



Scottish Natural Heritage
Dualchas Nàdair na h-Alba

All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Scottish MPA Project
Data Confidence Assessment

LOCH SUNART TO THE SOUND OF JURA
NATURE CONSERVATION MPA

SEPTEMBER 2014

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Document version control

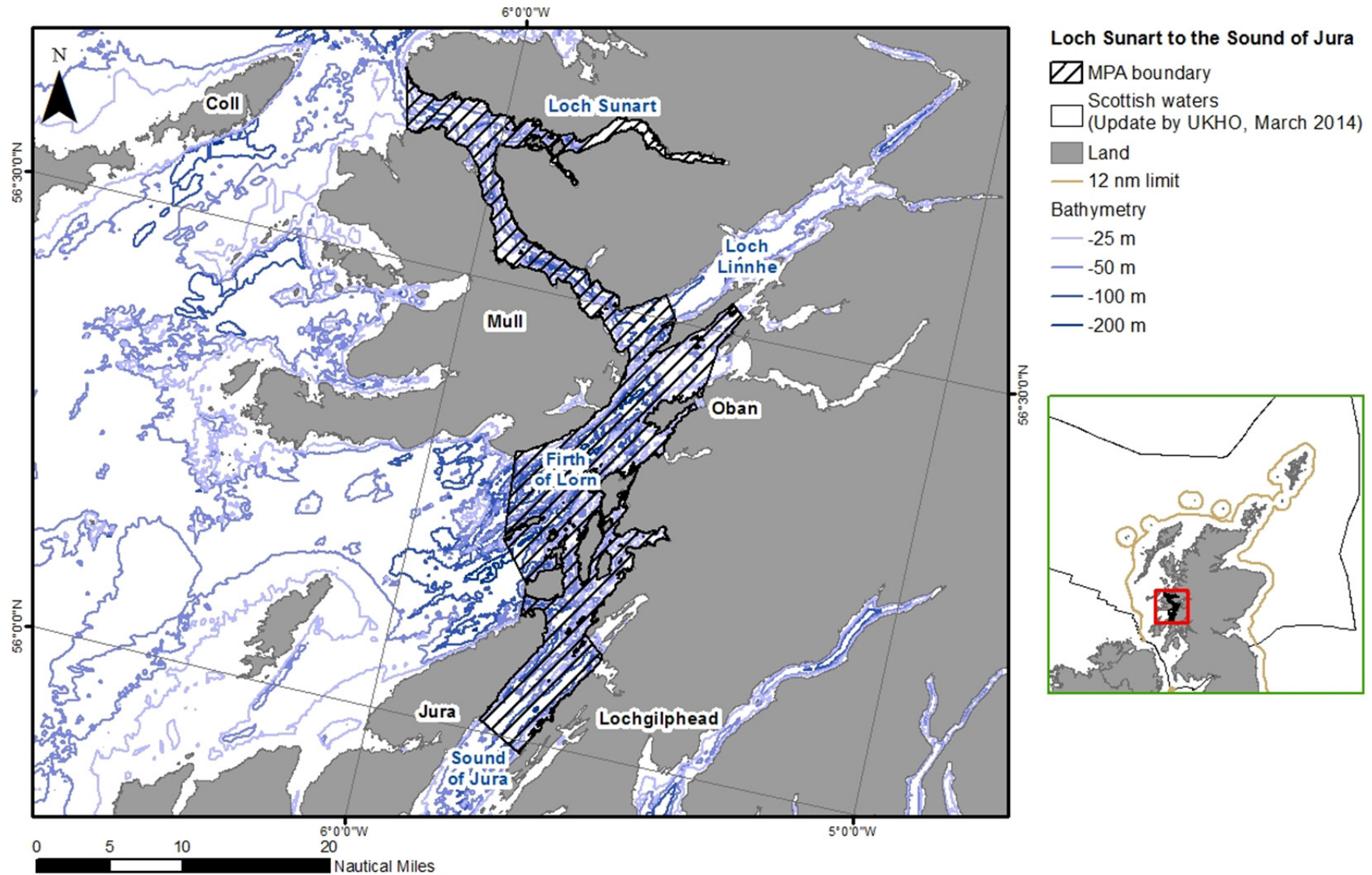
Version	Date	Author	Reason / Comments
Version 1	21/09/2012	Laura Clark, Peter Wright and Ben James	Revised protected feature / MPA proposal format, updating search location version (ver. 6).
Version 2	02/10/2012	Siobhan Mannion	Review and update of full data confidence assessment.
Version 3	15/10/2012	Ben James and Laura Clark	Initial review. Production and insertion of revised mapping.
Version 4	15/10/2012	John Baxter	QA review.
Version 5	19/10/2012	Laura Clark and Lisa Kamphausen	Refinements in response to QA review comments.
Version 6	09/11/2012	Ben James	Review.
Version 7	29/11/2012	Ian Bainbridge	QA review and sign-off.
Version 8	19/07/2013	Laura Clark	Updated into possible MPA format.
Version 9	16/08/2013	Ben James	Review.
Version 10	20/08/2013	John Baxter	QA review and sign-off.
Version 11	13/08/2014	Ben James and Morven Carruthers	Updated into MPA format with refinements in response to 2013 consultation and IER feedback.
Version 12	21/08/2014	John Baxter	QA review and sign-off.

Distribution list

Format	Version	Issue date	Issued to
Electronic	7	14/12/2012	SNH web publication.
Electronic	10	20/08/2013	SNH web publication [A990688 / 7(#7)].
Electronic	12	01/09/2014	Marine Scotland officials.
Electronic	12	02/09/2014	SNH web publication [A1333264 / 18(#18)].

LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

Figure 1 Loch Sunart to the Sound of Jura MPA



Map projected in Europe Albers Equal Area Conic (Modified Standard Parallels - Standard Parallel 1 = 50.2; Standard Parallel 2 = 58.5). The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). Landmass Ordnance Survey © Crown Copyright and database right 2013. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. Bathymetry © Crown Copyright 2014. All rights reserved. License No. EK001-201310001. Not to be used for navigation. MPAs ©SNH 2014.

