



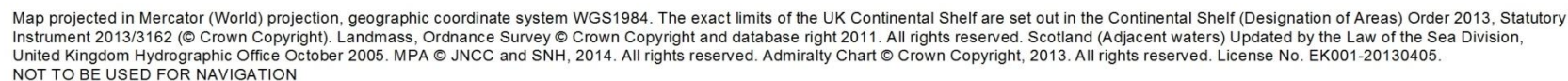
Scottish MPA Project Data Confidence Assessments
NORWEGIAN BOUNDARY SEDIMENT PLAIN NATURE CONSERVATION MPA
<i>JULY 2014</i>

The following documents provide further information about the Norwegian Boundary Sediment Plain Marine Protected Area (MPA):

- Site Summary Document
- Assessment against the MPA Selection Guidelines
- Management Options Paper

The documents are all available at www.jncc.defra.gov.uk/page-6485

Document Distribution List and Version Control				
Format	Version	Issue date	Version development and review	Issued to
Electronic	2.0	03/05/2013	Internal drafting and review of pre-version 2.0 drafts by JNCC SMPA team and Grade 7 staff and editorial review prior to release to MPA Sub Group	MPA Sub Group
Electronic	3.0	10/06/2013	Review of document to take into account MPA Sub-Group comments by JNCC SMPA team prior to release to MPA Sub Group for sign-off	MPA Sub Group
