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ASSESSMENT AGAINST THE MCZ SELECTION GUIDELINES

Rathlin Proposed Marine Conservation Zone (pMCZ)

Black guillemot (*Cepphus grylle*) @jdoherty




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Version 1.0	28/10/2015	Internal Consultation
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Contents

Summary

The assessment against the Marine Conservation Zones (MCZs) selection guidelines in Northern Ireland Inshore Region is a document produced as part of the consultation evidence base, following the OSPAR design principles. This assessment helps to identify Areas of Search (AoS) and determine features proposed for protection within them. It also highlights where additional locations or features are required or when a different size or shape is needed to develop the MPA network.

Following the Guidance on Selection and Designation of MCZs in Northern Ireland Inshore Region the process includes five stages from the identification of the AoS (Stage 1) to the development of the MCZ proposals (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 Rathlin pMCZ against the selection criteria.

Additional information on Rathlin 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
- Conservation Objectives and potential Management Options for Rathlin pMCZ
- Data Confidence Assessment for Rathlin pMCZ

History of development

Rathlin Island pMCZ has been proposed as a potential MCZ for Deep-sea bed (DSB), the species Black guillemot (BG) and Geological/geomorphological (Geodiversity, GD) features indicating past changes in relative sea level (submerged lagoons and sea arches).

Predictive seabed habitat mapping (JNCC EU SeaMap; McBreen *et al.,* 2011) identified the only known location of DSB (>200m) in Northern Irish coastal waters off the north coast of Rathlin Island. This data suggests the area of DSB habitat is composed of mixed sediment substrate with areas of sand and upper slope rock reef. Recent survey work completed by AFBI (June 2014 and February 2015) confirmed these findings. The northern boundary was drawn focusing on ensuring the integrity of the proposed feature DSB was included.

The waters between Bull Island and Church Bay have been identified as an area that supports an important population of BG. The nesting site for BG is located on the cliffs of Rathlin Island and are afforded indirect protection through SAC (Annex I Habitat - Vegetated sea cliffs) and SPA (Annex II - Seabird assemblage breeding population which also nest on the cliffs) designations. The Rathlin coastline provides feeding hotspots for

BG with the Church Bay area used primarily for loafing and breeding display behaviour. Studies indicated that BG typically forage in depths up to 50m and often within 2km of nesting sites (Cairns, 1992; Marine Scotland & SNH, 2012; Madsen *et al.*, 2013). Consequently, following discussions with RSPB and NIEA Ornithologists the seaward boundary of the pMCZ was extended to encompass >84% of sheltered waters (<50m) that lie within 2 km of the Island.

GD features were identified using archaeological applications to extract pre-historic landscape features from high resolution JIBS data (Quinn *et al.*, 2008). Submerged cliffs and caves were recorded in dive surveys during 1984 and 1985 as part of the NI Sublittoral Survey (NISS, Erwin *et al.,* 1986), while Seasearch Northern Ireland Surveys (2005, 2012 and 2013) also recorded the presence of cliffs and a submerged archway. Analysis of the JIBS data also revealed a paleo-lagoon basin. Furthermore, analysis of the JIBS data also provided 3D bathymetric topography models of the seabed enabling visualisation of the seabed landscape features. These GD features provide us with an insight into the pre-historic landscape formed during lower sea levels.

Initially there were two Areas of Search (AoS), one to the north for DSB and one to the south for BG, however, the GD features were not captured by either of these so a new AoS was drawn to encompass all three.

Glossary of Terms and Acronyms

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

AFBI - Agri-food and Biosciences Institute

BG - Black guillemot

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

DSB - Deep-sea bed is a term used to describe sublittoral habitats found at depths >200m with the EUNIS Broad scale habitat Deep-sea bed (EUNIS code: A6)

Epifauna - Animals living on the surface of the seabed or a riverbed, or attached to submerged objects or aquatic animals or plants

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

GD - Geodiversity - a term to describe Geological and geomorphological features.

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

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 an 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

RIA - Regulatory Impact Assessment

TSS - Traffic Separation Scheme – defined as traffic-management route-system ruled by the International Maritime Organization or IMO. The traffic-lanes (or clearways) indicate the general direction of the ships in that zone.

VMS - Vessel Monitoring System

Rathlin pMCZ – Application of the MCZ selection guidelines

Stage 1 - Identifying the Area of Search

Summary of assessment	Initially there were two AoS proposed for Rathlin: • 'Rathlin Deeps' (to the north) which was identified as the only area in Northern Irish coastal waters with water deeper than 200m where DSB[1], is found. It is particularly unique given the steep drop off in depth, its close proximity to land and contains a range of deep subtidal sands, mixed sediment and rock (AFBI, 2015). • 'Rathlin - Church Bay' (to the south) was identified as an important area for BG. RSPB have been recording this species on Rathlin Island as part of the Seabird Monitoring Programme since 1999 (JNCC, SMP). When the Geological/geomorphological (Geodiversity- GD) pMCZ features were mapped it became clear that they did not fall within either AoS, so a new AoS was drawn to include all three features. Rathlin Island was identified as an area with excellent examples of submerged archways, gullies, cliffs and a paleo-lagoon which are all indicators of the prehistoric landscape (Quinn *et al*., 2008). A number of these features, such as the archway and gullies, have also been identified as important habitats for a diverse range of flora and fauna including the only recorded location of the cup coral (*Caryophyllia inornata)* in Northern Irish waters. *C. inornata* is a Priority Marine Feature (PMF) in Northern Ireland (Goodwin *et al*., 2011a,b).
	Guideline met.

Detailed assessment			
Proposed protected features	**Guideline 1a** *Presence of key features*	**Guideline 1b** *Presence of features at threat and/or decline*	**Guideline 1c** *Presence of ecological resources/geological processes critical to functioning of the ecosystem*
Biodiversity			
Deep-sea bed (DSB)	✓	*Representative feature*	
Black guillemot (BG)	✓	**✓ (IUCN Red List & Amber list of Birds of Conservation Concern in Ireland)[2]**	

[1]Deep-sea bed is a term used to describe sublittoral habitats found at depths >200m and is not to be confused with the EUNIS Broad scale habitat Deep-sea bed (EUNIS code: A6).

[2] BG is a currently listed on the IUCN (International Union Convention for the Conservation of Nature and Natural Resources) Red List but the population worldwide appears to be increasing so is listed as a species of least concern. However, the Northern Ireland population is decreasing (Leonard & Wolsey, 2014). They are also defined as a Priority Marine Feature (PMF) in Northern

Geodiversity (GD)			
Features indicating past change in relative sea level (vertical cliff, sea arches, gullies)	✓		**✓(Provide key habitat for a range of unique flora and fauna)**

Ireland. Given the conservation importance of this species it is proposed as a representative feature.