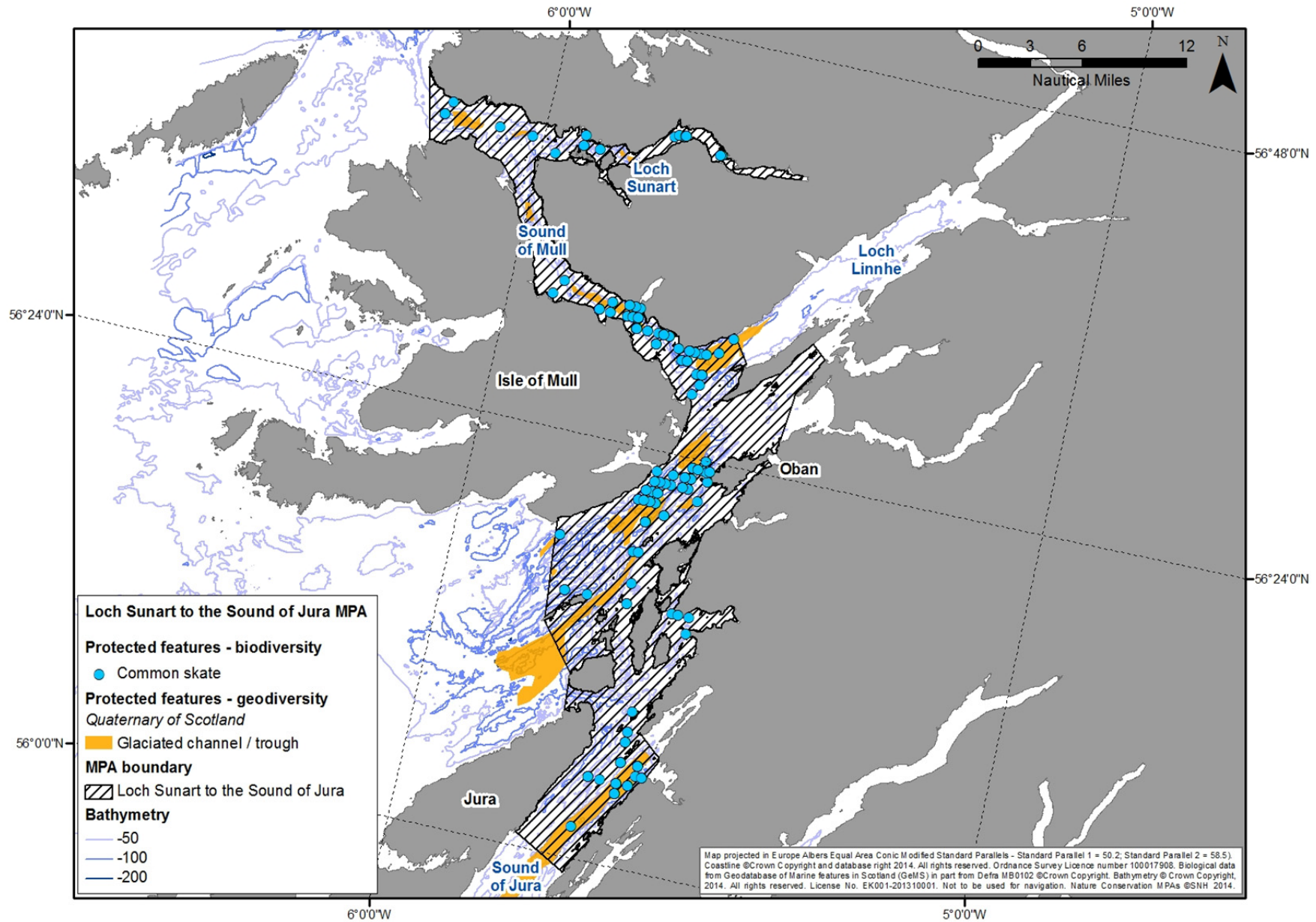
LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

MPA name		Loch Sunart to the Sound of Jura		Assessor(s)		LC; PW; BJ; SM; MC	
<p>Loch Sunart to the Sound of Jura MPA shown on Figure 1 extends from the Sound of Jura northwards, incorporating the Firth of Lorn, the south-western part of Loch Linnhe and through the Sound of Mull into Loch Sunart. The MPA encompasses a large portion of the range of the relatively high numbers of the critically-endangered common skate present in this area. The MPA also includes geodiversity interests from the Quaternary of Scotland (as part of the Loch Linnhe and Loch Etive key geodiversity area - Brooks <i>et al.</i>, 2013). It is within a number of the deep glaciated channels associated with this geodiversity feature that large, reproductively mature common skate are resident (Marine Scotland Science, 2012; Neat <i>et al.</i>, 2014). There is also some evidence that the shallow reef areas within the MPA are used by common skate for laying their egg-cases. However, there is no evidence to point toward specific parts of the area as nursery grounds for this species. Reef habitats are a designated feature of two existing marine Special Areas of Conservation (Sunart and the Firth of Lorn), with which this MPA significantly overlaps (see Map F). Other seabed habitat features within Loch Sunart are also the subject of a separate Nature Conservation MPA (Scottish Government, 2014; SNH, 2014). Loch Sunart to the Sound of Jura MPA was developed from, and fully encompasses, four discrete third-party MPA proposals from the Scottish Sea Angling Conservation Network (SSACN).</p>							
Protected features							
Biodiversity		Common skate ¹ (CS)		Geodiversity		Quaternary of Scotland - glaciated channels / troughs (GEO)	
Data used in assessment							
Version of GeMS database		Ver.4		Other datasets used in feature maps (specify) -		<ul style="list-style-type: none"> Contextual mapping (coastline; bathymetry; MPA boundaries; other protected areas). Marine Recorder data [for null records on Map A - ver. 190614]. Civil Hydrography Programme (CHP) survey areas (Map E). 	
Summary of data confidence assessment (see detailed assessment on following pages)							
Confident in underpinning data				Yes	✓	Partial	No
Confident in presence of identified features?		✓ All features	Data suitable to define extent of individual protected features		✓ CS	Partial GEO	*
Summary		<p>We have high confidence in the underpinning data for this MPA and in the presence of the protected features (for known distribution see Figure 2 overleaf). Many of the records of common skate are less than 12 years old although the available data span all three age classes (<6 to >12 years old). The most recent records come from conventional tag-recapture work undertaken by recreational anglers under the auspices of the Scottish Shark Tagging Programme (SSTP) between 2009 and 2011, and Marine Scotland Science electronic tagging and telemetry studies completed in October 2012 (Neat <i>et al.</i>, 2014). The MPA boundary encompasses >90% of common skate recaptures from animals tagged within this area.</p> <p>The glaciated troughs and channels (Brooks <i>et al.</i>, 2009) are present throughout the MPA (see Figure 2). Analysis of available acoustic survey data may help to delineate additional interests representing the Quaternary of Scotland geodiversity feature within this area including moraines.</p>					

