ASSESSMENT AGAINST THE MCZ SELECTION GUIDELINES

Waterfoot Marine Conservation Zone (MCZ)

Subtidal seagrass (*Zostera marina*) bed

Department of Agriculture, Environment and Rural Affairs
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Document version control			
Version	**Date**	**Author**	**Comments**
Version 0.1	22/09/2015	Clara Alvarez Alonso	Waterfoot draft
Version 0.2	21/10/2015	Joe Breen, Clara Alvarez Alonso, Liz Pothanikat, Stephanie Bennett and Nuala McQuaid	Amendments
Version 0.3	16/11/2015	Clara Alvarez Alonso	Amendments
Version 1.0	28/10/2015	DOE Marine Division	Internal Consultation
Version 1.1	16/11/2015	Liz Pothanikat	Amendments
Version 2.0	14/12/2015	DOE Marine Division	Public Consultation
Version 2.1	01/12/2016	Liz Pothanikat and Clara Alvarez Alonso	Rebranding, updates & amendments
Version 3.0	24/02/2017	DAERA Marine and Fisheries Division	Designation

Distribution List		
Version	**Issue date**	**Issued to**
Version 1.0	28/10/2015	Internal distribution
Version 2.0	14/12/2015	DOE/DAERA Website
Version 3.0	24/02/2017	DAERA Website

Contents

Figures

Summary

The assessment against the Marine Conservation Zones (MCZs) selection guidelines in Northern Ireland Inshore Region (hereafter referred to as the NI Guidance) is a document produced as part of the evidence base, following the OSPAR design principles. This assessment helped to identify initial Areas of Search (AoS) and determine proposed boundaries and features for protection within them. This process supported the definition of final MCZ boundaries for designation. It also highlights where additional locations or features are required or whether a different size or shape is needed to develop the Marine Protected Area (MPA) network.

Following the NI Guidance the process includes five steps from the identification of the AoS (Stage 1) to the development of the pMCZs and finally designation as MCZs (Stage 5). Only locations which have passed through all the stages of the assessment are considered for formal designation and inclusion in the MPA network.

This document provides details of the assessment of Waterfoot MCZ against the selection criteria.

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
- Conservation Objectives and potential Management Options for Waterfoot MCZ
- Data Confidence Assessment for Waterfoot MCZ

History of development

Waterfoot has been designated as an MCZ for the protection of the habitat Seagrass beds (SG) on subtidal sediments, in this case Subtidal sand (SS). The biotope for this habitat feature is SS.SMp.SSgr.Zmar (*Zostera marina* beds on infralittoral clean sand or muddy sand).

SG was recorded for the first time in the Waterfoot embayment by the Department and National Museums during the Northern Ireland Sublittoral Survey (NISS) in 1982 (Erwin et al., 1986) and later through the Sublittoral Survey Northern Ireland (SSNI) in 2006 (Goodwin *et al*., 2011). Further work carried out by Seasearch Northern Ireland collected numerous records of SG in the Waterfoot Bay area from different surveys (2008, 2009 and 2012). Recent survey work completed by the Department (July and August 2015; June 2016) included underwater video/still images (spyball camera), infaunal grab samples, quantitative data on diving transects using quadrats and particle size analysis (PSA) which validated the SS seabed in the MCZ (slightly gravelly sand). The SG bed was described as good quality, with distribution limits and patchy coverage reported within the MCZ.

This MCZ was included in the proposals following a third party nomination by Seasearch (Seasearch recommendation, 2014). The boundary of the MCZ was drawn following the SG extent and distribution in the area. The northern boundary line was drawn following the edge of SG records at a depth of 5-7m to conserve the integrity and to represent the diversity associated with the SG ecosystem while taking into consideration information on the uses and activities in the area. For the other boundary lines a rational buffer from the coastline was included to ensure the conservation objectives were achieved with efficient management within the MCZ. The buffer was set at a minimum distance of 25m from the edge of the SG records.

Details on the supporting evidence are provided on the Waterfoot MCZ data confidence assessment.