Electronic	4.0	19/07/2013	Review of document to take into account MPA Sub-Group comments by JNCC SMPA team and editorial review before release of document for public consultation.	Uploaded to JNCC website
Electronic	5.0	09/07/2014	Document update to align with designation status and text revised in response to consultation and independent review report	Delivery to Marine Scotland to support MPA designation and upload to website



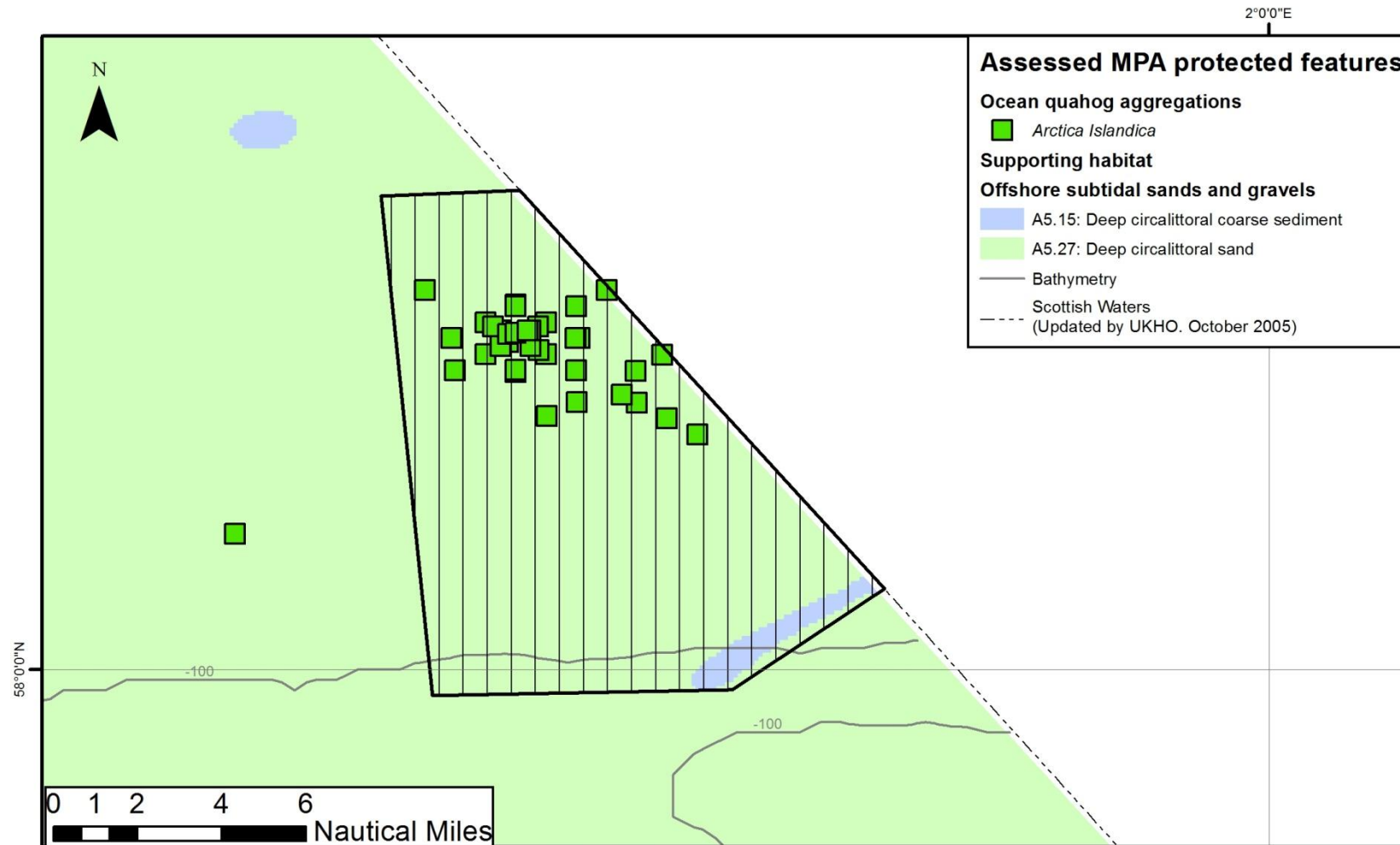
MPA name	Norwegian Boundary Sediment Plain	Date of initial assessment	16 th Aug 2012	Assessors	ALR, NC, PC, ML
<p>The area was selected following consideration of locations considered to be Least Damaged/More Natural (LD/MN) as detailed in Chaniotis <i>et al.</i> (2011). The boundary of the MPA was drawn to focus on the predicted extent of offshore subtidal sand and gravel habitats considered suitable for colonisation by ocean quahog (<i>Arctica islandica</i>) and also along the extent of a portion of the Norwegian Boundary Sediment Plain LD/MN location.</p>					

