

DATA CONFIDENCE ASSESSMENT

Carlingford Lough Proposed Marine Conservation Zone (pMCZ)

Sea-pen (*Virgularia mirabilis*) © Claire Goodwin



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Executive Summary

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

This document provides details of the data confidence assessment for Carlingford Lough pMCZ.

Additional information on Carlingford Lough pMCZ and proposed features includes:

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

Glossary of Terms and Acronyms

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

AFBI – Agri-food and Biosciences Institute

BGS – British Geological Survey

EMODnet – The European Marine Observation and Data Network

EUNIS – 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

JNCC – Joint Nature Conservation Committee

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

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

MED – Marine Environment Division

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

NISS – Northern Ireland Sublittoral Survey

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

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

pMCZ – Proposed Marine Conservation Zone

pMCZ Feature(s) – proposed Marine Conservation Zone features that will underpin the MCZ designation

PSA – Particle Size Analysis

SM – Subtidal (sublittoral) mud

SPWS – Sea-pen and white sea slug communities

SSNI – Sublittoral Survey Northern Ireland

VMS – Vessel Monitoring System

WFD – Water Framework Directive

Proposed name	MCZ	Carlingford Lough	Assessors	CA; CAA; JB; LP; NMcQ; SB
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Carlingford Lough pMCZ (Figure 1) lies on the east coast of Ireland, located north of the navigable channel in the inner part of the Lough, at the border of Northern Ireland and the Republic of Ireland.

Carlingford Lough is proposed for protection of the pMCZ habitat Subtidal mud (SM) ([EUNIS Habitat type A5.3](#)) which contains Sea-pen (*Virgularia mirabilis*) and white sea slug (*Philine aperta*) communities (SPWS) ([EUNIS A5.343](#)). The SM is characterised by a high proportion to fine sediment. The biotope for this habitat feature is [SS.SMu.IFiMu.PhiVir](#) (*P. aperta* and *V. mirabilis* in soft stable infralittoral mud). The White sea slug is the key species in this habitat and demonstrates high seasonal variability. The Sea-pen, a Priority Species in Northern Ireland, is not always present in the biotope, but in the pMCZ reaches high densities. This biotope is very similar to Sea-pen and burrowing megafauna communities (biotope [SS.SMu.CFiMu.SpnMeg](#), which is an OSPAR Threatened and/or Declining Habitat (OSPAR, 2010), but occurs shallower, is less stable, and is not characterised by burrowing megafauna (JNCC, 2014a & Hughes, 1998).

This habitat is currently good condition (Goodwin *et al.*, 2011) and is restricted to the small area proposed as an MCZ. The density of Sea-pens is high (DOE, 2015⁵), with abundances ranging from common (5-9%) to superabundant (20-39%) on the [SACFOR scale](#) (JNCC, 2014b). In the UK and Ireland, these communities are restricted to the most sheltered sea loughs with full salinity conditions. This habitat within the pMCZ is the only known example in Northern Ireland and is one of a few records within the UK (a few more records are reported in the South of Ireland) ([NBN gateway web](#) and [JNCC](#) (2015).

The boundary of the pMCZ was drawn to encompass the extent of the SPWS and to represent the range in diversity of SM habitat within the area. A buffer zone of 100m from aquaculture sites in the area was taken into consideration when developing the pMCZ boundary following pre-consultation discussions with industry representatives. This will enable shellfish operations to continue without impacting the conservation objectives. In addition, the administrative mid-line and navigational channel was taken into account for the southern extent of the boundary.

Protected features (see figure 2)			
Biodiversity	<ul style="list-style-type: none"> • <i>Subtidal (sublittoral) mud (SM):</i> <ul style="list-style-type: none"> - <i>Sea-pen and white sea slug communities (SPWS) (component habitat)</i> 	Geodiversity	<i>n/a</i>

Data used in assessment			
Version of Marine recorder database	<i>Update Nov2014</i>	Other datasets used (specify)	<ul style="list-style-type: none"> - ¹Northern Ireland Sublittoral Survey (NISS) Carlingford Lough 1982-1985 (Marine Recorder database). - ²Sublittoral Survey Northern Ireland (SSNI) Carlingford Lough 2007 & 2012 (Marine Recorder database). - ³DOE Water Framework Directive (WFD) benthos monitoring programme 2013 (MM13-04). MED-Marine Recorder database, Unicorn database reference: BWFDMB13). - ⁴AFBI Carlingford Lough Survey 2012 - video tows. - ⁵DOE Carlingford Lough pMCZ support Spyball camera survey 2015 – drop-camera underwater video/still images, infaunal grabs samples and Particle Size Analysis (PSA). - ⁶JNCC EU SeaMap: A broad-scale physical habitat map for European Seas 2014 v8.3