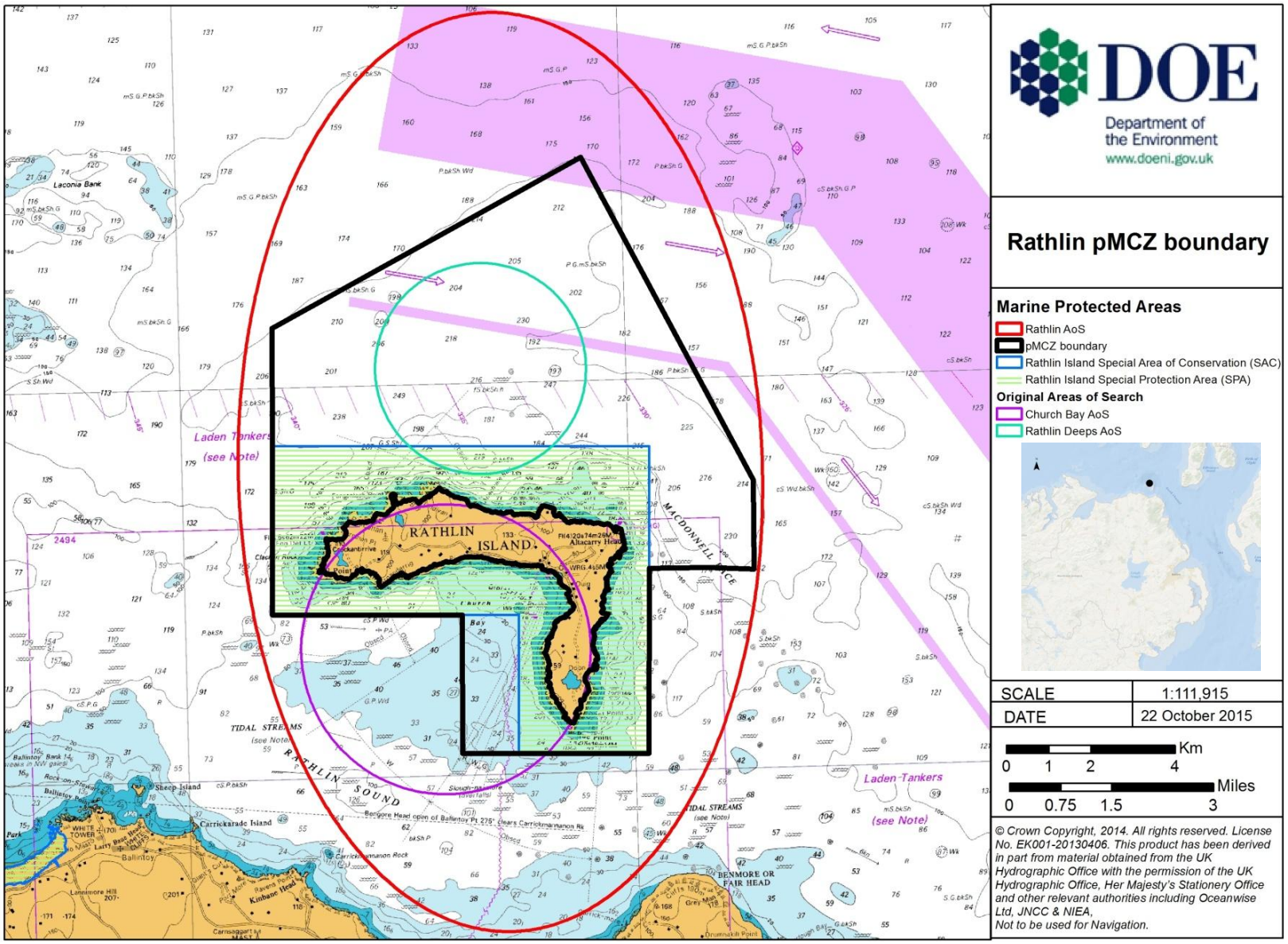

Figure 1 Location of Area of Search and the proposed boundary of Rathlin pMCZ

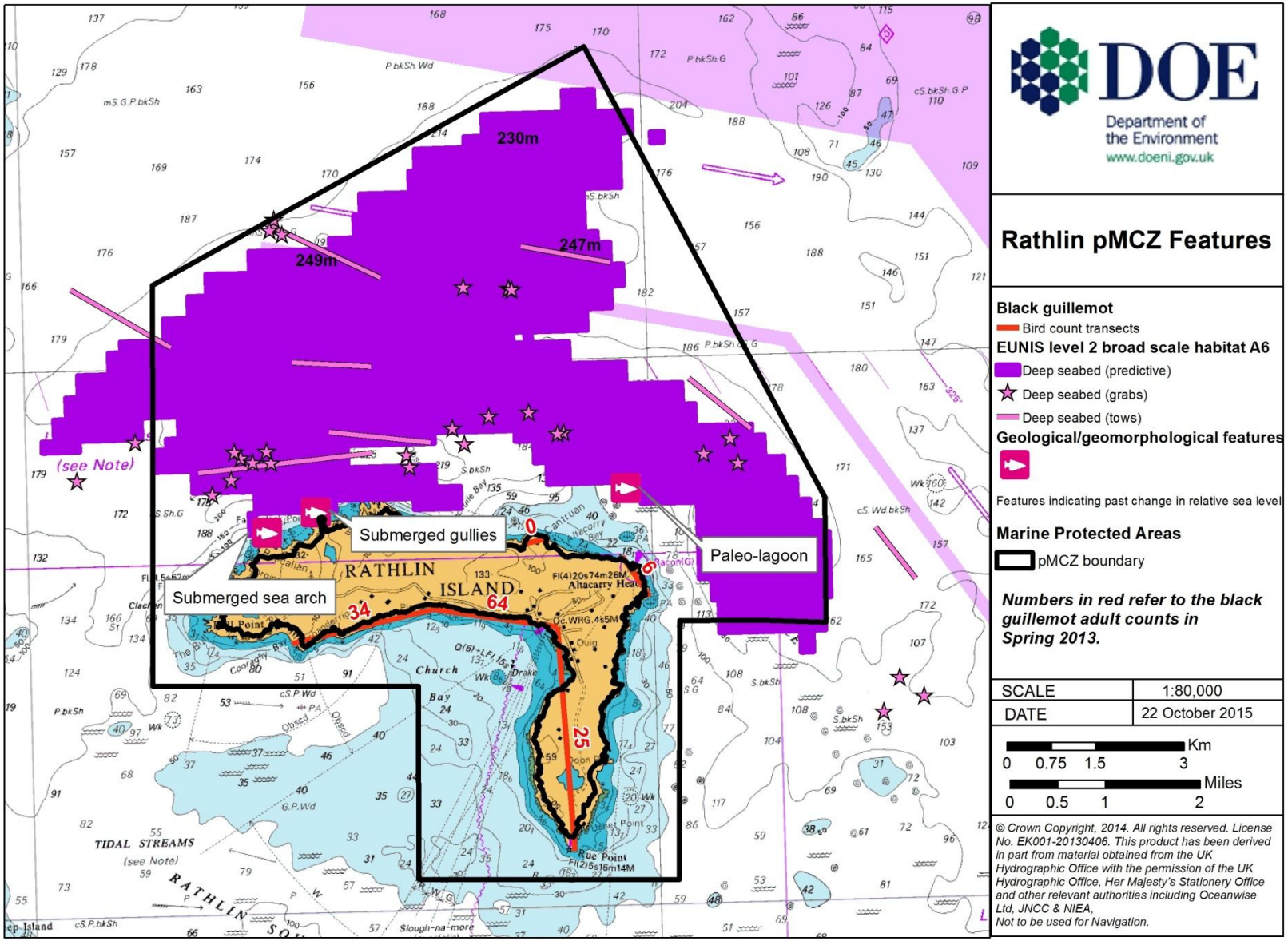

Figure 2 Distribution of the pMCZ features in Rathlin

Stage 2 - Prioritise the Area of Search based on quality of pMCZ features contained