Protected features			
Biodiversity	Ocean quahog (<i>Arctica islandica</i>) aggregations (OQ) (including sands and gravels suitable for Ocean quahog colonisation)	Geodiversity	None
Feature exclusions (MPA search features recorded within the MPA but excluded from the assessment with reasons)			
None			

Data used in assessment			
Version of GeMS holding feature data used to support site selection	Ver.4	Other datasets used (not in GeMS) [superscripts are used to reference these datasets in the following discussion]	<ul style="list-style-type: none"> ¹British Geological Survey (BGS) Marine Particle Size Analysis (PSA) dataset (February 2012) - data collected between 1967 and 1987 categorised according to the Folk classification and subsequently to the EUNIS habitat classification by JNCC based on the BGS modified Folk scheme ²EuSeaMap habitat modelling project predicted habitat map (Cameron and Askew, 2011). Note that the product used in the maps is the 2012_08 version, which is an improvement on that published in the 2011 report

Summary of data confidence assessment (see detailed assessment on following pages)						
Confident in underpinning data		Yes	✓	Partial	-	No
Confident in presence of identified features?	OQ	Data suitable to define extent of individual protected features		Yes	Partial	No
				-	OQ	-
Summary	Multiple surveys conducted during the 1980s identified ocean quahog throughout the northern portion of the MPA. The species was also recorded in this part of the MPA during a survey in 1993. As ocean quahog are exceptionally long-lived (Ridgeway & Richardson, 2011), JNCC’s confidence in the presence of the species in the MPA is high, despite the age of the sample records, providing that the viability of the aggregation has not been compromised by disturbance in the intervening years. Our confidence is supported by the northern half of the MPA being considered an area likely to be least damaged/more natural (Chaniotis <i>et al.</i> , 2011) and therefore the ocean quahog population may not have been adversely impacted by anthropogenic pressures.					
	Our knowledge of the feature’s distribution in the area is constrained by the crucible survey design used by the offshore industry whose surveys generated the data of ocean quahog occurrence. The dataset provided did not include records where ocean quahog were not found. Consequently, such sample data can only be used as an indicator of feature presence and distribution rather than provide conclusive evidence of feature absence in other parts of the MPA.					
	Ocean quahog is recorded at significantly different densities across its range, with densities between 16-100m ² recorded in the northern North Sea (OSPAR, 2009). There is insufficient evidence available to quantify the density of the ocean quahog clustered records within the MPA, further data would be required to verify the feature density. Although ocean quahog is not characteristic of any particular habitat, they are known to occur in a range of sediments from coarse, clean, sand to muddy sand in the infralittoral, circalittoral, circalittoral offshore and bathybenthic offshore environment. They inhabit a water depth ranging from 4 to 400m (Witbaard & Bergman, 2003; Sabatini & Pizzolla, 2008). JNCC used British Geological Survey (BGS) Particle Size Analysis (PSA) data ¹ and EUSeaMap data (Cameron & Askew, 2011) to verify the presence of potentially suitable habitat for colonisation by ocean quahog aggregations as a proxy to define their actual presence and distribution, particularly in the southern part of the MPA area. Further survey would confirm the distribution and size of the ocean quahog population. It would also be beneficial to verify the feature presence given that most of the available evidence is over 20 years old.					

Figure 2 Map of the known distribution of protected features within the Norwegian Boundary Sediment Plain MPA



Data confidence assessment	JNCC's assessment of data confidence considered the age and source of the data, the type of sampling methodologies used and the overall coverage of data across the MPA (Maps A to C)
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Age of data (Map A)			
Multiple or majority of records collected post 2000	-	Multiple records collected pre 2000	✓
Comments	The majority of the ocean quahog records within this MPA were collected during surveys conducted between 1979 and 1993. The PSA data ¹ used to indicate suitable habitat for ocean quahog colonisation was collected between 1977 and 1982. The predictive habitat map, EUSeaMap, used to indicate extent of supporting habitat was developed in 2011 and updated in 2012 (Cameron & Askew, 2011)		

Source of data (Map B)					
Targeted data collection for nature conservation purposes	-	Statutory monitoring (marine licensing etc)	-	Fisheries survey work	-
Data collection associated with development proposals (EIA etc.)	✓	Recreational / volunteer data collection	-	Other (specify) – WEUSeaMap 2011, BGS data points	✓
Comments	The ocean quahog records originate from samples collected using benthic grab sampling techniques during oil and gas Environmental Impact Assessment (EIA) surveys, accessed from the UKOOA (UK Offshore Operators Association, now Oil & Gas UK) database. The PSA data ¹ came from sediment samples collected by British Geological Survey and used to indicate suitable habitat for ocean quahog colonisation. The predictive habitat map, EUSeaMap, used to indicate extent of supporting habitat is the result of work undertaken by a consortium lead by the JNCC to combine physical data describing the marine environment with information from biological sampling, generating a broad-scale habitat model of seabed habitats from which a predictive map was created (Cameron & Askew, 2011).				

Sampling methods / resolution							
Feature	Modelled	Acoustic / remote sensing	Remote video / camera	Infaunal - grab / core	Fisheries trawl	Diving	Sediment sampling
OQ	✓			✓			✓
Comments	The ocean quahog records were collected using benthic grab sampling techniques during oil and gas Environmental Impact assessment surveys. The British Geological Survey PSA data ¹ came from grab and core samples determining ground type that were collected using various methods. It is acknowledged that the spatial accuracy of older sample records may be limited in places where the Decca Main Chain or similar types of positioning systems would have been used. Sub-surface geological results from cores have not been reported here. The seabed habitat modelling project EUSeaMap predicted habitat map used in this assessment was developed by a consortium led by JNCC (Cameron & Askew, 2011).						

