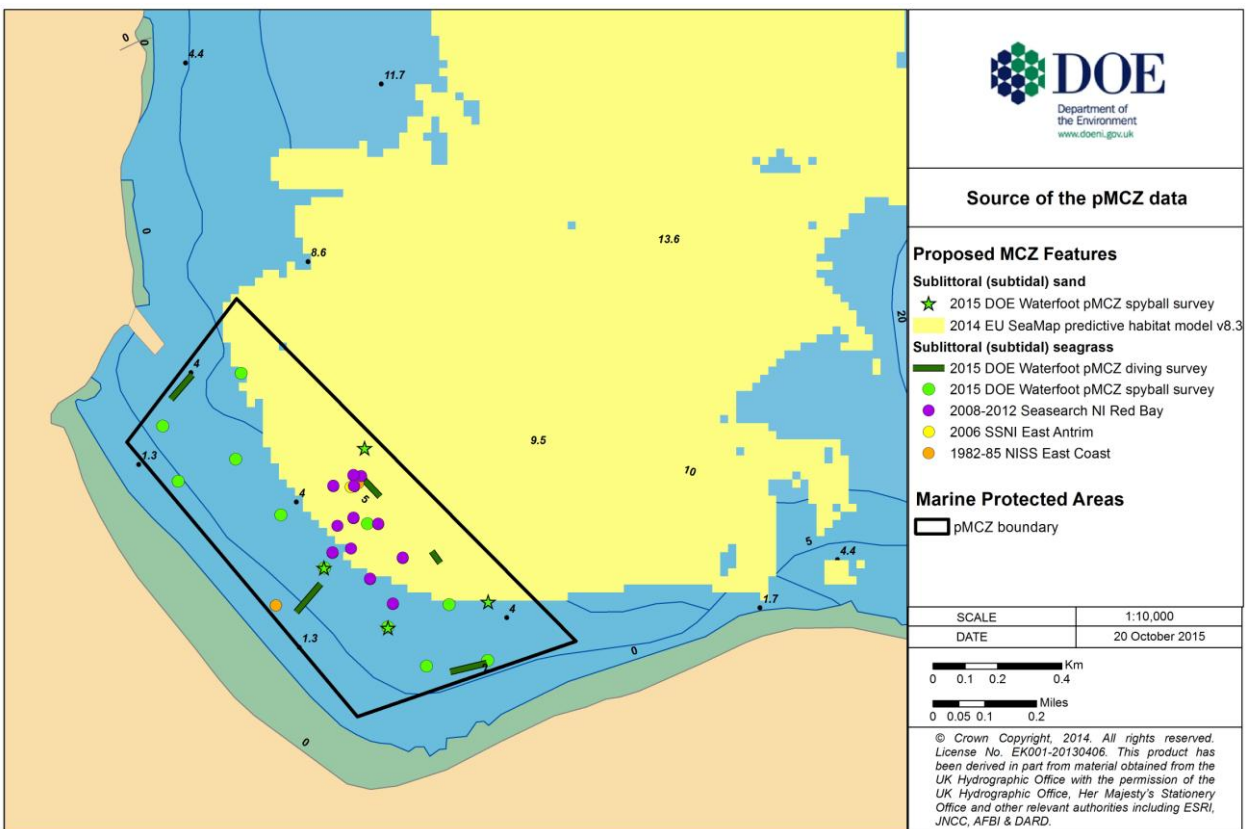


Figure 4 Source of the feature data collected in Waterfoot pMCZ

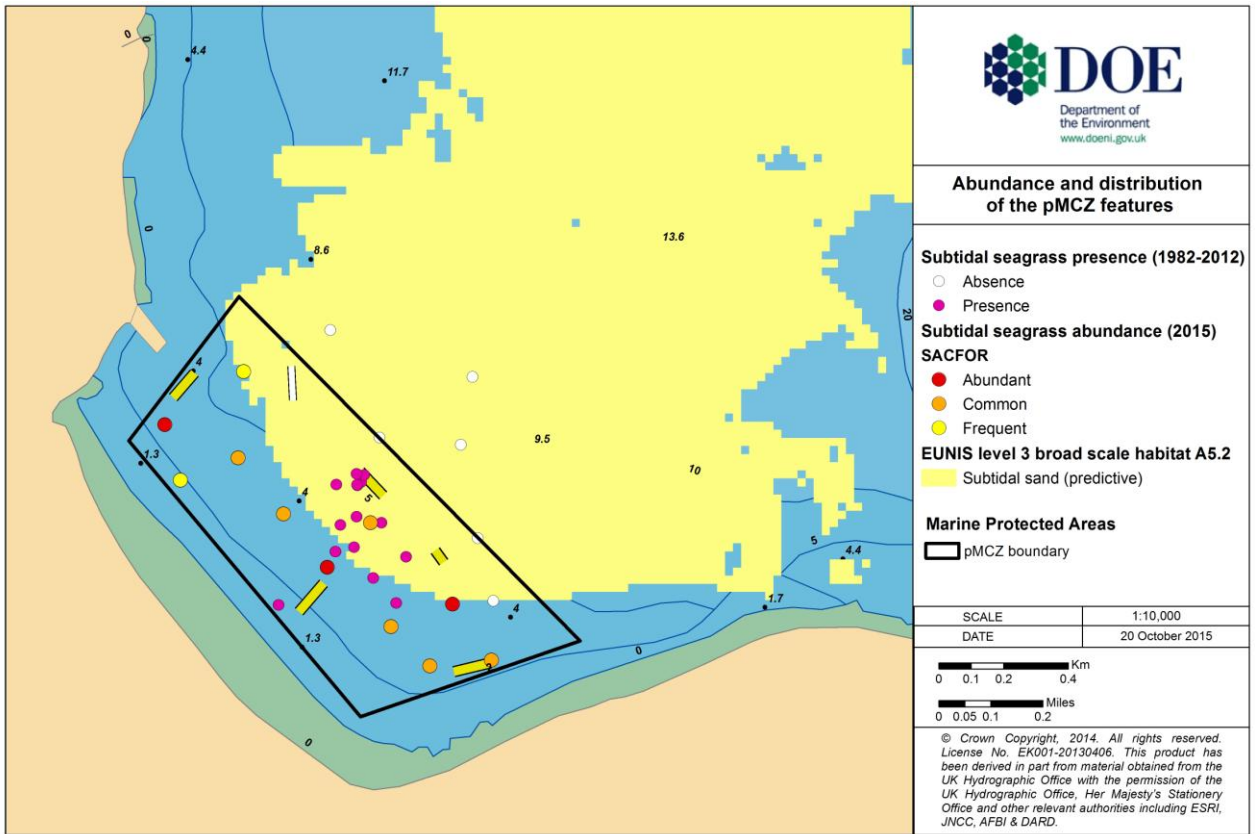


Figure 5 Abundance and distribution of feature data collected in the Waterfoot pMCZ

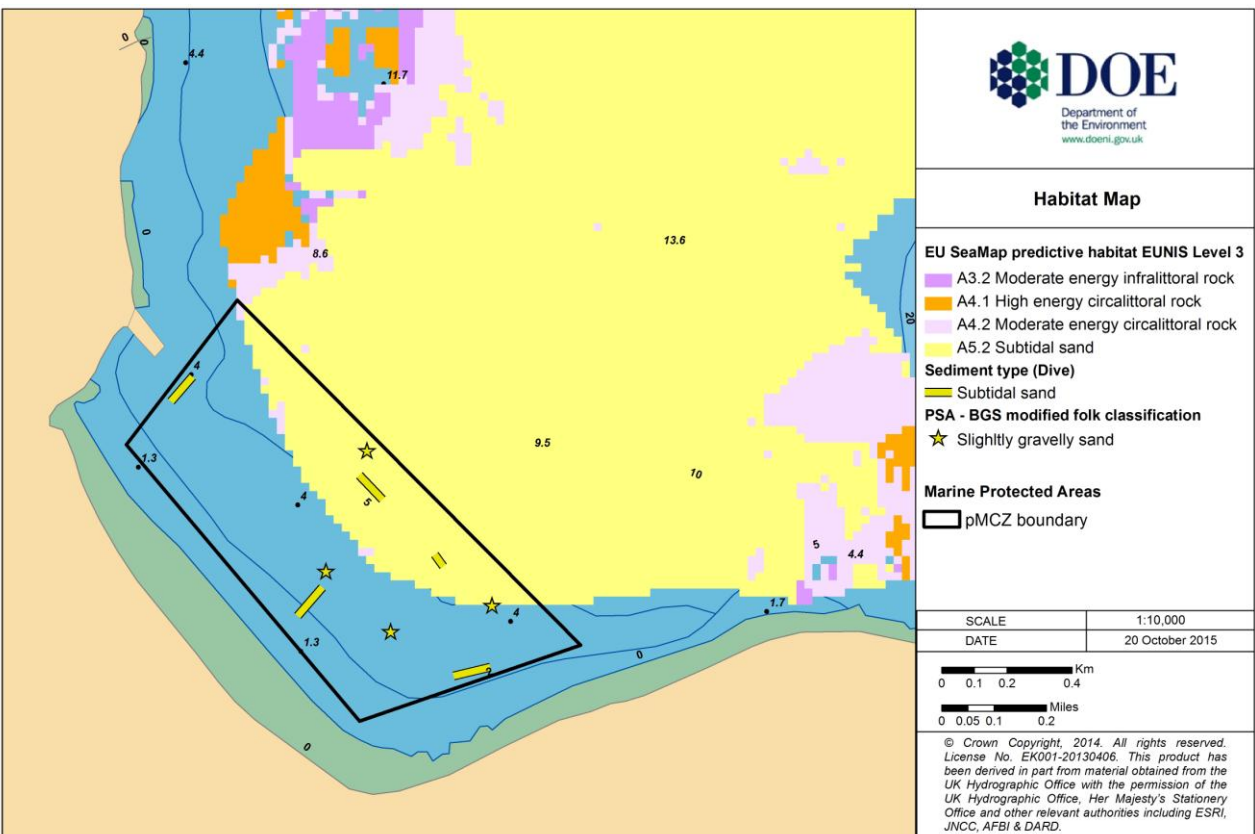


Figure 6 Habitat Map of Waterfoot pMCZ and surrounding seabed

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. http://www.doeni.gov.uk/niea/sublittoral_survey_northern_ireland_may06_to_may08.pdf	SG
³ Seasearch Red Bay survey 2008, 2009, 2012 - video tows (Marine Recorder database)	Seasearch Northern Ireland. Northern Ireland Summary Survey Report. 2008. http://www.seasearch.org.uk/downloads/N%20Ireland%20008%20summary.pdf	SG
	Seasearch Northern Ireland. Northern Ireland Summary Survey Report. 2009. http://www.seasearch.org.uk/downloads/NIreland%202009%20summary%20web.pdf	
	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	SG SS

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Data source (used in assessment)	Reference	Features covered
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/AFBI-DOE-QUB) Near shore habitat map	EMODnet. 2014. EUSeaMap: A broad-scale physical habitat map for European Seas.	SS
⁷ DOE side-scan survey, 2015	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 <i>Zostera</i> beds, Seagrass beds. http://qsr2010.ospar.org/media/assessments/Species/P0042_6_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