Glossary of Terms and Acronyms

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

Conservation objective – A statement of the desired ecological/geological state (quality) of a feature (habitat, species or geological) for which the MCZ is designated

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)

EUNIS –The 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). This zone is dominated by erect algae, typically Kelp species.

MCZ – Marine Conservation Zone 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

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)

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

PMF – Priority Marine Feature - collective term for those features (habitats, species and geological/geomorphological features) which are considered to be of conservation importance in the Northern Ireland inshore region

pMCZ – Proposed Marine Conservation Zone

pMCZ Feature – Proposed Marine Conservation Zone feature(s) that will underpin the MCZ designation

PSA – Particle size analysis

NISS – Northern Ireland Sublittoral Survey

SG – Seagrass (*Zostera marina*) beds

SS – Subtidal (sublittoral) sand

SSNI – Sublittoral Survey Northern Ireland

VMS – Vessel Monitoring System

Waterfoot MCZ – Application of the MCZ selection guidelines

<table>
<tr><th colspan="4">Stage 1 - Identifying the Area of Search</th></tr>
<tr><td>Summary of assessment</td><td colspan="3">The Waterfoot AoS encompassed the MCZ feature Subtidal SG (Z. marina), which is currently the largest subtidal SG bed and the best known example in Northern Ireland (Seasearch, 2009). The habitat is described as ‘Uncommon’ in the UK by JNCC (Connor et al., 2004). SG appeared to be in good condition in the AoS and restricted to the small area that is within the pMCZ boundary. Although the general coverage of the bed was patchy, the bed had good density and coverage ranges from 10-79% in different locations.

Waycott et al. (2009) revealed that seagrass beds are declining worldwide. The feature is on the OSPAR T&D List, and is also a Priority Habitat in Northern Ireland (NI Habitat Action Plan, 2003) and in the UK (UK Biodiversity Action Plan, BAP, 2008).

SG presence is key for the functioning of the ecosystem, relating to the habitat and the coastal system as a whole. The habitat provides nursery grounds for important commercial fish, shelter and attachment surfaces for epifauna. Physical benefits include a reduction in water circulation, and stabilization of the sediment with protection from wave action. SG beds also help to reduce coastal erosion, improve the water quality by helping to reduce the risk of eutrophication (Terrados & Borum, 2004) and also act as a source of food and organic matter (Lancaster et al., 2014). SG is therefore considered of both economic and conservation importance (Davison & Hughes, 1998). SG beds are a carbon store and therefore have an important role in climate change mitigation (Duarte et al, 2013).

This habitat occurs in SS dominated by macrophytes, a broad scale habitat representative of Northern Ireland’s seas more generally.

Guideline met</td></tr>
<tr><th colspan="4">Detailed assessment</th></tr>
<tr><td>Protected features</td><td>Guideline 1a
Presence of key features</td><td>Guideline 1b
Presence of features at threat and/or decline</td><td>Guideline 1c
Presence of ecological resources/geological processes critical to functioning of the ecosystem</td></tr>
</table>

Biodiversity			
Subtidal (sublittoral) sand[1] (SS): - Seagrass (*Z. marina*) beds[2] (SG)	✓	✓ **OSPAR T&D**[3]	✓

[1] Broad scale habitat. EUNIS Habitat type A5.2 (level 3)
[2] SS component (subscale) habitat. Biotope - SG (*Zostera marina* beds on infralittoral clean sand or muddy sand) SS.SMp.SSgr.Zmar – EUNIS A5.533
[3] OSPAR list of Threatened and/or Declining Species & Habitats (OSPAR, 2009)