Summary of Data Confidence Assessment					
Confident in underpinning data		Yes	✓	Partial	No
Confident in presence of identified features?	✓	Data suitable to define extent of individual protected features	✓	Partial	✘
			SM:SPWS		
Summary	<p>The Department has high confidence in the presence of the proposed features and the supporting evidence in the pMCZ.</p> <p>Most of the records for SPWS in the AoS, and individual records of the component species <i>P. aperta</i> and <i>V. mirabilis</i>, were collected during conservation surveys performed by DOE and National Museums Northern Ireland, which was conducted during 1982-1985 (Erwin <i>et al.</i>, 1986), 2007 (Goodwin <i>et al.</i>, 2011) and 2012 using diving photography and transects as sampling methods^{1&2}.</p> <p>Additional records were collected in 2008 and 2009 during the DOE WFD benthos monitoring programme 2013³. AFBI also provided evidence of high density aggregations of Sea-pen presence in the AoS through a video tow survey⁴ in 2012.</p> <p>The survey work undertaken in 2015 by DOE⁵ using an underwater drop-camera confirmed the presence of SPWS (biotope SS.SMu.IFiMu.PhiVir) with high densities of Sea-pens ranging from abundant (10-19%) to superabundant (20-39%) on the SACFOR scale (JNCC, 2014) and white sea slug ranging from frequent (1-5%) to superabundant (20-39%). This survey also supported the extent of the boundary through the verification of suitable broad-scale habitat SM for the component biotope combined with the limited distribution of Sea-pen in the area.</p> <p>The broad coverage of grab and Particle Size Analysis (PSA) samples taken during the DOE Carlingford Lough pMCZ Spyball camera Survey 2015⁵ confirmed the sediment types and presence of SM as derived from the predictive habitat maps (EU SeaMap⁶).</p>				