¹ Recent studies have shown that the original common skate MPA search feature is in fact two distinct species - the flapper skate and the blue skate. It is the flapper skate *Dipturus intermedius* that is predominantly recorded in Scottish waters and is the interest within Loch Sunart to the Sound of Jura MPA.

LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

Figure 2 The known distribution of protected features within Loch Sunart to the Sound of Jura MPA



LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

Data confidence assessment		Our assessment of data confidence is based on consideration of the age and source of the data, sampling methods used and overall coverage across the MPA (see also Maps A - E). Other protected areas are shown on Map F.						
Age of protected feature data (Map A)								
Number of records collected within last 6 years		Many CS;GEO	Number of records collected 6-12 years ago		Many CS	Number of records >12 years old		Many CS
Comments		<p>The data available for common skate span all three age classes, with tag-recapture records available from the mid-1970s (work initiated by Glasgow Museum in the Sound of Mull, Firth of Lorn and the passage to Coll² - see Sutcliffe, 1994; Little, 1995, 1997, 1998) through to the end of 2011. The tagging studies are currently ongoing as part of the SSTP³ (see Neat et al., 2014). Electronic tagging work (attaching data storage tags to collect information on water depth and temperature that provide information on habitat utilisation by the skate and movement patterns upon recapture) was first undertaken within the MPA in Loch Sunart in 2008 (Wearmouth and Sims, 2009) and subsequently in 2011 / 2012, when Marine Scotland Science (MSS) completed advanced tagging and telemetry studies using a greater number of common skate within the Sound of Jura (reported in Neat et al., 2014). Information on the glaciated channels / troughs was derived from available bathymetric survey data (Brooks et al., 2009).</p>						
Source of protected feature 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) -		
Comments		<p>The common skate data come primarily from targeted studies undertaken for nature conservation purposes such as the Glasgow Museum tag-recapture surveys (Sutcliffe, 1994; Little, 1995, 1997, 1998) and more recent electronic tagging and telemetry studies (Wearmouth and Sims, 2009 - data not held within GeMS; Neat et al., 2014 - recent SSTP records within the Sound of Jura on Map B). The Scottish Shark Tagging Programme continues the conventional tag-recapture work started by Glasgow Museum in the mid-1970s and is reliant on recreational sea anglers and 'catch and release' practices. A small number of records within the MPA come from surveys undertaken to inform fisheries management e.g. Marine Scotland Science west coast trawls, and a single common skate record was derived from the Seasearch volunteer diver recording programme. The geodiversity interests, and the associated key area that the MPA overlaps, were defined through a series of data collation and analysis projects undertaken for nature conservation purposes (Brooks et al., 2009; 2013).</p>						
Sampling methods								
Feature	Modelled	Acoustic / remote sensing	Tagging / telemetry	Infaunal - grab / core	Sediment	Fisheries survey	Visual census	
CS			✓			✓	✓	
GEO	✓	✓						

² Tagging records for the 'passage to Coll' area are outwith the MPA boundary and are not shown on Map A.

³ For more information on the Scottish Shark Tagging Programme (SSTP) see - <http://www.tagsharks.com/about>

LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

Sampling methods						
Comments	<i>Common skate records within the MPA have been collected through fisheries sampling (e.g. trawl data), recreational sea angling (tag / recapture programmes including the use of electronic data storage tags) and acoustic telemetry studies (Neat et al., 2014). There is one diver record of common skate (visual census). The modelled distribution of glaciated channels / troughs was determined through available bathymetric acoustic survey data (Brooks et al., 2009).</i>					
Protected feature data coverage (Maps A - E)						
Across the MPA						
Large numbers of protected feature records distributed across the MPA		Numerous protected feature records scattered across the MPA with some clumping	✓	Numerous protected feature records possibly with some clumping. Boundary not defined solely by recorded feature distribution		Few or isolated protected feature records - possibly clumped
For individual features						
Multiple records of individual protected features providing an indication of extent and distribution throughout the MPA	✓ CS	Few or scattered records of specific protected features making extent and broad distribution assessment difficult	✓ GEO	Few or isolated records of specific protected features		
Are acoustic remote sensing data available?	<i>A number of Civil Hydrography Programme (CHP)-led acoustic multibeam surveys were completed in this area between 2011 and 2013 (CHP, 2012a - c; all areas displayed on Map E have been surveyed⁴). Multibeam data for the Firth of Lorn area were collected in 2012 through the INIS Hydro Project⁵ (Map E). SNH commissioned a bathymetric sidescan survey of Loch Sunart in 2001 (essentially filling the gap seen on Map E) as part of work to map the distribution of benthic habitat interests of the existing Sunart SAC (Bates et al., 2004). Collectively, these surveys provide almost 100% acoustic coverage of the MPA.</i>					
Comments	<i>Trawl survey data indicate that some areas on the west coast of Scotland, such as that encompassed by the Loch Sunart to the Sound of Jura MPA, support a higher than average density of common skate (MSS, 2012). Tag-recapture records from anglers and recent telemetry data (Neat et al., 2014) demonstrate long-term site fidelity and provide an indication of the distribution of the species within the MPA. Common skate have been recorded across the full extent of the area but for some parts there are a greater number of records than others e.g. the Sound of Jura, the south-eastern end of Mull at the top of the Firth of Lorn, and the lower section of the Sound of Mull. The resolution of some of the data within GeMS has been reduced at the request of the data owners resulting in multiple overlapping 'point' records (the centre points from 1 km grid squares) on Maps A and B. The scale of this 'overlap' is illustrated on Map C. Glaciated channels and troughs are also distributed throughout the MPA (see Figure 2). Further work, including the detailed examination of new multibeam acoustic data, is required to delineate additional components of the Quaternary of Scotland geodiversity feature such as moraines (Brooks et al., 2013). Additional information on the coverage of the geodiversity features within the MPA network is provided in Gordon et al. (2013).</i>					