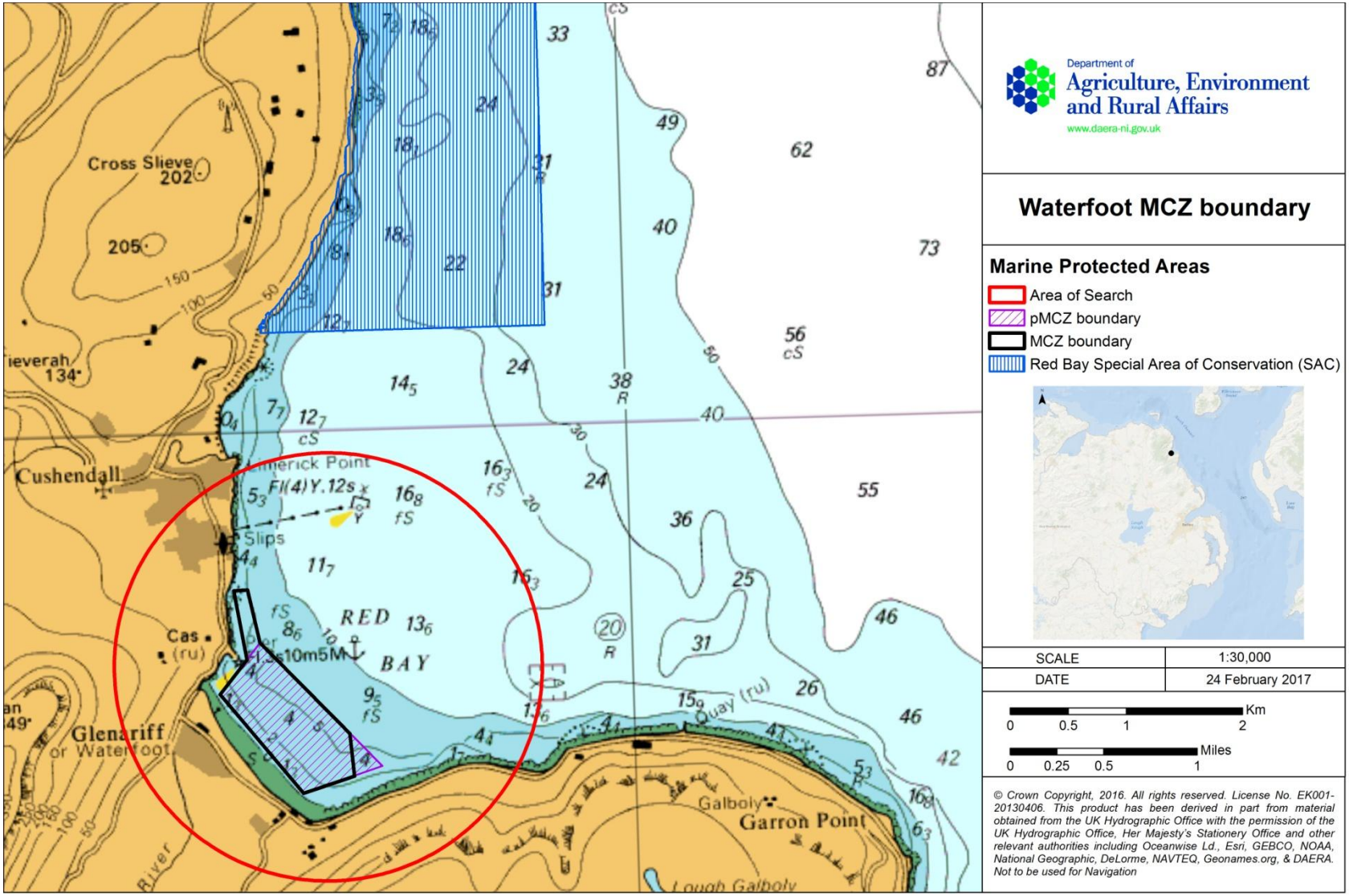

Figure 1 Location of Area of Search, initial proposed (p) boundary and designated boundary of Waterfoot MCZ