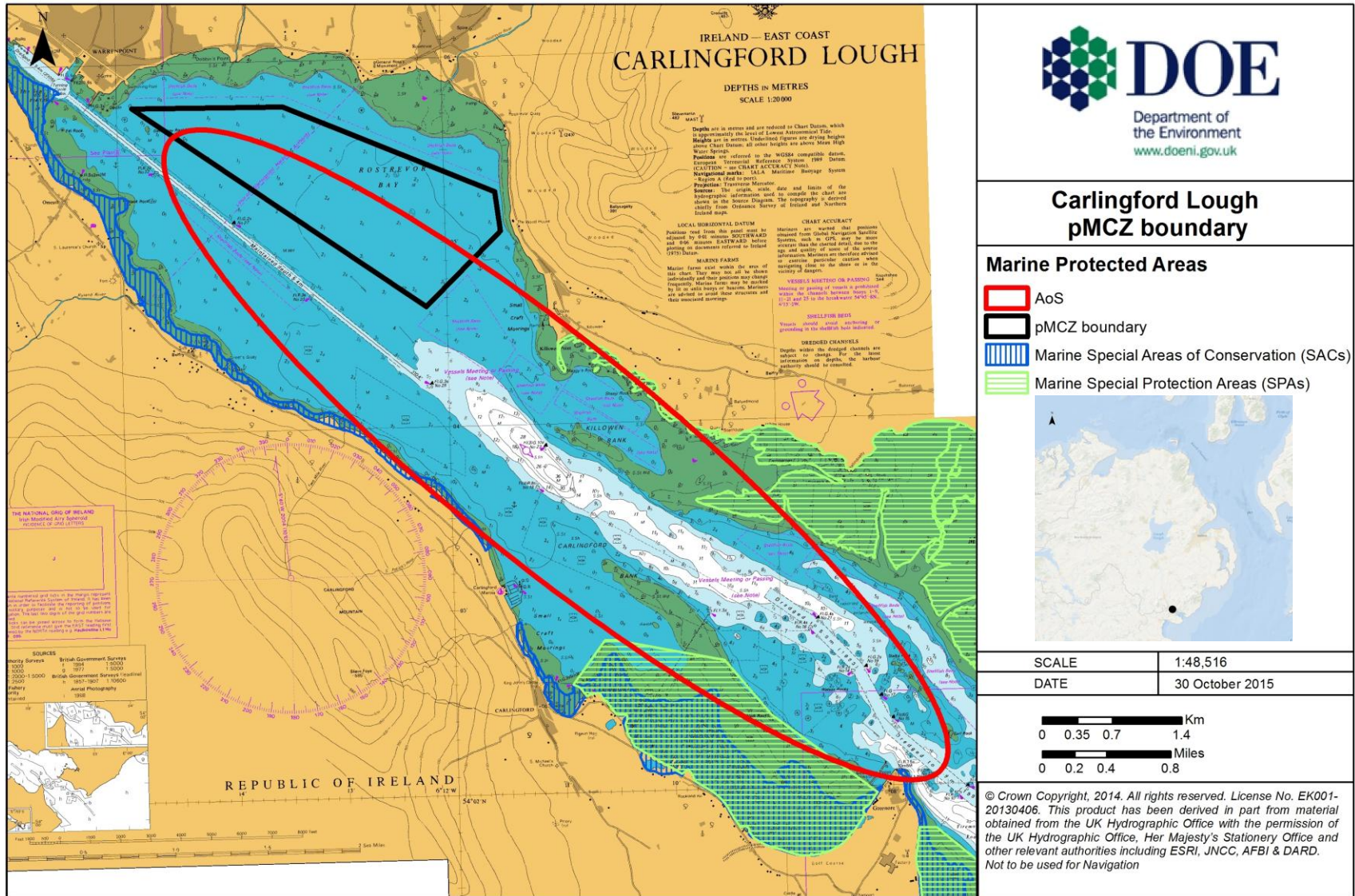


Figure 1 Location of Area of Search and the proposed boundary of Carlingford Lough pMCZ

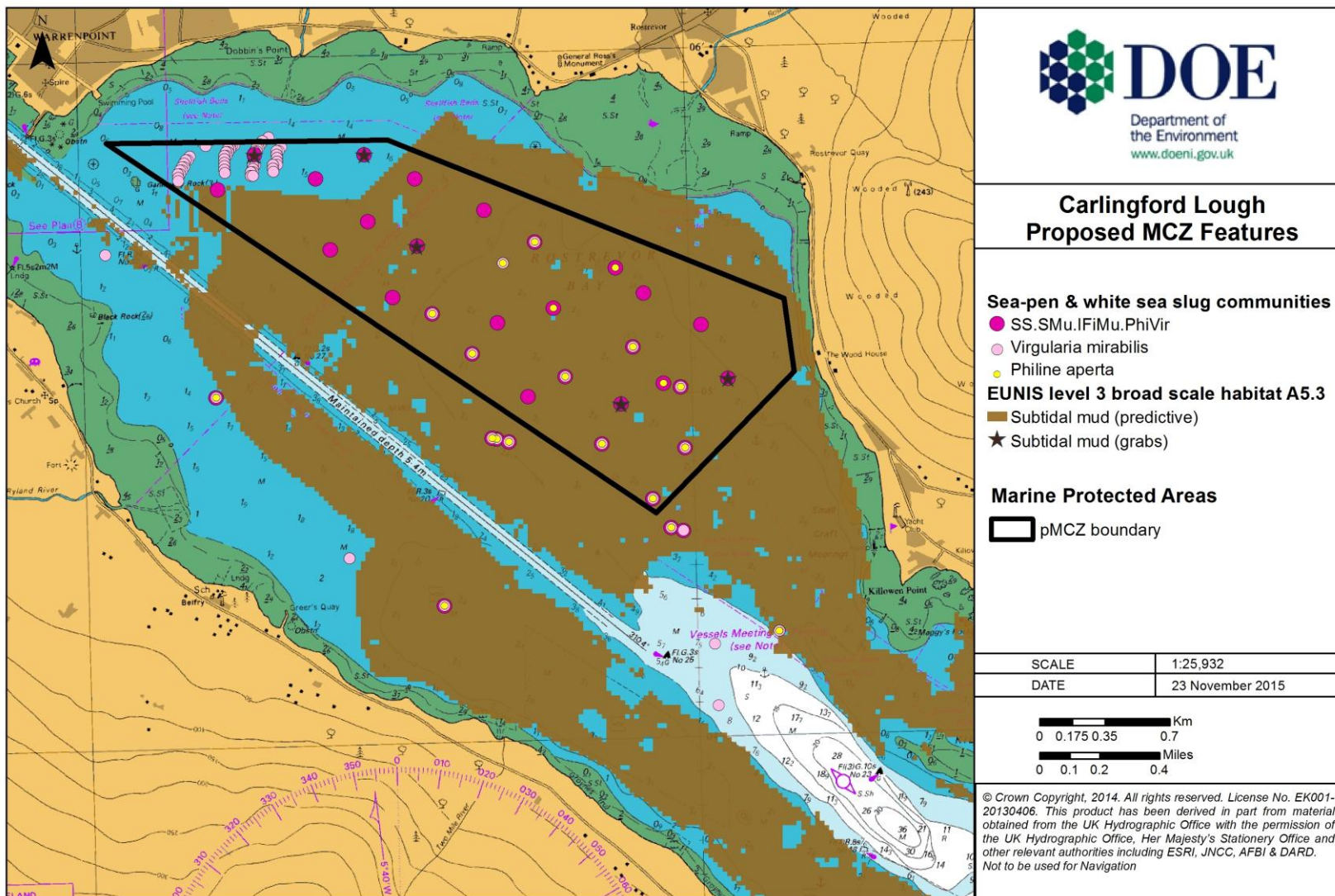


Figure 2 Distribution of the pMCZ features in the Carlingford Lough

Data confidence assessment

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

Age of data (Figure 3)