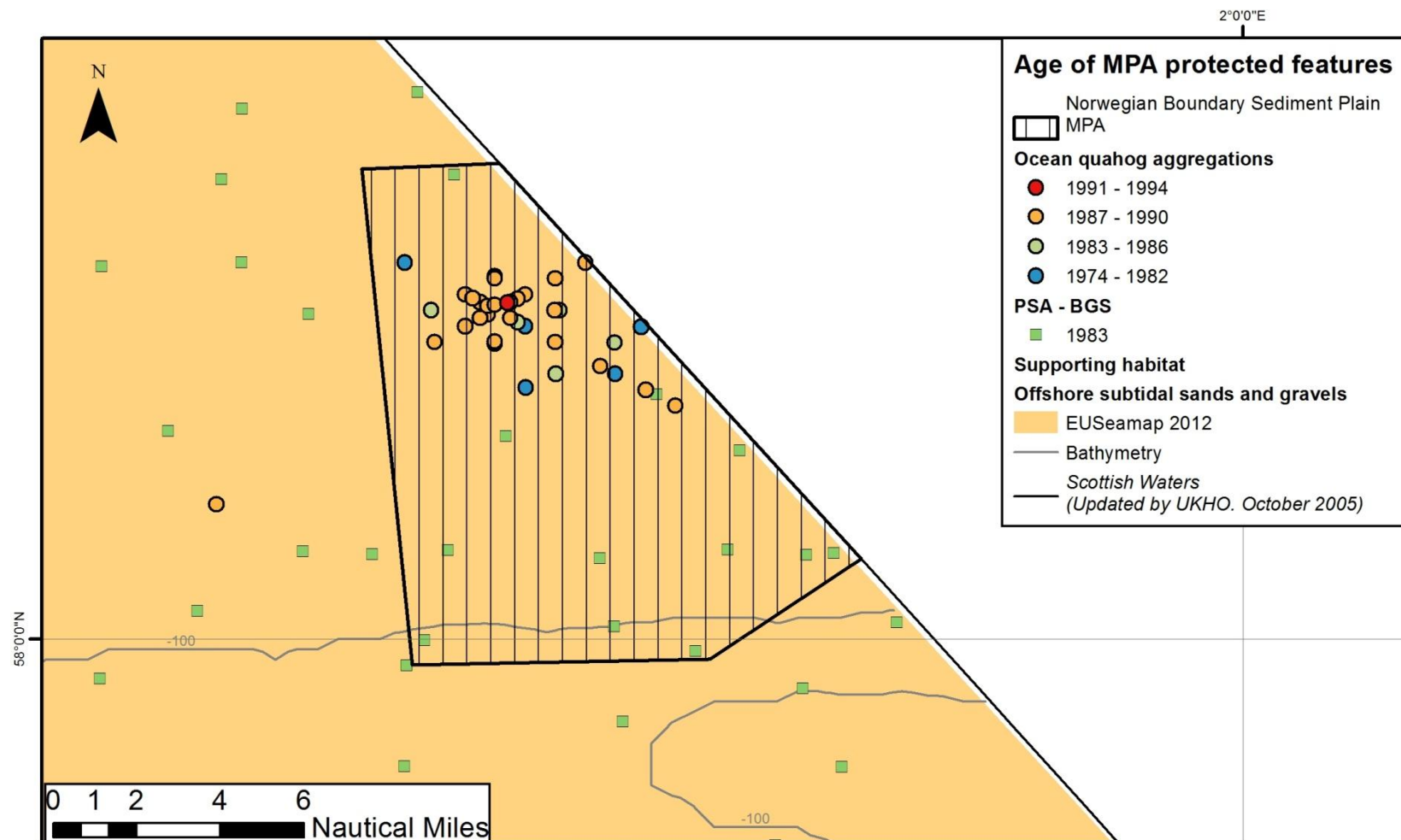
Data coverage (Maps A to C)					
Across the MPA					
Numerous protected feature records evenly distributed across the MPA?	-	Numerous protected feature records scattered across MPA with some clumping?	✓	Few or isolated protected feature records - possibly clumped?	-
For Individual features					
Multiple records of individual protected features providing indication of extent and distribution throughout MPA?	-	Few or scattered records of specific protected features making extent and broad distribution assessment difficult?	OQ	Few or isolated records of specific protected features	-
Are acoustic remote sensing data available to facilitate the development of a full coverage predictive seabed habitat map?			No		
Comments	Ocean quahog aggregations (<i>Arctica islandica</i>) (OQ) (species records)				
	<ul style="list-style-type: none">Clusters of ocean quahog records were found during benthic grab surveys conducted in the following surveys in the northern portion of the MPA. The status of the specimens (i.e. alive or dead at the point of sample collection, juvenile or adult) is not described. The determination of all the records is listed as certain.<ul style="list-style-type: none">1979, 1981, 1983 - OPRU (Oil Pollution Research Unit) - Maureen A Phillips (in GeMS v4) - There is one data entry from 1979, 15 data entries from 1981 and 16 from 1983 recording the presence of ocean quahog.1988 - AUMS (Aberdeen University Marine Studies Ltd) - Maureen A Phillips (in GeMS v4) - There are 22 data entries from 1988 recording the presence of ocean quahog.1993 - Gardline - Maureen A Phillips (in GeMS v4) - There is one data entry from 1993 recording the presence of ocean quahog.EUSeaMap, version 2012_08 (Cameron & Askew, 2011)² – The habitat map from a model predicts that suitable habitat for colonisation by Ocean quahog occurs throughout the MPA area. More specifically, the following habitats are predicted to be present: A5.15 Deep circalittoral				