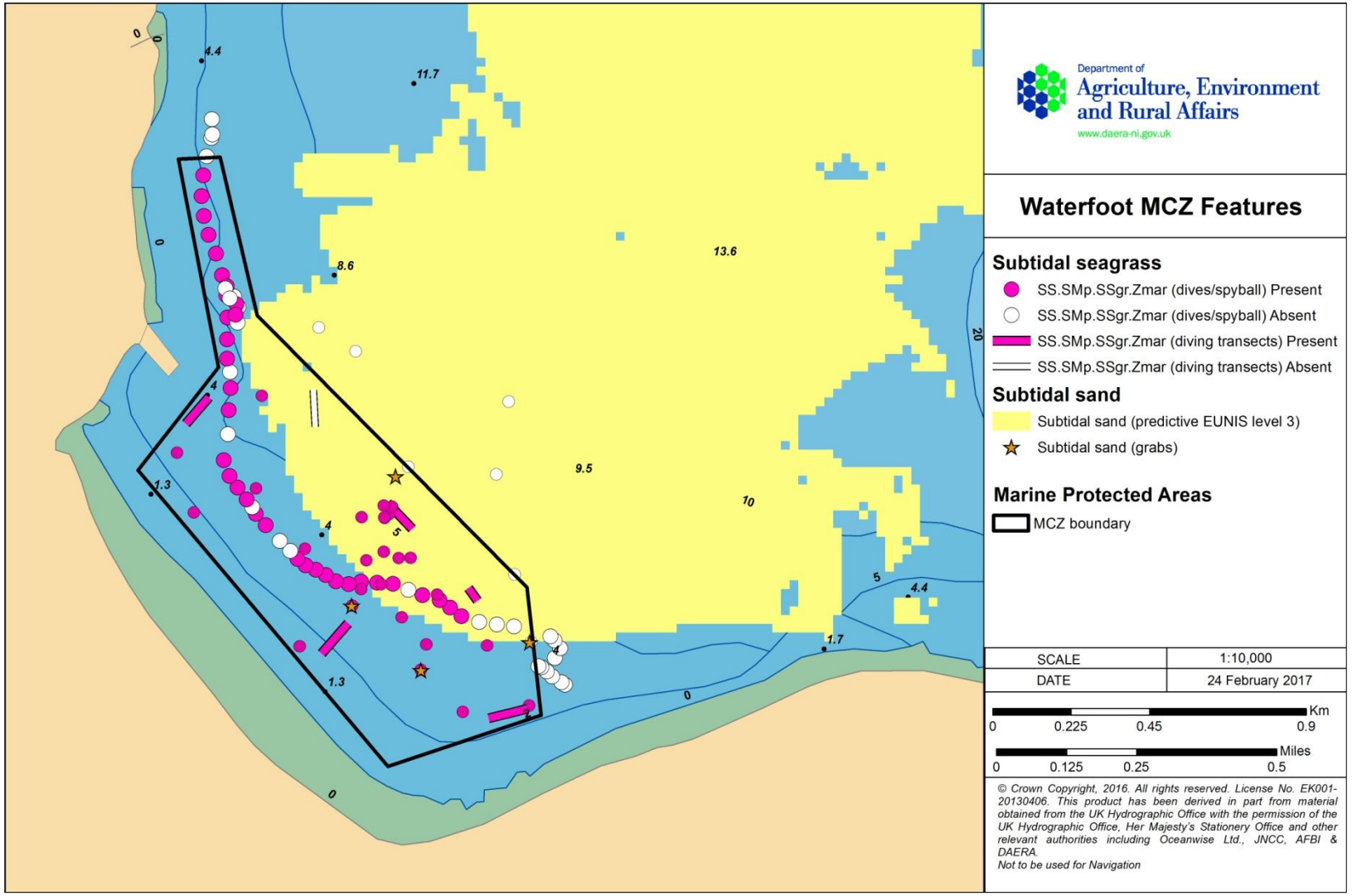

Figure 2 Distribution of the features in Waterfoot MCZ

Stage 2 - Prioritise the Area of Search based on quality of MCZ features contained	
Summary of assessment	Subtidal (sublittoral) SG beds are naturally diverse habitats, spatially and functionally linked to shallow subtidal coastal ecosystems such as Waterfoot Bay. The slightly gravelly sand seabed in the AoS is inhabited by a patchy but extensive and undisturbed SG bed (*Z. marina*) that currently represents the best known example and the largest bed in Northern Ireland (Seasearch, 2009; DOE, 2015). Waterfoot Bay is a popular area for recreational activities, but is not heavily impacted by human activity. As a consequence the pMCZ habitat remains in a near natural condition with little or no impact from human pressures. The MCZ habitat is vulnerable to a range of pressures that occur or may occur in the area associated with moorings and anchoring, creeling and potting, finfish aquaculture farms, discharges, infrastructure development, tourism and recreation and potentially navigational dredging. Therefore, the MCZ feature could be significantly impacted by human activity resulting in a moderate risk of not meeting the conservation objectives if activities increase or new developments occur in the area.
	Five of the six Stage 2 Guidelines have been met (2a-2e)
Detailed assessment	
Guideline 2a - The Area of Search contains a combination of features especially those that are functionally linked	
Seagrass bed on Subtidal (sublittoral) sand	SG meadows are functionally linked to coastal ecosystems (Lancaster *et al*., 2014). *Z. marina* beds are known to occur typically on SS (occasionally with a mixture of gravels) in sheltered bays (OSPAR, 2009). SG forms dense meadows on these subtidal sediments, typically in shallow waters up to a maximum depth of 10m (Davison & Hughes, 1998; James, 2004; OSPAR, 2009). The sheltered SS offer a protective environment for the plants to establish (Tyler-Walters & Wilding, 2008) whilst the SG has a functional significance for the seabed through stabilization of the sediment with rhizomes. This can act to reduce coastal erosion, may increase the biodiversity by dissipating wave energy and are an important source of organic matter (Lancaster *et al*., 2014). The presence of mollusc bivalves in the AoS, such as Ocean quahog (*Arctica islandica*), is due to the sheltered and stable habitat provided by the SG bed on SS (Tyler-Walters & Wilding, 2008). SG beds also provide shelter and nursery areas for flatfish and cephalopods while intertidal beds offer a food source for grazing over-wintering wildfowl. Moreover,