Summary of assessment	Rathlin pMCZ is proposed for three pMCZ features: DSB, BG and GD. DSB could, combined with the strong tidal flow and complex bathymetry unique currents in this area, contribute to the rich biodiversity in the waters that surround Rathlin Island including prey for BG. The GD features that are found along Rathlin's coastline also provide a habitat for a wide variety of flora and fauna, some unique to this area. The proximity of these features close to Rathlins coastline and the rocky nature of the seabed in this area afford the GD features a degree of protection from damaging activities such as fishing with mobile gear. They are considered to be in natural condition. Evidence indicates that the DSB (due to its location and depth) has not been extensively fished and is therefore in a near natural state. The DSB located to the north of the pMCZ extends into a traffic separation scheme (TSS, which is a busy shipping area), however, this has little or no impact as the marine traffic is transiting the area. In addition, the depth and exposure of the DSB means anchoring is highly unlikely to occur. The BG population in Northern Ireland has fluctuated over time, but is showing an overall decline and the counts on Rathlin reflect this trend. The BG population on Rathlin are considered at risk which is reflected in the conservation objective for this pMCZ feature which is set to 'recover' to favourable condition. Rathlin is not heavily impacted by the range of activities presently occurring in the area. The proposed GD and DSB features are deemed to be in a natural and relatively undisturbed state. The pMCZ features are vulnerable to a range of pressures (such as trawling and energy installations) but the current level of pressure is such that the risk is considered low. However, future changes in pressure intensity may increase the risk. BG are vulnerable to a range of human activities currently occurring within the pMCZ. This species is currently considered at moderate risk, if the activity level increases or new developments occur in this area the risks would be significantly higher.
	<u>Five</u> 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
The DSB to the North of Rathlin is unique to Northern Ireland's coastal waters. It is located in area where the Atlantic Ocean and Irish Sea water masses mix, and this is thought to have contributed to the biological diversity found around Rathlin Island (Strong, 2010). This possibly influences the availability of prey species for BG in the shallower, more sheltered

waters of Church Bay. The GD features are located primarily along the North shore but, while they provide habitat for a wide range of species (some only found in this area) they are unlikely to provide a clear functional link to either BG or DSB. The Department has followed the Scottish approach[3] in enhancing the contribution of current protected areas by ensuring that the pMCZ overlays existing SPA/SAC boundary. BG nests are located in areas that lie within the SPA/SAC boundary and are therefore offered a degree of protection under these designations. It is worth noting that BG does not appear on the EC Birds Directive and are therefore not currently protected as a species on Rathlin Island. Rocky reef, currently protected under the existing SAC designation, provides habitat for butterfish and blennies (prey species of BG - Leonard and Wolsey, 2014) which are often found in the kelp forest growing on the reef around Rathlin's shoreline.	
2a Result	**Guideline partially met.**

Guideline 2b The Area of Search contains features with naturally high biodiversity (for habitats only)	
DSB	Recent survey work carried out by AFBI (2014-2015) show that the DSB habitat to the North of Rathlin contains deep mobile sediment; mostly shell debris, coarse sands and cobbles with boulders in varying proportions across the site. The site harbours a range of species characteristic of scoured environments with little sediment deposition. In areas of more stable cobbles and boulders erect epifauna were recorded, while the majority of hard substrates had encrusting bryozoans, keel worms and barnacles. In the deepest areas the Dahlia anemone (*Urticina sp*) was characteristic in very high densities; closer to shore the seabed is dominated by coarser sediments with Ross worm (*Sabellaria spinulosa*). Larger boulders were colonised by Hydroids (*Tubularia indivisa*) and Soft coral (*Alcyonium digitatum*) while Ling (*Molva molva*) and Cuckoo rays (*Leucoraja naevus*) were present in the deep waters off the north of Rathlin. The Peacock worm (*Sabella pavonina*) was found throughout the survey area and on fairly coarse substratum; this is atypical, as it is usually found on muddy/sandy sediment in shallow waters. Horse mussel (*Modiolus modiolus)* shell was found in the shell debris. In addition, live clumps of *M. modiolus* were also collected in grab samples from sites in gravelly-sand sediment at 230m depth (AFBI, 2015). This broadscale habitat can be associated with cold water coral (*Lophelia)* reefs although at present this habitat has not been recorded in the Area of Search. The north and northwest of the AoS contains areas of hard substrate in deep water exposed to strong currents which provide ideal conditions for *Lophelia* reefs (Hall-Spencer and Stehfest, 2009); however, further survey work is required to determine if these are present here.

[3] http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/engagement/140312

Guideline 2b The Area of Search contains features with naturally high biodiversity (for habitats only)	
GD	The Nationally Important Marine Features survey (Goodwin *et al.,* 2011a) indicated that 60% (n=530) of the species listed for Northern Ireland's coastal waters were recorded in Rathlin's subtidal waters. Over 80 Priority Marine Features (PMFs) are located within the Rathlin AoS. Many of these species are found on GD features such as the cup coral *Caryophyllia inornata* (this is only recorded on the Ruecallan submerged archway). Other PMFs found on GD features include: the soft coral *Alcyonium hibernicum*, cup coral *Caryophyllia smithii* and anemones including *Parazoanthus axinellae* and *Parazoanthus anguicomus*. PMFs within the AoS include Maerl beds and Seagrass beds within Church Bay, the area identified as important for BGs.
2b Result	**Guideline met.**

Guideline 2c The Area of Search contains coherent features not smaller fragmented ones	
DSB	As previously mentioned the AoS encompasses the only known location of this broad scale habitat within NI coastal waters. Predictive seabed habitat mapping[4] (McBreen *et al.,* 2011) identified the area of DSB and this was confirmed by camera and grab surveys, combined with JIBS data which covered part of the AoS (AFBI, 2015).
GD	The AoS also encompasses the known locations of GD features proposed for protection. Many of the GD features were identified as part of dive surveys tasked with recording biodiversity since the mid 1980s (Erwin *et al.,* 1986; Goodwin *et al.,* 2011b). More recently, these features have been identified and mapped from high resolution bathymetric data[5] and verified where depth allowed by dive survey (Goodwin *et al.,* 2011a,b). These features are generally found close to shore along the north coast of Rathlin Island.
2c Result	**Guidelines met.**

Guideline 2d The Area of Search contains features considered least damaged/more natural	
DSB	VMS (Vessel Monitoring System) data from fishing vessels (primarily scallop dredging) during 2009 – 2013 showed low fishing intensity, over the DSB area to the north west of Rathlin (refer to Rathlin Conservation Objectives and Potential Management Options for further details). Until recently VMS was only required on vessels over 15m; this now applies to vessels over 12m. However, the location, depth and exposed prevailing conditions are unlikely to attract smaller vessels to fish here. There was no evidence of damage to the seabed in the video footage recorded in 2014

[4] EMODnet. EUSeaMap: A broad-scale physical habitat map for European Seas.