⁴ See - <https://www.gov.uk/share-hydrographic-data-with-maritime-and-coastguard-agency-mca>

⁵ For more on the INIS Hydro Project see - <http://www.inis-hydro.eu/>

LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

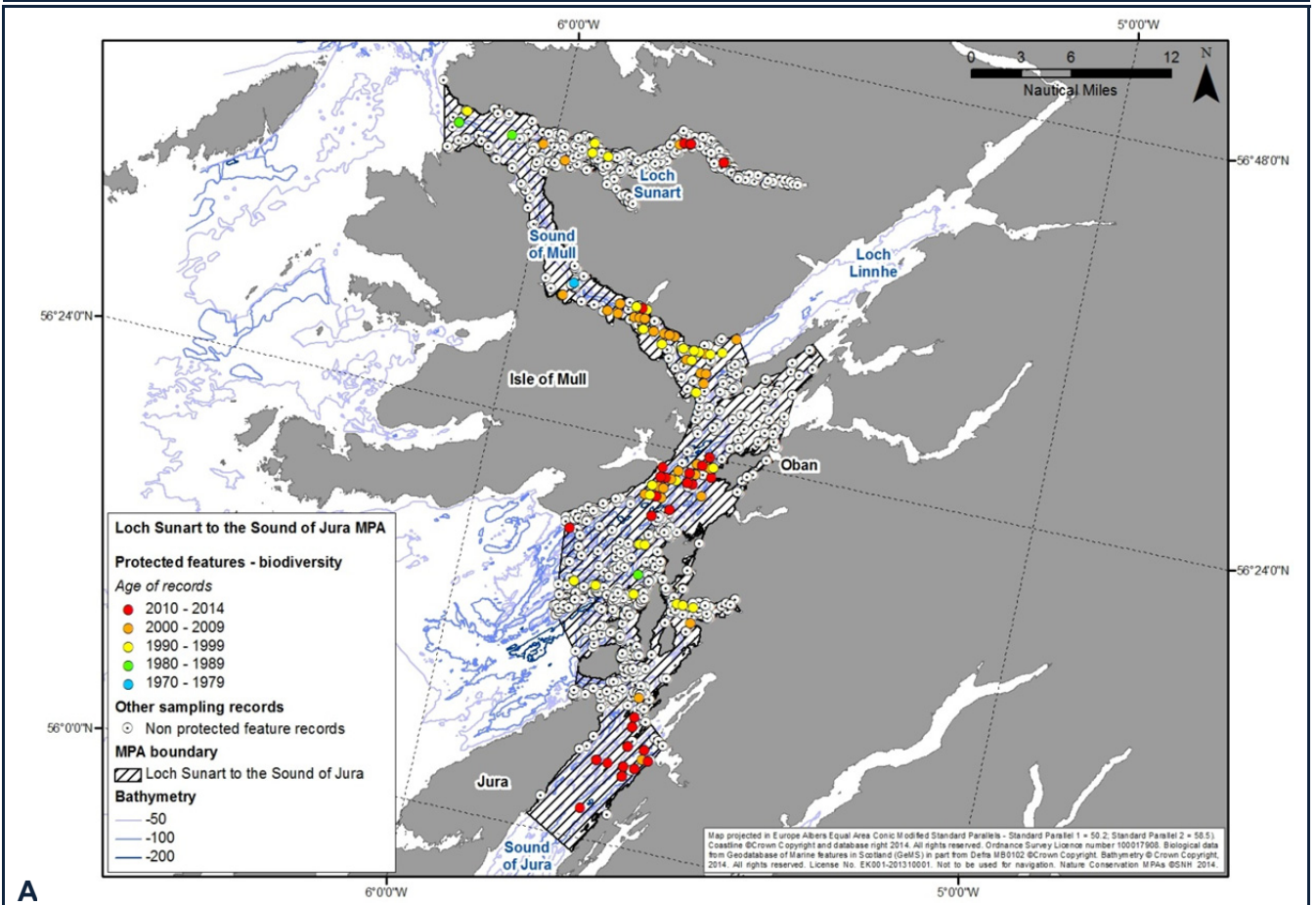
Data sources and bibliography		
Year	Title	Features covered
2014	Neat, F., Pinto, C., Burrett, I., Cowie, L., Travis, J., Thorburn, J., Gibb, F. and Wright, P.J. (2014). Site fidelity, survival and conservation options for the threatened flapper skate (<i>Dipturus cf. intermedia</i>). <i>Aquatic Conservation: Marine and Freshwater Ecosystems</i> . Available from < http://dx.doi.org/10.1002/aqc.2472 >	CS
2014	Scottish Government. (2014). <i>Loch Sunart Nature Conservation Marine Protected Area Order</i> . Scottish Ministerial Order. Available from < http://www.scotland.gov.uk/Resource/0045/00456492.pdf >	[designation order for overlapping Loch Sunart MPA]
2014	SNH. (2014). SNH's advice on selected responses to the 2013 Marine Scotland consultation on Nature Conservation Marine Protected Areas (MPAs). <i>Scottish Natural Heritage Commissioned Report No. 747</i> . Available from < http://www.snh.org.uk/pdfs/publications/commissioned_reports/747.pdf >	[background information on overlapping Loch Sunart MPA]
2013	Brooks, A.J., Kenyon, N.H., Leslie, A., Long, D. and Gordon, J.E. (2013). Characterising Scotland's marine environment to define search locations for new Marine Protected Areas. Part 2: The identification of key geodiversity areas in Scottish waters. <i>Scottish Natural Heritage Commissioned Report No. 432</i> . Available from < http://www.snh.org.uk/pdfs/publications/commissioned_reports/432.pdf >	GEO