	leaves and rhizomes act as an attachment substrata for epibenthic species (Fletcher *et al*., 2012).
2a Result	**Guideline met**
Guideline 2b - The Area of Search contains features with naturally high biodiversity (for habitats only)	
Seagrass bed on Subtidal (sublittoral) sand	Within Waterfoot pMCZ the subtidal sediments are formed by the broad habitat type SS with biotope SS.SSa – EUNIS A5.2. This habitat is characterized by a range of taxa including bivalve molluscs (such as *A. islandica*, *Abra alba* or *Fabulina fibula*) and amphipods (JNCC, 2015). The polychaete *Arenicola marina* is abundant on the sandy sediment in the pMCZ. This SS also incorporates the biotope: SS.SMp.SSgr.Zmar – EUNIS A5.533 (SG: *Zostera marina* beds on infralittoral clean sand). In this habitat the community is usually dominated by *Z. marina* and associated biota (JNCC, 2015). The more sheltered locations (with fine sands) are generally the richest in terms of species abundance and density (Moore *et al*., 2004). Cover of SG in the pMCZ is dense in some places, but varies considerably across the bed. The seagrass forms large patches with areas of bare sand or mixed algae in between or attached to the seagrass fronds(including *Chorda filum*, *Porphyra leucosticta*, *Hypoglossum hypoglossoides*, *Ulva lactca,* sparse sugar kelp *Laminaria saccharina* and many others) (Seasearch, 2009). Epiphytes may be a prominent component of seagrass ecosystems when ambient nutrient concentrations are high (OSPAR, 2009). SG beds are an important source of food and shelter for many fish larvae and crustacean species (Davison & Hughes, 1998). Juvenile flatfish and gadoids are abundant and several other fish species including Gurnard, Gobies and Brill are common. Spider crabs such as *Maja brachydactyla* and *Macropodia sp.,* Hermit crab *Pagurus bernhardus* and Littoral crab have been recorded in the pMCZ. Additionally grazers such as gastropods (Common periwinkle *Littorina littorea,* Grey top shell *Gibbula cineraria*) are very common on the SG beds. Some cephalopods like Cuttlefish, *Sepia officinalis*, may lay their eggs on the plants (Tyler-Walters & Wilding, 2008).
2b Result	**Guideline met.**
Guideline 2c - The Area of Search contains coherent features not smaller fragmented ones	
Seagrass bed on Subtidal	Fragmentation is a major cause of SG decline. It is known that *Z. marina* coverage is highly variable and beds are typically patchy and dynamic (Hill *et al*., 2010). Natural