[5] Archaeological applications of the Joint Irish Bathymetric Survey (JIBS) data. http://www.heritagecouncil.ie/fileadmin/user_upload/INSTAR_Database/Archaeological_Applications_of_JIBS_Data_Progress_Report_08.pdf

Guideline 2d	The Area of Search contains features considered least damaged/more natural
	and 2015. The presence of species, such as the peacock worm (*Sabella pavonina)* and the Dahlia anemone (*Urticina* species) found at every site indicates that these areas have not been recently impacted by demersal fishing gear. Although the DSB falls within a busy shipping area, it is unlikely to be affected as these vessels are transiting through and, due to the depth and exposure, are unlikely to anchor in this area. The most recent survey showed no evidence of damage from human activity suggesting it is likely to be in near natural condition. This is most likely due to its location, depth and exposure to strong tidal conditions.
GD	The components of the GD features, that is, features indicating past change in relative sea level, were formed during multiple ice age events. The current presence, longevity, size and location of these features where they are unlikely to be impacted/damaged by anthropogenic activity suggest a natural state within the AoS.
BG	BG numbers on Rathlin have fluctuated over the years since standard methods of counts were first introduced in 1999. The population rose from 203 (individuals) in 1999 to 227 in 2003, but then went into decline falling to a low of 28 in 2011. Since then the population increased to 129 in 2013 but recent counts show that the population is now in decline with the count for 2015 at 98[6] (Figure 1). It is uncertain what is causing this fluctuation in population however a recent report on NI seabirds (Leonard & Wolsey, 2014) noted that the BG population has decreased in northern sites, while southern sites have shown a significant rise suggesting a redistribution of population within NI waters. Further investigation is needed to confirm this and to determine if this is the case for Rathlin.
2d Result	**Guidelines partially met. BG is not considered natural/least damaged.**

[6] RSPB from JNCC Seabird Monitoring Programme (SMP) database

Guideline 2e The Area of Search contains features at risk[7] of damage by human activity	
DSB	On the basis of the risk assessment (Annex A), undertaken at a local level of the Rathlin AoS, DSB is considered to be at moderate risk of significant damage associated with anthropogenic activities. This feature is sensitive to pressures such as physical change, species removal and sub-surface abrasion from demersal fishing using mobile gear (e.g. trawling and dredging). The degree of sensitivity will depend on the seabed substrate and the associated species. This relationship can be complicated as some habitats (e.g. bedrock) may be less sensitive than others (mud) but their associated species (cold water corals) may be more sensitive to the effects of trawling and dredging. As such, the risk of not achieving the conservation objectives for DSB is moderate to high without active management of mobile gear fishing in place. This feature is considered to be at **low to moderate** risk of significant damage associated with anthropogenic activities. This is a result of potential exposure to pressures associated with fishing activity, specifically the use of mobile gear which can cause physical changes, species removal and surface and sub-surface abrasion of the DSB. Mooring and anchoring, tourism and recreation are all thought to pose a low risk due to the depth of the feature and distance from land.
GD	GD features are considered to be at **low** risk of damage associated with current activities occurring in the area.
BG	This feature is considered **moderate** to **high** risk of damage associated with anthropogenic activities occurring in the area.
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.**

[7] Information on the sensitivity of the proposed biodiversity protected features to pressures and their associated activities was taken from Tillin *et al*. (2010), FEAST (Feature Activity Sensitivity Tool) http://www.marine.scotland.gov.uk/FEAST/Index.aspx and more developed sensitivity matrices by JNCC. The degree to which a feature is exposed to activities associated with pressures to which it is sensitive in each AoS/pMCZ 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 by pMCZ region. The conclusions may not reflect the level of risk at the level of the possible pMCZ. The sensitivity of the proposed geodiversity protected features to pressures and their associated activities was taken from Brooks (2009) and an assessment of risk was undertaken at the national level.
More detailed information on the process can be found on the papers: Guidance on the development of Conservation Objectives and potential Management Options and Conservation Objectives and potential Management Options for Rathlin pMCZ. The risk assessment for Rathlin pMCZ is included in Annex A.

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 AoS size is considered sufficient for maintaining the integrity of the three pMCZ features to be protected. The pMCZ boundary contains over 94% of the DSB habitat located in NI coastal waters. The GD features identified around Rathlin all fall within the proposed boundary. The boundary was extended to the south to ensure that the BG had sufficient depth (>50m) and range (2 km from nests) for breeding birds to forage and feed.
	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 MCZ is being considered. Account should also be taken where relevant, of the need for effective management of relevant activities	
DSB	The AoS has been extended to cover all three features (DSB, GD and BG; refer to Stage 1). The extent of the DSB was initially identified from predictive habitat mapping (McBreen *et al.* 2011)[4]. AFBI, on behalf of the Department, carried out a survey (2014 and 2015) which provided a detailed description of the benthic community, confirming the presence of subtidal sands, mixed sediment and rock. Further work is needed to describe the seabed to the north of the boundary. The proposed boundary currently encompasses approximately 94% of the DSB in this area and was drawn following the Guidance on selection and designation of MCZs in the Northern Ireland inshore Region. The boundary was drawn with the minimum number of lines to be meaningful to stakeholders involved in managing activities in this area.
GD	The pMCZ boundary encompasses a number of Rathlins GD features, most occurring within 300m of the Rathlin Island coastline. The paleo-lagoon, discovered and mapped as part of a high resolution bathymetric survey carried out along the North coast[8], is the furthest GD feature from the shore, approximately 1.2km from the north east corner of Rathlin, and is still well within the proposed boundary. It is thought that these features would have marked the outer extent of Rathlin before the ice age. The GD features all fall within the SAC which will be subject to a ban on the use of mobile fishing gear removing any likely pressures likely to pose a risk to this pMCZ feature.
BG	The southern boundary follows the existing SAC and was extended to ensure that the depth and range recommended for feeding and foraging BG in Church Bay were accommodated within the pMCZ boundary.

[8] http://www.heritagecouncil.ie/fileadmin/user_upload/INSTAR_Database/Archaeological_Applications_of_JIBS_Data_Progress_Report_08.pdf

Stage 4 - Assess the effectiveness of managing features within the proposed Area of Search

Summary of assessment	There is potential for management measures to be implemented successfully to achieve the conservation objectives of the pMCZ features.
	Guideline met. As a result the original AoS and subsequent pMCZ progresses as potential area for MCZ 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 MPA
The conservation objectives for two of Rathlin's pMCZ features, DSB and GD, are to '*maintain the features in favourable condition*'. The evidence gathered to date suggests that both features are considered to be in favourable condition with no evidence of impact from anthropogenic activities in the area. However these features could potentially be adversely affected by current or future activities which need to be considered when deciding whether additional management is needed to meet the conservation objective. There has been a notable decline in the BG population on Rathlin Island and as such the Department has set the conservation objective to '*recover the feature to favourable condition*'. Further work is necessary to investigate the decline in numbers of BG. Management measures may be put into place to mitigate against pressures which impact this species during breeding season A range of management options have been suggested in the Conservation Objectives and Potential Management Options for Rathlin pMCZ paper, to address likely pressures from anthropogenic activities on the pMCZ features.