2013	Gordon, J.E., Brooks, A.J., Rennie, A.G., James, B.D., Chaniotis, P.D., Kenyon, N.H., Leslie, A.B. and Long, D. (2013). The selection of Nature Conservation Marine Protected Areas (MPAs) in Scotland - assessment of geodiversity interests. <i>Scottish Natural Heritage Commissioned Report No. 633</i> . Available from < http://www.snh.org.uk/pdfs/publications/commissioned_reports/633.pdf >	GEO
2012	CHP. (2012a). <i>Civil Hydrography Programme Data. Inner Approaches to the Firth of Lorn HI1363</i> . Accessed August 2014. Available from < http://www.mcga.gov.uk/hydrography/HI1363_GE.kmz >	[multibeam bathymetry data coverage (Map E)]
2012	CHP. (2012b). <i>Civil Hydrography Programme Data. Loch Linnhe HI1373</i> . Accessed August 2014. Available from < http://www.mcga.gov.uk/hydrography/HI1373_GE.kmz >	[multibeam bathymetry data coverage (Map E)]
2012	CHP. (2012c). <i>Civil Hydrography Programme Data. Sound of Mull HI1364</i> . Accessed August 2014. Available from < http://www.mcga.gov.uk/hydrography/HI1363_GE.kmz >	[multibeam bathymetry data coverage (Map E)]
2012	Marine Scotland Science. (2012). <i>Marine Protected Areas and common skate (Dipturus intermedia). Position paper for 4th MPA Workshop, Heriot-Watt University, 14-15 March 2012</i> . Available from < http://www.scotland.gov.uk/Resource/0038/00389461.doc >	CS
2010	Griffiths, A.M., Sims, D.W., Cotterell, S.J., El Nagar, A., Ellis, J.R., Lynghammar, A., McHugh, M., Neat, F.C., Pade, N.G., Queiroz, N., Serra-Pereira, B., Rapp, T., Wearmouth, V.J. and Genner, M.J. (2010). Molecular markers reveal spatially-segregated cryptic species in a critically endangered fish, the common skate <i>Dipturus batis</i> . <i>Proceedings of the Royal Society B</i> 277 : 1497-1503.	CS
2010	OSPAR. (2010). <i>Background document for common skate, Dipturus batis</i> . OSPAR, London. pp 1-18. Available from < http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf >	CS