Multiple records collected within last 10 years	SM:SPWS	Multiple records collected 10-25 years ago	SM:SPWS	Multiple records >25 years old	-
Comments	<p>In the AoS, the majority of data for the habitat SPWS was collected during diving surveys in 1984¹ (Erwin <i>et al.</i>, 1986), 2007 and 2012^{1&2}. Additional data was available from the DOE WFD Monitoring programme 2013³, with grab samples taken during 2008 and 2009.</p> <p>Further evidence of the Sea-pen (<i>V. mirabilis</i>) in the area was recorded by AFBI in 2012⁴.</p> <p>Recent data on SPWS were recorded in grabs and videos during the pMCZ Spyball camera survey in 2015⁵.</p> <p>Information on SM was derived from predictive habitat maps (EU SeaMap, JNCC 2014c⁶). PSA data confirming SM in the pMCZ was acquired from sediment samples collected in 2015⁵.</p>				

Source of data (Figure 4)

Targeted data collection for nature conservation purposes	✓	Statutory monitoring (marine licensing etc.)	✓	Fisheries survey work	-
Data collection associated with development proposals (EIA etc.)	-	Recreational / volunteer data collection	-	Other (specify) – EUNIS predictive maps, PSA data	✓
Comments	<p>The majority of the proposed feature records have been collected through targeted nature conservation surveys (SSNI Carlingford Lough², AFBI Carlingford Lough Survey 2012⁴ and DOE Carlingford Lough pMCZ Spyball camera survey work 2015⁵).</p> <p>Additional data was derived from grab samples collected by DOE during monitoring surveys. In this case the grabs were collected as part of the DOE WFD benthos monitoring programme 2013³.</p> <p>The EU SeaMap predictive habitat map used in this assessment was developed by JNCC and The European Marine Observation and Data Network (EMODnet, 2014)⁶.</p>				

Sampling methods / resolution							
Feature	Modelled	Acoustic / remote sensing	Remote video / camera	Infaunal - grab / core	Sediment sampling	Diving	Fisheries sampling
SM:SPWS	✓		✓	✓	✓	✓	
Comments	<p>A number of sampling methods have been used to collect information on the feature of interest in the pMCZ.</p> <p>The predictive seabed habitat mapping project EU SeaMap2014 was developed by JNCC and The EMODnet⁶; this provides a modelled broad scale subtidal mud habitat in the pMCZ (based on validation samples). The predictive mapping also proposes the presence of the biotope SS.SMu.IFiMu.PhiVir within shallow waters in the main body of the Lough.</p> <p>Remote video and photographic imagery sampling (using a drop-down Spyball camera camera), undertaken by DOE across the pMCZ in RV Capitella, provided an overview of the composition and distribution of the SPWS habitat in the area⁵.</p> <p>Additional video tows were recorded by AFBI (2012)⁴ using a towed digital video camera in the inner area of the pMCZ.</p> <p>Infaunal grab sampling was targeted as part of the DOE WFD benthos monitoring programme 2013³. The PSA data for SM comes from sediment samples collected during the DOE Carlingford Lough pMCZ Spyball camera survey work 2015⁵.</p> <p>SSNI Carlingford Lough 2012 and previous SSNI surveys in the Lough^{1&2} were conservation diving surveys that provided photographic and video evidence of various biotopes and key species.</p>						

Data coverage (Figures 3 to 6)							
<i>Across the pMCZ</i>							
Large numbers of proposed feature records distributed across pMCZ		Numerous proposed feature records scattered across the pMCZ with some clumping		Numerous proposed feature records possibly with some clumping. Boundary not defined solely by recorded feature distribution	✓	Few or isolated feature records - possibly clumped?	

<i>For Individual features</i>					
Multiple records of individual features providing indication of extent and distribution throughout pMCZ?	✓ SM:SPWS	Few or scattered records of specific features making extent and broad distribution assessment difficult?		Few or isolated records of specific feature records	
Are acoustic remote sensing data available to facilitate the development of a full coverage predictive seabed habitat map?	No.				