Stage 5 - Assess the ecological coherence to prioritise between different areas based on the contribution to the MPA network

Summary of assessment	This is the only pMCZ put forward for Northern Ireland for DSB, GD and BG so the site contributes significantly to the MPA network.
	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
Deep–sea bed	The AoS contains the only known location of DSB in Northern Ireland coastal waters. This broadscale habitat contains offshore mixed sediment interspersed with deep circalittoral rock/reef. The depth and location of this broad scale habitat, where the Atlantic meets the Irish Sea, means the area is exposed to strong tidal currents and is relatively undisturbed by human activity .	While there is no replication of this feature within NI coastal waters, offshore mixed sediment which was identified as a component of the DSB is also present and protected in the Clyde Sea Sill within the Scottish Nature Conservation Marine Protected Areas (NC MPAs).	The total area of DSB, calculated from predicted habitat maps[4] within NI coastal waters, is 47km^2. Over 94% of this will be protected within the pMCZ boundary.
	Viability	**Connectivity**	**Management**
	The precautionary approach has been applied as there is no information for the size of area required to protect this habitat and the features associated with it. In addition it was not possible to survey the entire area and there may be features such as cold water coral yet to be discovered. It was	The species associated with this feature have a degree of connectivity at the UK MPA network level with similar habitats in offshore areas located to the west and north of Scottish inshore and offshore waters.	There is potential for management measures to be implemented successfully to achieve the conservation objectives of the pMCZ feature such as fisheries measures, licensing activities and through bye-laws.

	therefore deemed appropriate to include a significant proportion 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 Data confidence assessment for Rathlin pMCZ for further details.	For further details refer to Conservation Objectives and potential Management Options for Rathlin pMCZ paper and Regulatory Impact Assessment (RIA).	

Feature	Representation	Replication	Adequacy
Black guillemot	The Rathlin population of BG had over 14% (129) of the total numbers for Northern Ireland recorded in 2013. Runkerry, the nearest site (approx 13km away) reported only 30 birds for the same period. The cliffs along Rathlins coast and the man-made structures at the sheltered harbour in Church Bay, are thought to provide important nesting sites.	There are no other sites proposed for BG in NI but there are 6 Nature Conservation Marine Protected Areas which list BG as a protected feature in Scotland where the species dominates. The closest of these NC MPAs is the Clyde Sea Sill which lies less than 25km away from Rathlin.	The Scottish report (Marine Scotland & SNH, 2012) recommended that the seaward boundary for BG is at least 1km to encompass most birds foraging along the coastline while 2km would encompass >95% of the population. Depth of water was also considered as the BG do not tend to forage in waters deeper than 50m. With this in mind, the seaward boundary was extended to include waters up to 50m out to 2km from the nesting sites.
	Viability	**Connectivity**	**Management**
	Scotland carried out an extensive review when designating NC MPAs for BG and suggested that the AoS should contain at least 1% of the GB population. The all Ireland population (including NI) reported counts of 4,541 (2004). Based on this count, Rathlin's population (2013) was almost 3% of the all Ireland population so falls well within the recommended viability parameters	The BG is a circumpolar species which in the UK has historically been a predominantly Scottish species (88% of the British and Irish population) with NI accounting for approximately 3% (Mitchell *et al*., 2004). While Rathlin is the only MCZ designated for BG in Northern Ireland, the close proximity to Scottish NC MPAs protecting BG colonies such as the Clyde Sea Sill,	There is potential for management measures to be implemented successfully to achieve the conservation objectives of the pMCZ features such as fisheries measures, licensing activities and though bye-laws.

	suggested in Scottish report (Marine Scotland & SNH, 2012).	(>25km) ensures that there is connectivity between BG colonies (Marine Scotland & SNH, 2012).	
	Best available evidence	**Economic, cultural and social issues**	
	Best available evidence has been used at the time. Refer to Data confidence assessment for Rathlin pMCZ for further details.	For further details refer to Rathlin Conservation Objectives and potential Management Options paper and RIA.	
Geodiversity Features (GD)	**Representation**	**Replication**	**Adequacy**
Features indicating past change in relative sea level, including submerged sea cliff, archway and gullies.	The GD features proposed for Rathlin are excellent examples of features resulting from the retreat of ice sheets during multiple ice age events.	While there is no replication of these features within NI at present they are thought to occur in other MPAs. Further work is needed to identify and map the location, condition and extent of similar GD features in existing MPAs.	The GD features identified around Rathlin all fall well within the pMCZ boundary to the North which was set to accommodate DSB feature.
	Viability	**Connectivity**	**Management**
	The features appear intact and relatively undisturbed, indicated by the diverse flora and fauna which cover the features.	Not applicable	There is potential for management measures to be implemented successfully to achieve the conservation objectives of the pMCZ feature such as fisheries measures, licensing activities

			and through bye-laws.
	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 Data confidence assessment for Rathlin pMCZ for further details.	For further details refer to Conservation Objectives and potential Management Options for Rathlin pMCZ paper and RIA.	

Data Sources and Bibliography

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Annex A

Sensitivity, exposure and vulnerability Matrix for Rathlin Island pMCZ

Sensitivity and Exposure Key: ●●● High ●● Moderate ● Low ○ Not sensitive ?No information

Vulnerability Key: High vulnerability Moderate vulnerability Low vulnerability No vulnerability Unknown

Table 1: Deep-sea bed Vulnerability Assessment

Pressure category	Pressures	Activities associated in the area	Deep-sea bed		
			Sensitivity	Exposure	Vulnerability
Physical Loss	**Physical loss**			○	**No Vulnerability**
	Physical change (to another seabed type)	Extraction oil and gas-	●●●	●●	**High Vulnerability**
Physical Damage	**Siltation rate changes (low)**	Fishing – benthic trawling	●●●	●	**Moderate Vulnerability**
	Siltation rate changes (high)	Fishing – benthic trawling	●●●	●	**Moderate Vulnerability**
	Sub-surface abrasion/penetration: damage to seabed surface and penetration ≤25mm	Fishing – scallop dredging	●●●	●	**Moderate Vulnerability**
		Energy production - Tidal turbine energy production		○	**No Vulnerability**
		Marine traffic - Moorings, anchoring & navigation		●	**Moderate Vulnerability**
		Tourism & recreation		●	**Moderate Vulnerability**
	Surface abrasion: damage to seabed surface features	Fishing – scallop dredging	●●●	●	**Moderate Vulnerability**
		Marine traffic - Moorings, anchoring & navigation		●	**Moderate Vulnerability**