LOCH SUNART TO THE SOUND OF JURA NATURE CONSERVATION MPA - DATA CONFIDENCE ASSESSMENT

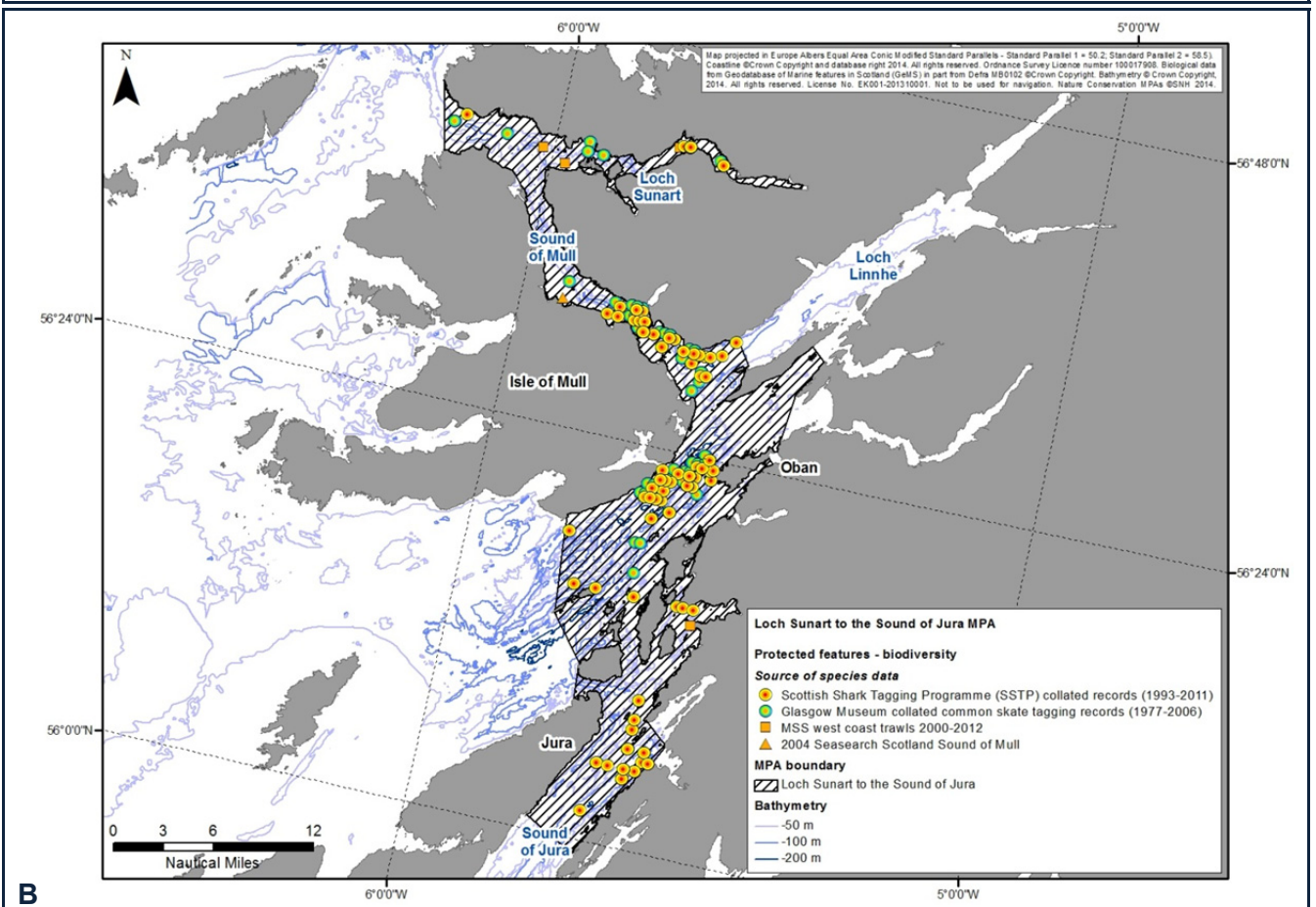
Data sources and bibliography		
Year	Title	Features covered
2009	Brooks, A.J., Roberts, H., Kenyon, N.H. and Houghton, A.J. (2009). <i>Assessing and developing the required biophysical datasets and datalayers for Marine Protected Areas network planning and wider marine spatial planning purposes. Report No 8: Task 2A. Mapping of Geological and Geomorphological Features</i> . ABP Marine Environmental Research Ltd. Available from < http://randd.defra.gov.uk/Document.aspx?Document=mb0102_8589_TRP.pdf >	GEO
2009	Wearmouth, V.J. and Sims, D.W. (2009). Movements and behaviour patterns of critically endangered common skate <i>Dipturus batis</i> revealed by electronic tagging. <i>Journal of Experimental Marine Biology and Ecology</i> 380 : 77-87. Available from < http://www.mba.ac.uk/simslab/publica/Wearmouth&Sims_SkateTagging_JEMBE2009.pdf >	CS
2004	Bates, C.R., Moore, C.G., Harries, D.B., Austin, W. and Lyndon, A. R. (2004). Broad scale mapping of sublittoral habitats in Loch Sunart, Scotland. <i>Scottish Natural Heritage Commissioned Report No. 006</i> . Available from < http://www.snh.org.uk/pdfs/publications/commissioned_reports/F01AA401C.pdf >	[bathymetric acoustic remote sensing data for Loch Sunart]
1998	Walker, P.A. and Hislop, J.R.G. (1998). Sensitive skates or resilient rays? Spatial and temporal shifts in ray species composition in the central north-western North Sea between 1930 and the present day. <i>ICES Journal of Marine Science</i> 55 : 392-402.	CS
1998	Little, W. (1998). Tope and skate tagging off west Scotland: Part 2. <i>Glaucus</i> 9 : 36-38.	CS
1997	Little, W. (1997). Common skate in the Sound of Mull. <i>Glaucus</i> 8 : 42-43.	CS
1995	Little, W. (1995). Common skate and tope: first results of Glasgow Museum's tagging study. <i>Glasgow Naturalist</i> 22 : 455-466.	CS
1994	Sutcliffe, R., (1994). Twenty years of tagging common skate and tope off the west coast of Scotland. In <i>Tag and release schemes and shark and ray management plans. Proceedings of the second European Shark and Ray Workshop, Natural History Museum, London, 15-16 February 1994</i> (ed. R.C. Earll & S.L. Fowler), pp. 14-16. Peterborough, Joint Nature Conservation Committee.	CS