Comments	<p>Subtidal (sublittoral) mud (SM) (Figure 6)</p> <ul style="list-style-type: none"> • 2014 JNCC EU SeaMap predictive habitat map⁶ – This predicts that Subtidal (sublittoral) mud occurs across almost the entire pMCZ. Five validation samples in the area indicated the biotope SS.SMu.IFiMu.PhiVir - A5.343 was present. • 2015 DOE Carlingford Lough pMCZ Spyball camera survey⁵ – 16 sediment samples were collected by the DOE within the predicted SM sediment in the AoS and pMCZ. PSA was carried out for 5 of the stations for sediment characterisation and classed according to EUNIS/BGS (British Geological Survey) modified Folk class provided. The results of the PSA identified all sediment samples as ‘slightly gravelly sandy mud’ (EUNIS 5.3). <p>SM: Sea-pen and white sea slug communities (SPWS) (Figure 5)</p> <ul style="list-style-type: none"> • 2012 AFBI Carlingford Lough video tows survey⁴ – The three tows deployed in the inner part of the pMCZ recorded high densities of the Sea-pen (<i>V. mirabilis</i>) The video footage also supported previous records of the broad scale habitat SM as ‘soft mud sea floor’. • 2014 Marine Recorder^{1,2&3} – There are multiple records of SPWS, <i>V. mirabilis</i> and <i>P. aperta</i> in the Marine Recorder database recorded as part of the NISS and SSNI (Sublittoral Survey Northern Ireland) Carlingford Lough programmes (1982-2012)¹⁺². SPWS was recorded in the diving surveys in 1982-1985, 2007 & 2012. <i>V. mirabilis</i> was recorded as abundant, occasional and rare on the SACFOR scale (JNCC, 2014) while <i>P. aperta</i> was recorded as abundant, common, frequent and occasional. <p>There are also several records for the presence of SPWS from the DOE WFD Benthos monitoring programme (2013)³. There are three sampling stations within the AoS (station CLBR2 and CLBR8) and pMCZ (station CLBR4). SPWS was recorded inside the pMCZ in 2008 and in the AoS from years 2000, 2002, 2006, 2008-2010.</p> <ul style="list-style-type: none"> • 2015 DOE Carlingford Lough pMCZ support Spyball camera survey⁵ – 16 stations within the pMCZ were filmed with a drop-camera remotely controlled from RV Capitella in June 2015. The video footage was viewed using freeze-frame; slow motion and standard play speed as necessary to enable the identification of as many conspicuous species as possible and a determination of broad substrate type. The video footage showed clear presence of sea-pens in 15 of the 16 stations sampled in the pMCZ with abundances between common (5-9%) and superabundant (20-39%) on the SACFOR scale (JNCC, 2014b). <i>P. aperta</i> was recorded in all the stations sampled from frequent (1-5%) to superabundant (20-39%; refer to Figure 5).
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The Evidence Base (Figures)