		Tourism & recreation		●	**Moderate Vulnerability**
	Physical removal (extraction of substratum)	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	●●●	○	**No Vulnerability**
	Barrier to species movement (behaviour, reproduction)		○		**No Vulnerability**
	Death or injury by collision		○		**No Vulnerability**
Non-physical disturbance & Climate change	**Litter**		?		**Unknown**
	Introduction of light		?		**Unknown**
	Electromagnetic changes		?		**Unknown**
	Underwater noise		○		**No Vulnerability**
	Visual disturbance (behaviour)		?		**Unknown**
	Temperature changes - regional/national		?		**Unknown**
	Temperature changes - local	Energy Production	●●	○	**No Vulnerability**
	Atmospheric climate change		○		**No Vulnerability**
	Emergence regime changes (sea level) - regional/national		○		**No Vulnerability**
	Emergence regime changes - local		○		**No Vulnerability**
	Water flow (tidal & ocean current) changes - regional/national	Marine traffic- Shipping	●●●	○	**No Vulnerability**

	Wave exposure changes - regional/national		○		**No Vulnerability**
	Water flow (tidal current) changes - local		○		**No Vulnerability**
	Wave exposure changes - local		○		**No Vulnerability**
Toxic Contamination	**Introduction of other substances (solid, liquid or gas)**		?		**Unknown**
	Non-synthetic compound contamination (inc. heavy metals, hydrocarbons, produced water)		○		**No Vulnerability**
	Synthetic compound contamination (inc. pesticides, antifoulants, pharmaceuticals)		○		**No Vulnerability**
	Radionuclide contamination		○		**No Vulnerability**
Non-toxic Contamination	**Organic enrichment**		○		**No Vulnerability**
	Salinity changes - local		○		**No Vulnerability**
	Salinity changes - regional/national		○		**No Vulnerability**
	pH changes		?		**Unknown**
	De-oxygenation		○		**No Vulnerability**
	Nitrogen & phosphorus enrichment		○		**No Vulnerability**
	Water clarity changes		○		**No Vulnerability**
Biological Disturbance	**Removal of target species (lethal)**	Fishing – scallop dredging,	●●●	●	**Moderate Vulnerability**

		benthic & pelagic trawling, recreational fishing			
	Removal of non-target species (lethal)	Fishing – scallop dredging, benthic & pelagic trawling, recreational fishing	●●●	●	**Moderate Vulnerability**
	Genetic modification & translocation of indigenous species		○		**No Vulnerability**
	Introduction of microbial pathogens (disease)		○		**No Vulnerability**
	Introduction or spread of non-indigenous species & translocations (competition)	Marine traffic-Shipping, Recreational boating	●●	●	**Moderate Vulnerability**

Table 2: Black guillemot Vulnerability Assessment

Pressure category	Pressures	Activities associated in the area	Black guillemot		
			Sensitivity	Exposure	Vulnerability
Physical Loss	**Physical loss**		?		**Unknown**
	Physical change (to another seabed type)	Fishing- pelagic trawl	●	●	**Low Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
		Aquaculture		●	**Low Vulnerability**
		Infrastructure - ports, marinas, leisure facilities, cables , coastal defence		●●	**Moderate Vulnerability**
		Energy production - Tidal turbine energy production		○	**No Vulnerability**
Physical Damage	**Siltation rate changes (low)**		○		**No Vulnerability**
	Siltation rate changes (high)		○		**No Vulnerability**
	Sub-surface abrasion/penetration: damage to seabed surface and penetration ≤25mm		○		**No Vulnerability**
	Physical removal (extraction of substratum)	Infrastructure - ports, marinas, leisure facilities, cables	●	●●	**Moderate Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
	Barrier to species movement	Energy production - Tidal	●●	○	**No**

	(behaviour, reproduction)	turbine energy production			**Vulnerability**
		Aquaculture		●●	**Moderate Vulnerability**
		Infrastructure - ports, marinas, leisure facilities		●●	**Moderate Vulnerability**
	Death or injury by collision	Tourism & recreation		●●●	**Moderate Vulnerability**
		Marine traffic- Ferry route, shipping		●●●	**Moderate Vulnerability**
		Infrastructure - ports, marinas, leisure facilities, cables		●●	**Moderate Vulnerability**
		Aquaculture		●●	**Moderate Vulnerability**
		Discharges/dredge disposal	●●	●	**Low Vulnerability**
		Energy production - Tidal turbine energy production.		○	**No Vulnerability**
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing		●●	**Moderate Vulnerability**
Non-physical disturbance & Climate change	**Litter**		?		**Unknown**
	Introduction of light		?		**Unknown**
	Electromagnetic changes		○		**No Vulnerability**
	Underwater noise	Tourism and Recreation	●●	●●	**Moderate Vulnerability**
		Infrastructure - ports, marinas, leisure facilities,		●●	**Moderate Vulnerability**

		cables			
		Marine traffic- Shipping, Recreational boating		●●	**Moderate Vulnerability**
		Energy production - Tidal turbine energy production.		○	**No Vulnerability**
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing		●●	**Moderate Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
	Visual disturbance (behaviour)	Tourism and Recreation	●●	●●	**Moderate Vulnerability**
		Infrastructure - ports, marinas, leisure facilities, cables		●●	**Moderate Vulnerability**
		Marine traffic- Shipping, Recreational boating		●●	**Moderate Vulnerability**
		Energy production - Tidal turbine energy production.		○	**No Vulnerability**
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing		●●	**Moderate Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
	Temperature		?		**Unknown**

	changes - regional/national				
	Temperature changes - local		?		**Unknown**
	Atmospheric climate change		○		**No Vulnerability**
	Emergence regime changes (sea level) - regional/national		○		**No Vulnerability**
	Emergence regime changes - local		○		**No Vulnerability**
	Water flow (tidal & ocean current) changes - regional/national		○		**No Vulnerability**
	Wave exposure changes - regional/national		○		**No Vulnerability**
	Water flow (tidal current) changes - local	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	●	●●	**Low Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
		Energy production - Tidal turbine energy production		○	**No Vulnerability**
	Wave exposure changes - local	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	●	●●	**Low Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
		Energy production - Tidal		○	**No**

		turbine energy production			**Vulnerability**
Toxic Contamination	**Introduction of other substances (solid, liquid or gas)**		?		**Unknown**
	Non-synthetic compound contamination (inc. heavy metals, hydrocarbons, produced water)		○		**No Vulnerability**
	Synthetic compound contamination (inc. pesticides, antifoulants, pharmaceuticals)	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	●	●●	**Low Vulnerability**
		Discharges/dredge disposal		●	**Low Vulnerability**
		Energy production - Tidal turbine energy production		○	**No Vulnerability**
	Radionuclide contamination		○		**No Vulnerability**
Non-toxic Contamination	**Organic enrichment**		○		**No Vulnerability**
	Salinity changes - local		○		**No Vulnerability**
	Salinity changes - regional/national		○		**No Vulnerability**
	pH changes		?		**Unknown**
	De-oxygenation		○		**No Vulnerability**
	Nitrogen & phosphorus enrichment	Discharges/dredge disposal	●	●	**Low Vulnerability**
	Water clarity changes	Infrastructure - ports, marinas,	●	●●	**Low vulnerability**