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THE EVIDENCE-BASE

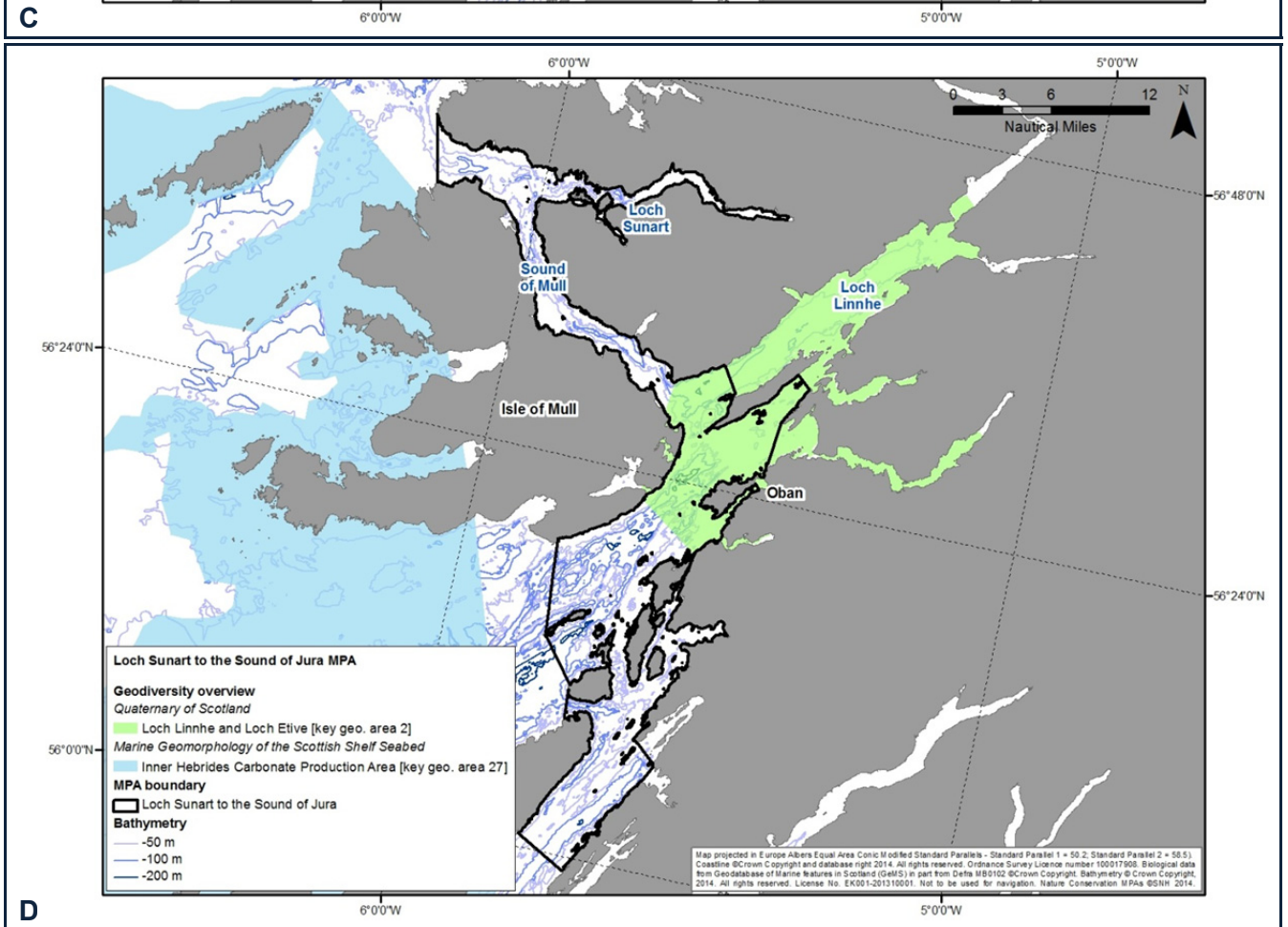
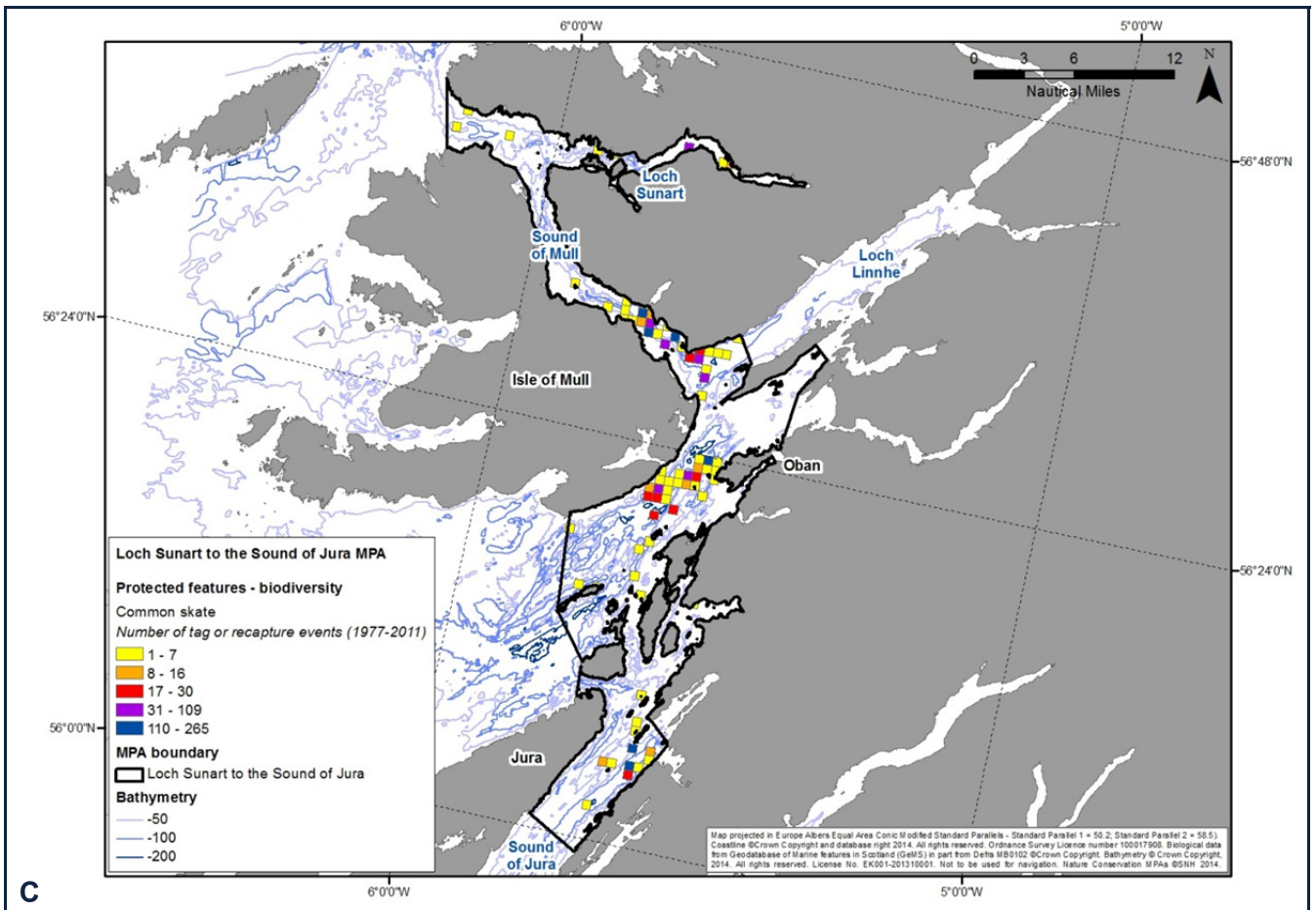