Data coverage (Maps A to C)

coarse sediment and A5.27 Deep circalittoral sand (the dominant habitat type covering 97% of the MPA). These components are all considered suitable habitat type for ocean quahog colonisation (Witbaard & Bergman, 2003; Sabatini & Pizzolla, 2008).

- British Geological Survey (BGS) Marine Particle Size Analysis (PSA) dataset (February 2012) - These data represent sediment sampling between 1967 and 1987 across the UK waters in which the PSA results were categorised according to the Folk scheme and subsequently to EUNIS categories/BGS modified Folk classification. Note these data underpin the BGS substrate map used by the seabed habitat modelling project EUSeaMap. ¹ – Of the 12 sample records evenly distributed across the MPA, ten record the presence of sand and muddy sand and two record the presence of coarse sediment. Both types are considered suitable habitat type for ocean quahog colonisation (Witbaard & Bergman, 2003; Sabatini & Pizzolla, 2008).

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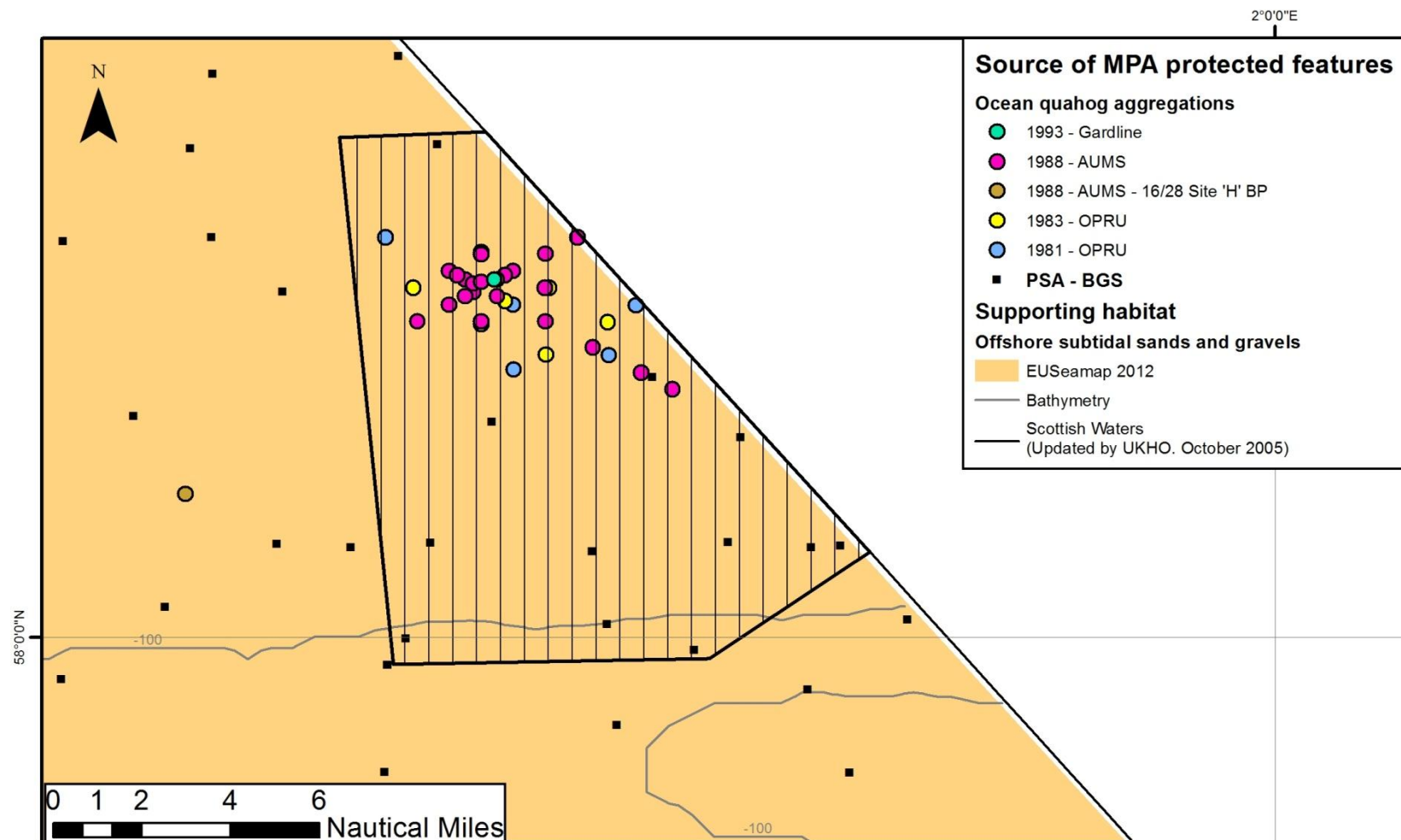
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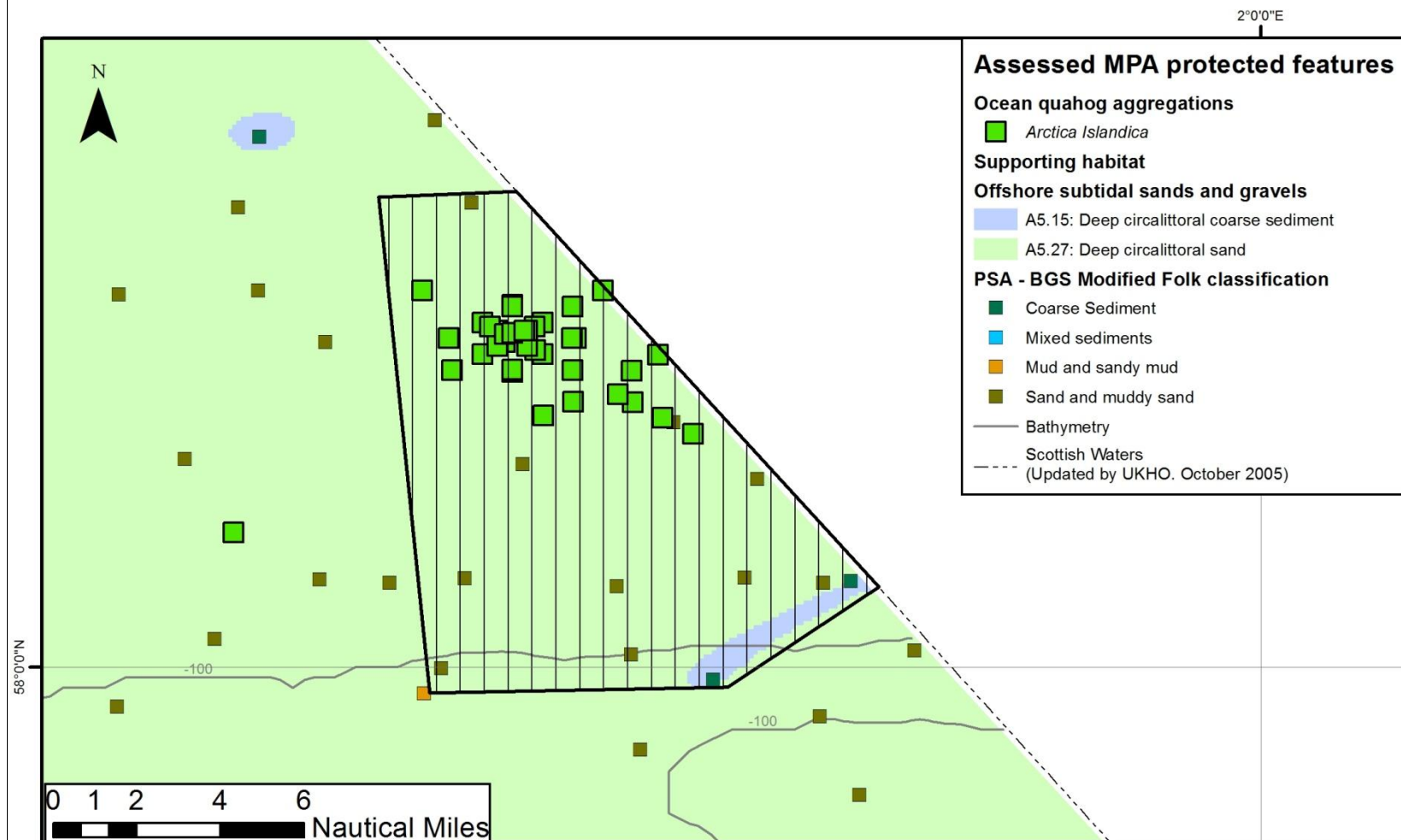
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Data sources and bibliography		
Year	Title	Features covered
2014	Geodatabase of Marine features in Scotland (GeMS) Version 4	OQ
2012	British Geological Survey (BGS) Marine Particle Size Analysis (PSA) dataset (February 2012)	-
2011	Chaniotis, P.D., Crawford-Avis, O.T., Cunningham, S., Gillham, K., Tobin, D. and Linwood, M.. (2011). Profiles of locations considered to be least damaged/more natural in Scotland's seas. Supplementary report produced by the Joint Nature Conservation Committee, Scottish Natural Heritage and Marine Scotland for the Scottish Marine Protected Areas Project. Available from < http://www.scotland.gov.uk/Resource/Doc/295194/0121829.pdf >	-
2011	Marine Scotland. (2011). Marine protected areas in Scotlands Seas: Guidelines on the selection of MPAs and the development of the MPA network. Available from < http://www.scotland.gov.uk/Resource/Doc/295194/0114024.pdf >	-
2011	Cameron, A. and Askew, N. (eds.). (2011). EUSeaMap - Preparatory Action for development and assessment of a European broad-scale seabed habitat map final report. Available at http://jncc.gov.uk/euseamap	OQ
2011	Ridgway, I.D. and Richardson, C.A..(2011), <i>Arctica islandica</i> : the longest lived non colonial animal known to science. <i>Reviews of Fish Biology and Fisheries</i> . 21(3):297-310	OQ
2008	Sabatini, M. and Pizzolla, P. (2008). <i>Arctica islandica</i> . Icelandic cyprine. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 07/06/2010]. Available from: http://www.marlin.ac.uk/speciesinformation.php?speciesID=2588	OQ
2003	Witbaard, R. and Bergman, M.J.N (2003). The distribution and population structure of the bivalve <i>Arctica islandica</i> L. In the North Sea: what possible factors are involved? <i>Journal of Sea Research</i> , 50 (1), 11-25.	OQ