		leisure facilities, cables , coastal defence & land claim			
		Discharges/dredge disposal		●	**Low vulnerability**
		Energy production - Tidal turbine energy production		○	**No Vulnerability**
Biological Disturbance	**Removal of non-target species (lethal)**	Fishing – scallop dredging, creeling & potting, recreational fishing, pelagic and demersal trawling	●●	●●	**Moderate Vulnerability**
		Tourism & recreation		●	**Low vulnerability**
		Aquaculture - seaweed harvesting		●	**Low vulnerability**
	Removal of target species (lethal)		○		**No Vulnerability**
	Genetic modification & translocation of indigenous species		?		**Unknown**
	Introduction of microbial pathogens (disease)		○		**No Vulnerability**
	Introduction/spread of non-indigenous spp.	Predation on nests in breeding season by ferrets, rats and cats [9]	●●●	●●●	**High Vulnerability**

[9] This was identified as high risk and a significant pressure by RSPB in NI and western coast of Scotland (SNH, 2012) http://www.scotland.gov.uk/Resource/0038/00389462.doc

Risk of Damage Assessment for Rathlin pMCZ

Risk Key: High risk Moderate risk Low risk

Table 3: Deep-sea bed Risk of Damage Matrix (based on Vulnerability identified in Table 1)

Deep-sea bed							
List of pressures which may cause deterioration or disturbance		**Activity associated with pressure**	**Vulnerability**	**Current Management adequate?**	**Comments**	**Level of Risk**	**Action Advised**
Physical loss	**Physical change (to another seabed type)**	Extraction oil and gas	**High Vulnerability**	No	There is currently a license issued for oil and gas exploration which encompasses the pMCZ and any activity may adversely impact the features of the site.	**High**	- A liaison group between the Department, DECC and DETINI is required to ensure appropriate management is put into place.
Physical damage	**Siltation rate changes (high & low)**	Fishing – benthic trawling	**Moderate Vulnerability**	No	While there is no site specific management of this activity over the DSB feature, the VMS data suggests that fishing activity is low. In addition the strong tidal conditions to which	**Moderate**	- Reduce or limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the

					this area is exposed means that the risk from this pressure is low.		pMCZ
	Sub-surface abrasion/penetration: damage to seabed surface and penetration ≤25mm	Fishing – scallop dredging	**Moderate Vulnerability**	No	While there is no site specific management of this activity over the DSB feature, the VMS data suggests that fishing activity is low. In addition the strong tidal conditions to which this area is exposed means that the risk from this pressure is low.	**Moderate**	- Reduce or limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
		Marine traffic – moorings and anchoring	**Moderate Vulnerability**	No	The depth (>200m) and location of the DSB feature means it is at low risk of physical damage from pressures associated with marine traffic transiting through this area.	**Low**	- No action required at present
		Tourism & recreation	**Moderate Vulnerability**	No	The location and depth of the DSB	**Low**	- No action required at

					feature mean it is unlikely to be at risk from pressures associated with tourism and recreation		present
	Surface abrasion: damage to seabed surface features	Fishing – scallop dredging	**Moderate Vulnerability**	No	While there is no site specific management of this activity over the DSB feature, the VMS data suggests that fishing activity is low.	**Moderate**	- Reduce or limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
		Marine traffic –moorings, anchoring & navigation	**Moderate Vulnerability**	No	The depth (>200m) and location of the DSB feature means it is at low risk of physical damage from pressures associated with marine traffic transiting through this area	**Low**	- No action required at present
		Tourism & recreation	**Moderate Vulnerability**	No	The location and depth of the DSB feature mean it is unlikely to be at risk	**Low**	- No action required at present

					from pressures associated with tourism and recreation		
Biological disturbance	**Removal of target species (lethal)**	Fishing – scallop dredging, benthic & pelagic trawling, recreational fishing	**Moderate Vulnerability**	No	While there is no site specific management of this activity over the DSB feature, the VMS data suggests that fishing activity is low.	**Moderate**	- Reduce or limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
	Removal of non target species (lethal)	Fishing– scallop dredging, benthic & pelagic trawling, recreational fishing	**Moderate Vulnerability**	No	While there is no site specific management of this activity over the DSB feature, the VMS data suggests that fishing activity is low.	**Moderate**	- Reduce or limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ

	Introduction or spread of non-indigenous species & translocations (competition)	Marine traffic- Shipping and recreational boating	**Moderate Vulnerability**	No	Due to the strong tidal currents, depth (>200m) and transitory nature of vessels moving through the area of DSB the risks associated with this pressure are considered to be low.	**Low**	- No action required at present

Table 4: Black guillemot (BG) Risk of Damage Matrix (based on Vulnerability identified in Table 2)

Risk Key: High risk Moderate risk Low risk

Black guillemot							
List of pressures which may cause deterioration or disturbance		**Activity associated with pressure**	**Vulnerability**	**Current Management adequate?**	**Comments**	**Level of Risk**	**Action Advised**
Physical Loss	**Physical change (to another seabed type)**	Fishing – pelagic trawl	**Low Vulnerability**	Yes	DARD are in the process of introducing a ban on mobile gear within the SAC which covers most of the foraging area for BG. There is a voluntary ban on the use of mobile gear within the SAC at the moment which is being adhered to by local fishermen.	**Low**	- Reduce and limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments require future	**Low**	- Reduce or limit new waste water discharges and dredge

					management action (licensing/permits).		disposal and expansion or relocation of existing disposal activities
		Infrastructure – ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	New developments require future management action (licensing/permits) if they are likely to impact on the pMCZ features.	**Moderate**	- Consider impact of new developments on BG feeding and foraging areas within the pMCZ boundary
Physical Damage	**Physical removal (extraction of substratum)**	Infrastructure – ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	New developments require future management action (licensing/permits) if they are likely to impact on the pMCZ features.	**Moderate**	- Consider impact of new development on BG feeding and foraging areas within the pMCZ boundary
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments require future management action	**Low**	- No action required at present