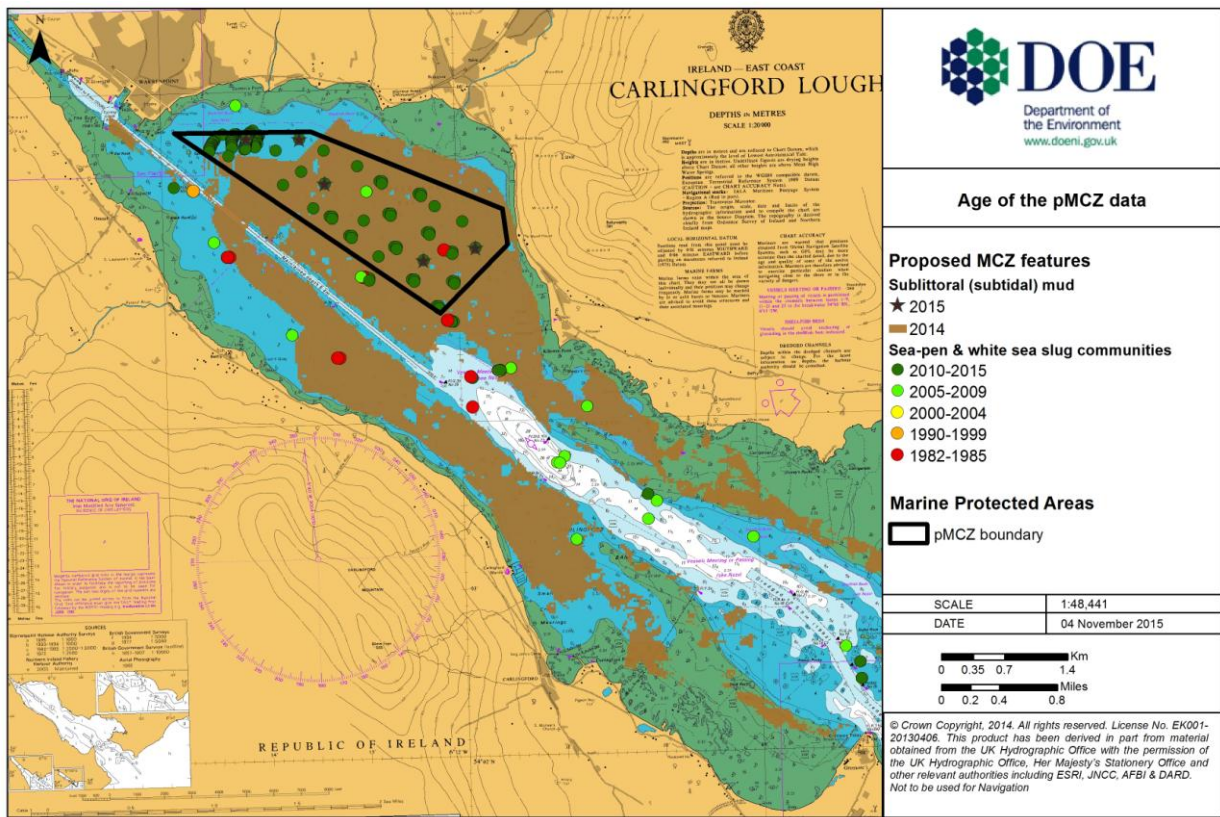


Figure 3 Age of the feature data collected in Carlingford Lough pMCZ

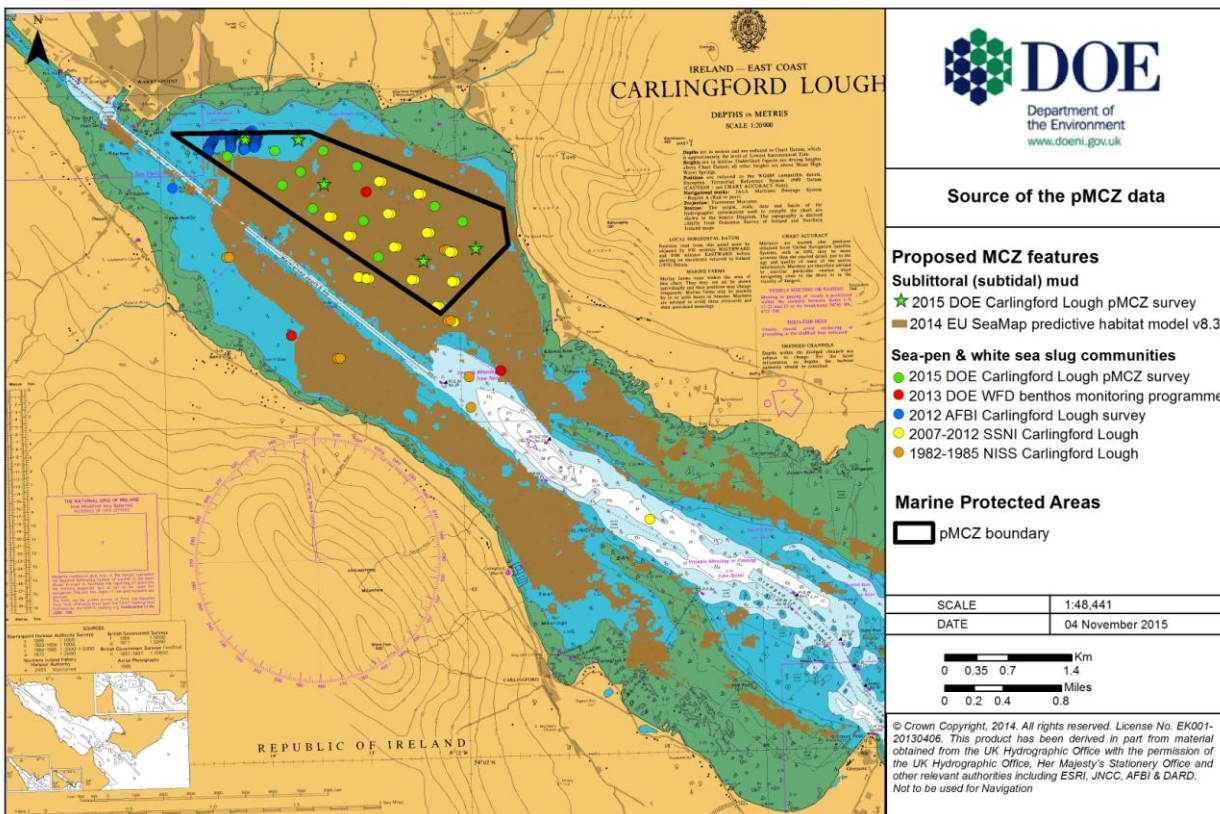