(sublittoral) sand	disturbance includes waves and currents while they are also heavily impacted by coastal activity (Davison & Hughes, 1998; Reed & Hovel, 2006; OSPAR, 2009). In the UK, typical SG beds range in size from 100m^2 to a few km^2 (Foden & Brazier, 2007) while many small patches exist resulting from seed dispersal and seasonal variance. Although there is little information about the spatial and temporal variability of the SG bed in Waterfoot pMCZ, recent evidence collected during the growing season suggests that although patchy, this SG bed is in good condition and contains reproductive plants. Moreover, Waterfoot currently supports the largest subtidal SG bed known in Northern Ireland with average coverage ranging between 10-79% (abundances from frequent to abundant on the SACFOR scale (JNCC, 2014)). Additionally, camera and grab sample data in the area confirmed the presence of continuous SS habitat in the area comprising slightly gravelly sand. The pMCZ is considered to be stable and not fragmented and anthropogenic activities may have not affected the suitability of the sediment for SG communities.
2c Result	**Guidelines met**
Guideline 2d - The Area of Search contains features considered least damaged/more natural	
Seagrass bed on Subtidal (sublittoral) sand	No indication of change or damage to this pMCZ feature was reported, or was evident in recent camera and diving surveys performed by the Department (DOE, 2015 and DAERA, 2016). The proposed habitat is thought to be in near natural condition within the pMCZ boundary, according to the indicators of naturalness and damage taken from MarLIN sensitivity data (Tyler-Walters & Wilding, 2008; Lancaster *et al*., 2014). There is recent fishing Vessel Monitoring System (VMS) data to suggest a small area in the pMCZ may have been dredged or trawled. The area is coincidental with low SG cover and exhibits a generally patchy distribution. This highlights the impact of mobile gear on such sensitive habitats and justifies the management required to prohibit the use of mobile fishing gear within the pMCZ. It is known that SG is highly sensitive to human activity, and although the anthropogenic disturbance in the AoS overall is minimal, anchoring has been suggested to pose a risk to the habitat, and could be linked to the patchiness of the bed by physical disturbance. Recent dives carried out by Seasearch NI confirmed that the

	SS in the area was in good condition and this was verified by the Department in 2015 and 2016 through spyball camera footage, diving survey, PSA and side-scan data.
2d Result	**Guidelines met**
Guideline 2e - The Area of Search contains features at risk[4] of damage by human activity	
Seagrass bed on Subtidal (sublittoral) sand	SG habitat is highly sensitive and vulnerable to current and future human activity. On the basis of the risk assessment (see Annex A), undertaken at a local level of the Waterfoot AoS, this feature is considered to be at **moderate** risk of damage associated with anthropogenic activities occurring in the area. This is a result of potential exposure to pressures associated with mooring and anchoring (considered to present a high risk) and fishing (dredging is considered to present a high risk.
2e Result	**Guidelines met**
Guideline 2f -The Area of Search contains historic sites which could be restored	
2f Result	**Guideline not met as this is not applicable**

[4] Risk of damage to the feature(s) is based on the sensitivity of the feature to activities and their associated pressures. The information is organised by the type of activity, and briefly describes potential impacts on the features and potential management options. The grouping of activities was based on the standardised UK pressures-activity matrix (http://jncc.defra.gov.uk/pdf/Final_HBDSEG_P_A_Matrix_Paper_28b_Website_edit%5B1%5D.pdf), as developed by JNCC (2013), which classed similar activities that exerted similar pressures together. Since the public consultation, a new Pressures-Activities Database (PAD) has been developed by Cefas and APBmer (2015). This database and the list of activities are currently under review by JNCC in conjunction with each country agency. The Department has used this database and the improved activities list along with a revised methodology (Marine Evidence based Sensitivity Assessment, MarESA, developed by JNCC and Natural England) to review the vulnerability assessments for the MCZs (where applicable). The degree to which a feature is exposed to activities associated with pressures to which it is sensitive in each MCZ region was assessed to provide a qualitative measure of risk. Risk assessments for the various activities were examined to produce an overall qualitative risk assessment for each MCZ. The management options will only consider those activities assessed as capable of affecting the features of the MCZ, based on the risk of damage assessment. More detailed information on the process can be found on the papers: Guidance on the development of Conservation Objectives and potential Management Options and Waterfoot Conservation Objectives and potential Management Options (the latter contains the risk assessment for Waterfoot MCZ).