					(licensing/permits).		
	Barrier to species movement (behaviour, reproduction)	Aquaculture	**Moderate Vulnerability**	Yes	New developments, expansion or relocation of the existing aquaculture facility require future management action (licensing/permits).	**Low**	- No action required at present
		Infrastructure – ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future management action (licensing/permits).	**Low**	- No action required at present
	Death or injury by collision	Tourism & recreation	**High Vulnerability**	No	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed	**Moderate**	- Introduction of speed restriction zone during the BG breeding season

					where BG foraging or feeding during breeding season.		
		Marine Traffic- Ferry route, shipping	**High Vulnerability**	No	Any changes in routes that would increase marine traffic through the BG feeding and foraging area require future management action.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Infrastructure - ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future management action.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Aquaculture	**Moderate Vulnerability**	No	Boats servicing the aquaculture site may increase the risk of death or injury by collision.	**Moderate**	- Reduce or limit activities associated with existing aquaculture inside the pMCZ - Remove or

							avoid activities associated with expansion or relocation of new aquaculture sites inside the pMCZ Introduction of speed restriction zone during the BG breeding season.
		Discharges/dredge disposal	**Moderate Vulnerability**	yes	At present the disposal site lies outside the pMCZ. New developments require future management action (licensing/permits).	**Low**	- No action required at present
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing	**Moderate Vulnerability**	Yes	DARD are in the process of introducing a ban on mobile gear within the SAC which covers most	**Moderate**	- Reduce and limit static gear fishing inside the pMCZ - Remove or

					of the foraging area for BG. There is a voluntary ban on the use of mobile gear within the SAC at the moment which is being adhered to by local fishermen.		avoid mobile gear fishing inside the pMCZ
Non-physical disturbance & Climate change	**Underwater noise**	Tourism and recreation	**Moderate Vulnerability**	No	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during breeding season.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Infrastructure - ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during	**Moderate**	- Introduction of speed restriction zone during the BG breeding season

					breeding season.		
		Marine traffic-shipping, recreational boating	**Moderate Vulnerability**	No	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during breeding season.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing	**Moderate Vulnerability**	Yes	DARD are in the process of introducing a ban on mobile gear within the SAC which covers most of the foraging area for BG. There is a voluntary ban on the use of mobile gear within the SAC at the moment which is being adhered to by local fishermen.	**Moderate**	- Reduce and limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
		Discharges/dredge	**Low**	Yes	At present the disposal site lies	**Low**	- No action required at

		disposal	**Vulnerability**		outside the pMCZ. New developments require future management action (licensing/permits).		present
	Visual disturbance (behaviour)	Tourism and Recreation	**Moderate Vulnerability**	No	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during breeding season.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Infrastructure - ports, marinas, leisure facilities, cables	**Moderate Vulnerability**	Yes	Consider informing tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during breeding season.	**Moderate**	- Introduction of speed restriction zone during the BG breeding season
		Marine traffic-	**Moderate**	No	Consider informing	**Moderate**	- Introduction

		shipping, recreational boating	**Vulnerability**		tourists (through information panels at Ballycastle and Rathlin Harbours) explaining importance of reducing speed where BG foraging or feeding during breeding season.		of speed restriction zone during the BG breeding season
		Fishing – creeling and potting, pelagic and demersal trawling, recreational fishing	**Moderate Vulnerability**	Yes	DARD are in the process of introducing a ban on mobile gear within the SAC which covers most of the foraging area for BG. There is a voluntary ban on the use of mobile gear within the SAC at the moment which is being adhered to by local fishermen.	**Moderate**	- Reduce and limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments	**Low**	- No action required at present

					require future management action (licensing/permits).		
	Water flow (tidal current) changes - local	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	**Low Vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future management action (licensing/permits).	**Low**	- No action required at present
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments require future management action (licensing/permits).	**Low**	- No action required at present
	Wave exposure changes - local	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	**Low Vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future	**Low**	- No action required at present

					management action (licensing/permits).		
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments require future management action (licensing/permits).	**Low**	- No action required at present
Toxic Contamination	**Synthetic compound contamination (inc. pesticides, antifoulants, pharmaceuticals)**	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	**Low Vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future management action (licensing/permits).	**Low**	- No action required at present
		Discharges/dredge disposal	**Low Vulnerability**	Yes	At present the disposal site lies outside the pMCZ. New developments require future management action	**Low**	- No action required at present

					(licensing/permits).		
Non-toxic Contamination	**Nitrogen & phosphorus enrichment**	Discharges/dredge disposal	**Low vulnerability**	Yes	DOE discharge consent granted by the Department for Waste Water Discharge which was upgraded in 2013. At present the disposal site lies outside the pMCZ. New developments require future management action (licensing/permits).	**Low**	- No action required at present
	Water clarity changes	Infrastructure - ports, marinas, leisure facilities, cables , coastal defence & land claim	**Low vulnerability**	Yes	New developments, expansion or relocation of the existing infrastructure require future management action (licensing/permits).	**Low**	- No action required at present
		Discharges/dredge	**Low**	Yes	DOE discharge	**Low**	- No action

		disposal	**vulnerability**		consent granted by Department for Waste Water Discharge which was upgraded in 2013. At present the disposal site lies outside the pMCZ. New developments require future management action (licensing/permits).		required at present
Biological disturbance	**Removal of non-target species (lethal)**	Fishing – scallop dredging, creeling & potting, recreational fishing, pelagic and demersal trawling	**Moderate Vulnerability**	Yes	DARD are in the process of introducing a ban on mobile gear within the SAC which covers most of the foraging area for BG. There is a voluntary ban on the use of mobile gear within the SAC at the moment which is being adhered to by local fishermen.	**Moderate**	- Reduce and limit static gear fishing inside the pMCZ - Remove or avoid mobile gear fishing inside the pMCZ

		Tourism & recreation	**Low vulnerability**	No	No site specific measures in place	**Low**	- No action required at present
		Aquaculture	**Low vulnerability**	Yes	No site specific measures in place	**Low**	- No action required at present
	Introduction/spread of non-indigenous spp.	Predation on nests in breeding season by ferrets, rats and cats.	**High Vulnerability**	No	Under the Rathlin European Marine Site Management Scheme, predation eradication was identified as one of the measures needed to the reduce risk to birds protected under the SPA designation. This action is currently ongoing.	**High**	- Continue to remove introduced mammals identified as key predators and establish measures to avoid further introduction.

Geodiversity Features

The risk assessment for biological habitats and species is not appropriate for GD features. A report published by DEFRA (Brooks *et al.,* 2009) provided a feature vulnerability assessment which used a qualitative method to deliver a vulnerability score of either 'high', 'moderate', 'low' or 'none' for each feature to a list of anthropogenic activities taking place in the marine environment. These activities were categorised into three groups:

1. Activities/installations that remove or disturb the seabed (e.g. aggregate extraction);
2. Activities that dispose of material onto the seabed (e.g. dredge disposal waste), and
3. Installations that sit on the seabed (e.g. cables/pipeline).

The assessment took into account distance from feature and incorporated exposure and sensitivity to threats to determine vulnerability following established methods (Connor *et al.,* 2002). Eight activities and developments were assessed:

- Fishing (beam and dredge trawling)
- Aggregate extraction
- Hydrocarbons (Oil and Gas installations)
- Renewable Energy Developments
- Cables and Pipelines
- Navigational dredging
- Dredge waste disposal
- Military activity

When the vulnerability assessment was applied to the GD features for Rathlin they showed that the only feature which was at risk from the anthropogenic activities identified above was the paleo-lagoon. The paleo-lagoon was at **low** risk from potential renewable energy installations and dredge waste disposal but not vulnerable to the other six activities investigated. There are no energy installations in this area at the moment, and the Department would be consulted on any future installations within the pMCZ. There is a dredge disposal site to the south of Rathlin Island but it falls beyond the zone of influence and as the Island sits between it and the paleo-lagoon, it is not considered to be at risk.

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