Figure 4 Source of the feature data collected in Carlingford Lough pMCZ

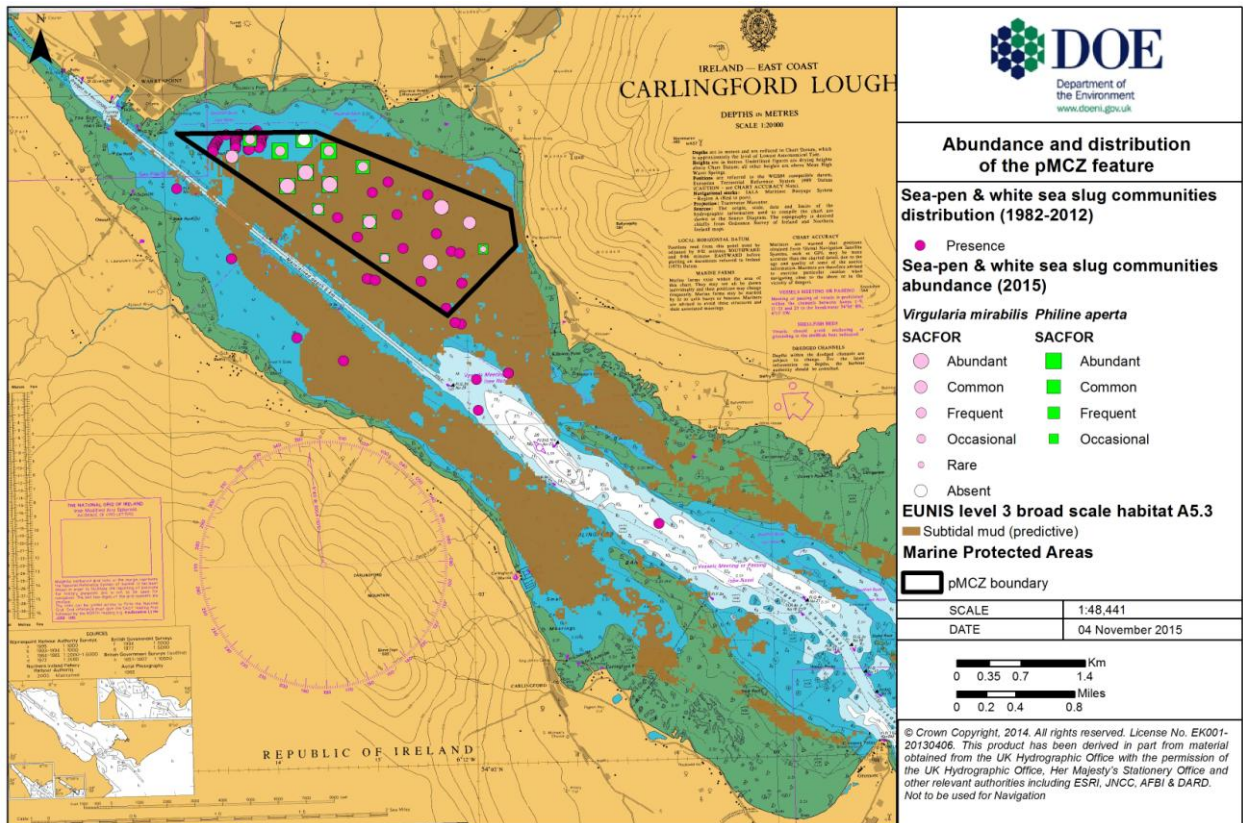


Figure 5 Abundance and distribution of feature data collected in Carlingford Lough pMCZ