Stage 3 - Assess the size of the Area of Search to ensure this is sufficient to maintain the integrity of features protected	
Summary of assessment	The pMCZ reflects the distribution of the SG bed in Waterfoot Bay and the range of SS sediment suitable for colonisation by the main habitat component species. The boundary is suitable for maintaining the integrity of the habitat feature for which the pMCZ is being considered.
	Guideline met
Detailed assessment	
The size of the Area of Search should be adapted where necessary to ensure it is suitable for maintaining the integrity of the features for which the pMCZ is being considered. Account should also be taken where relevant, of the need for effective management of relevant activities	
Seagrass bed on Subtidal (sublittoral) sand	The Waterfoot pMCZ boundary was drawn around all the *Z. marina* records in the bay to ensure the integrity of the entire Subtidal SG bed on the SS. The depth limit of *Z. marina* distribution (4-10m) was taken into account on the outer boundary. SG extends right up to the harbour in Waterfoot. A buffer of 25m of sediment on the coastal sides was allowed for potential further colonisation (by rhizome extension or reproductive expansion), recovery from disturbance and changes on size and/or position of the meadows between years (Frederiksen *et al*., 2004; Terrados & Borum, 2004). Furthermore, relevant activities occurring in the area were considered during the setting of the boundary size and shape, aiming for effective management within the pMCZ. The boundary incorporates a representative range of SS supporting individual SG meadows. The area of SS in the AoS has been verified by grab samples and PSA analysis, predicted habitat models and biotope assignment from photographic/video images.

Stage 4 - Assess the effectiveness of managing features within the proposed Marine Conservation Zone (pMCZ)	
Summary of assessment	There is potential for management measures to be implemented successfully to achieve the conservation objectives of the pMCZ feature.
	Guideline met. As a result the original AoS and subsequent pMCZ progresses as potential area for MCZ designation to Stage 5.
Detailed assessment	
There is a high probability that management measures, and the ability to implement them, will deliver the objectives of the MCZ	
The conservation objective for the Waterfoot MCZ habitat is to '*maintain the feature in favourable condition*'. The current available evidence indicates that the SG bed is in near natural condition within the MCZ (see 2c&d); however, there are a number of activities (present and future) that are capable of adversely affecting the feature and therefore there is a need to consider whether additional management is required. This will aid in the achievement of the conservation objectives for the MCZ feature (see 2e). There are several management options to support the conservation of the feature in Waterfoot MCZ, such as implementing fisheries restrictions, licensing procedures with Environmental Impact Assessment (EIA) for future developments or activities (undertaken by the Department), and assessments for new moorings or potentially creating a visitor mooring area. Under the Marine Act (Northern Ireland) 2013 the Department also has powers to introduce bye-laws or enforce activities if required. Promoting awareness of the importance of SG beds and implementing codes of conduct could reduce small-scale disturbances and minimise trampling and anchor damage. Potential management options for the MCZ feature are provided in detail in the Waterfoot MCZ Conservation Objectives and Potential Management Options document.	