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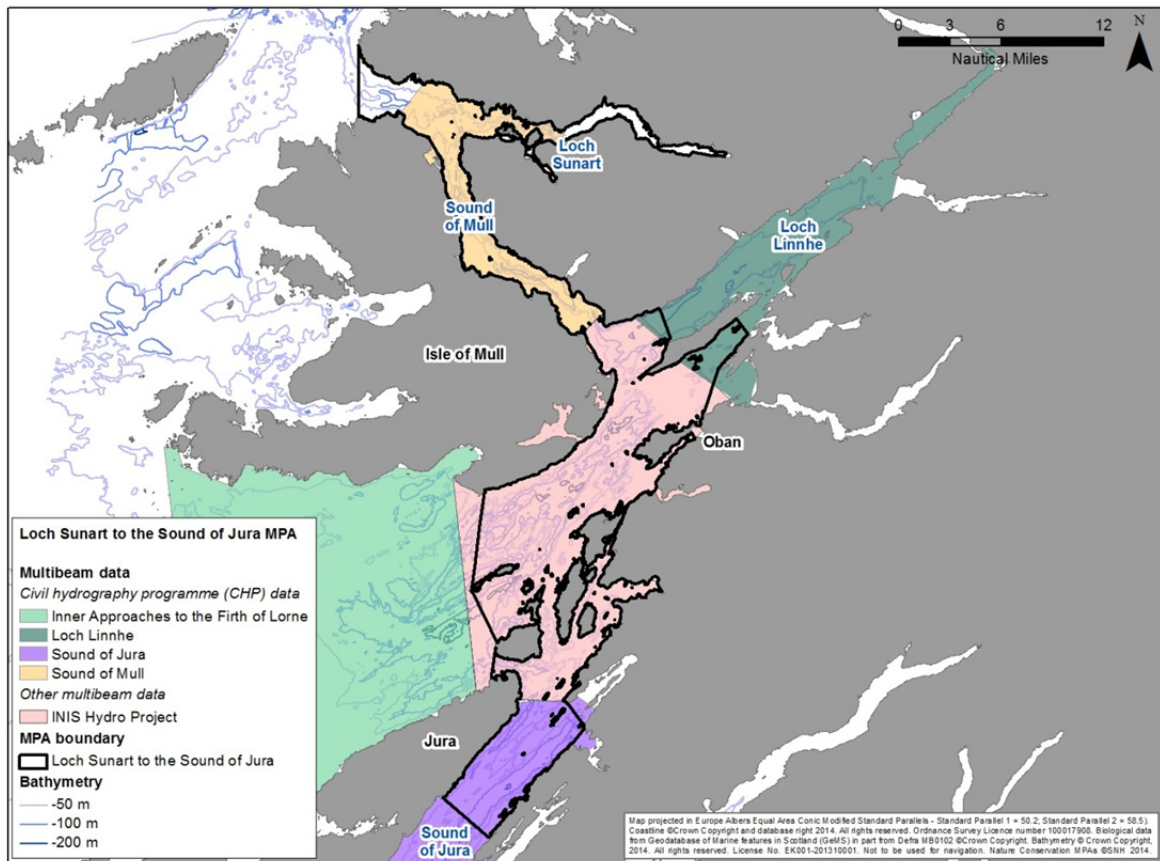


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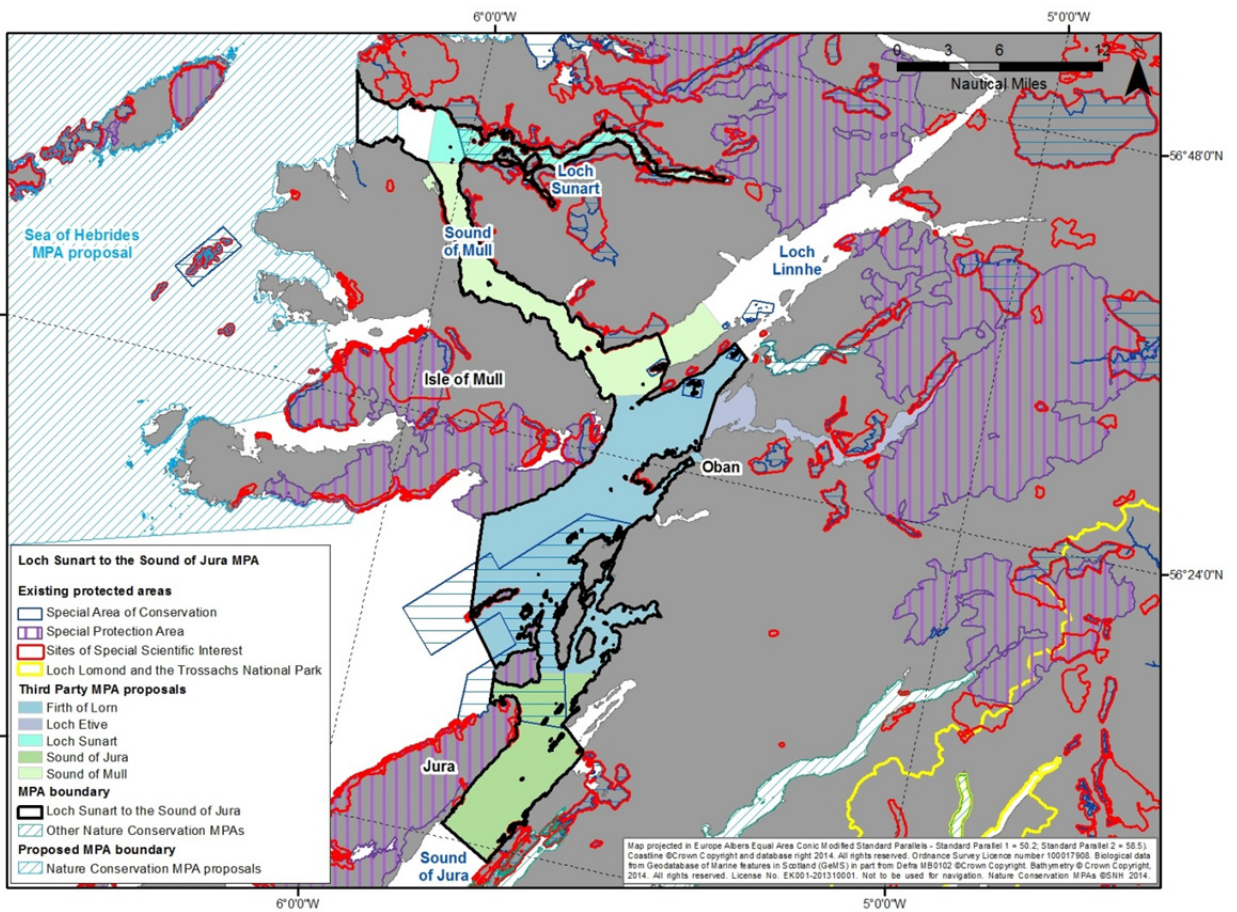
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