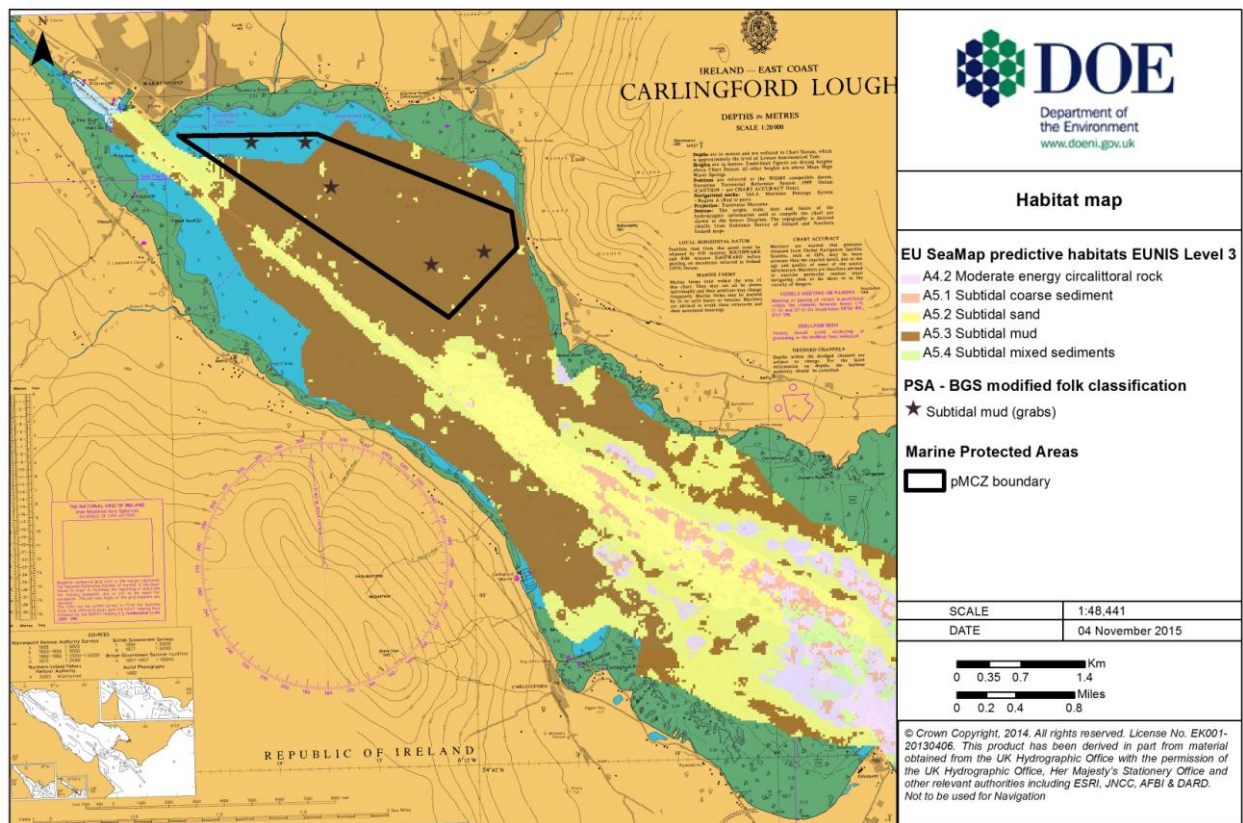



Figure 6 Habitat Map of Carlingford Lough pMCZ and surrounding seabed

Data sources and Bibliography		
Data source (used in assessment)	Reference	Features covered
¹ Northern Ireland Sublittoral Survey (NISS), Carlingford Lough 1982-1985 (Marine Recorder database)	Erwin, D.G., Picton, B.E., Connor, D.W., Howson, C.M., Gilleece, P. and Bagues, M.J. 1986. The Northern Ireland Sublittoral Survey. Ulster Museum.	SP
² Sublittoral Survey Northern Ireland (SSNI) Carlingford Lough 2007 & 2012* *2012 data was submitted to Marine Recorder database (no report produced).	Goodwin, C., Picton, B., Breen, J., Edwards, H. and Nunn, J. 2011. Sublittoral Survey Northern Ireland (2006 – 2008). Northern Ireland Environment Agency Research and Development Series No 11/01	SP
³ DOE Water Framework Directive (WFD) benthos monitoring programme 2013.	N/A	SM
⁴ AFBI Carlingford Lough Survey 2012.	N/A	SM:SPWS
⁵ DOE Carlingford Lough pMCZ support Spyball camera survey 2015	N/A	SM:SPWS
N/A	Hughes D.J. Sea pens & burrowing megafauna (volume III). 1998. An overview of dynamics and sensitivity characteristics for conservation management of marine SACs. Scottish Association for Marine Science (UK Marine SACs Project).	SP
N/A	JNCC. 2014a. Clarifications on the habitat definitions of two habitat FOCl: Mud habitats in deep water and sea-pen and burrowing megafauna. Peterborough, UK.	SM
N/A	JNCC. 2014b. SACFOR scale. http://jncc.defra.gov.uk/page-2684	SP WS
⁶ JNCC EU SeaMap: A broad-scale physical habitat map for European Seas 2014c v8.3	EU SeaMap. A broadscale physical habitat map for European Seas. 2014c. EMODnet. EUSeaMap: A broad-scale physical habitat map for European Seas.	SM
N/A	JNCC. 2015. The Marine Habitat Classification for Britain and Ireland Version 15.03. Available from: http://www.jncc.gov.uk/marine/biotopes/biotope.aspx?biotope=jnccmncr00000557	SPWS
N/A	OSPAR Commission. Background Document for Sea-pen and Burrowing megafauna communities. 2010. http://qsr2010.ospar.org/media/assessments/Species/P004_81_Seapen_and_burrowing_megafauna.pdf	SP

Data sources and Bibliography

Data source (used in assessment)	Reference	Features covered
N/A	National Biodiversity Network (NBN) Gateway. https://data.nbn.org.uk/	SPWS



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