Stage 5 - Assess the ecological coherence to prioritise between different areas based on the contribution to the MPA network			
Summary of assessment	The MCZ makes a contribution to the MPA network for the OSPAR T&D habitat Subtidal SG beds in OSPAR Region III. Also, this is the only MCZ put forward for Subtidal SG as it is the best known example in Northern Ireland and contributes to replication and connectivity with other SG beds within MPAs in the British Isles. The site also makes a contribution towards the MPA network for the broad scale habitat SS in OSPAR Region III.		
	Guideline met		
Detailed assessment			
The potential area contributes significantly to the coherence of the MPA network in the seas around Northern Ireland			
Feature	**Representation**	**Replication**	**Adequacy**
Seagrass bed on Subtidal (sublittoral) sand	In the UK and Ireland, SG beds are restricted to sheltered sea loughs, bays and inlets with uncontaminated water (Lancanster *et al*., 2014). SG habitat is described as uncommon in the UK (Connor *et al*., 2004). The MCZ is a stronghold for this habitat feature as it contains the largest bed of Subtidal SG and the best known example in Northern Ireland (Seasearch, 2014). This habitat is on the OSPAR T&D List, the UK Biodiversity Action Plan (UK BAP,	There is replication of this feature within the existing MPA network in Northern Ireland. Subtidal SG is a protected MCZ feature in Strangford Lough MCZ and a few small beds occur in existing SACs such as Rathlin Island SAC. There is also replication within the wider UK MPA network. The SS protected within this MCZ will contribute towards replication of this feature within OSPAR Region III. The feature	The whole SG bed is included in the MCZ boundary. For Subtidal SG habitat, adequacy is best achieved by meeting viability, replication and connectivity principles (Natural England & JNCC, 2010). An area of SS within the bay is included in the MCZ. For SS adequacy, a minimum proportion target of 15% is suggested to support the network of MPAs (A5.2) (Natural England & JNCC, 2010). At present, the estimated area of SS in Northern Ireland is 1642.86km^2 while 159.32km^2 of this

	2008) and is also a Priority habitat in Northern Ireland (NI Habitat Action Plan, 2003). SG beds are considered key for conservation due to their ecological significance (OSPAR, 2008; Barnard *et al.* 2014). SS sediments with fine gravels are a key broadscale habitat supporting the species *Z. marina* and associated communities. These two features are considered to be functionally linked as SG beds stabilises sediments and can provide a food source for waterfowl (Davison & Hugh, 1998).	also contributes towards replication within NI waters as it is also a feature for Outer Belfast Lough MCZ.	total area is currently protected within the existing MPA network. Therefore a current proportion of 9.7% is protected within Northern Ireland's MPAs. The addition of the MCZ (0.811km^2) increases this area to 160.131km^2, and the proportion of SS protected to 9.75% (JNCC EU SeaMap 2014).
	Viability	**Connectivity**	**Management**
	Individual SG plants have a small home range of a few cm^2 but the clone complex, interconnected by a subterranean	Not applicable[5]. *Z. marina* maximum dispersal distance is 60km (Hill *et al*., 2010). There is,	There is potential for management measures to be implemented successfully to achieve the conservation

[5] Connectivity between different regional networks and individual MPAs has only been assessed for some mobile species and large scale features. There is currently little evidence on linkages for low mobility species and sea-bed habitats in UK waters. More modelling work for assessing linkages is needed

	network of rhizomes can extend to many metres (Hill *et al*., 2010). They also have the potential to disperse over large distances (up to 60km) through seed dispersal and so large areas (2827km^2) would be required to protect the whole life-cycle (Hill *et al*., 2010). JNCC guidance suggests a minimum viable patch diameter of 0.5km (Natural England & JNCC, 2010). An area of 188m^2 is thought to be appropriate to protect the genetic viability of most species in this habitat. Additionally, it is recommended that where the feature occurs in a restricted location protection of the whole patch is required to meet viability criteria (Hill *et al*., 2010). The MCZ boundary covers the whole SG bed extension with an area of 811m^2. The minimum diameter in the MCZ is 110 m. Therefore the boundary is	therefore, a possible connectivity with Scottish MPA network on the West coast for SG within this distance.	objectives of the MCZ feature through fisheries management measures, licensing activities (through bye-laws) and education.

	thought to be adequate for viability of the habitat.		
	Best available evidence	**Economic, cultural and social issues**	
	Best available evidence has been used to arrive at the decision regarding the feature and boundary development. Refer to the Data confidence assessment for Waterfoot MCZ for further details.	For further details see Waterfoot MCZ Conservation Objectives and potential Management Options paper and the Regulatory Impact Assessment (RIA).	

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

ISBN 978-1-84807-700-3

Department of Agriculture, Environment and Rural Affairs
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