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# Marine Scotland

## Development of a Deep Sea Marine Reserve West of Scotland

### APPENDIX C



## Appendix C Site Assessment Tables

### C.1 Faroe-Shetland Reserve (FSR)

#### C.1.1 Site/Feature Summary

Site Extent (km<sup>2</sup>): 36,226

Table 1. Summary of Proposed Protected Features, Data Confidence and Conservation Objectives					FSR
<b>Protected features</b>					
The assessed Faroe-Shetland reserve encompasses the following biodiversity features: burrowed mud, deep sea sponge aggregations, Offshore deep sea muds and offshore subtidal sands and gravels. Offshore deep sea muds and subtidal sands and gravels provide important functional links with Priority Marine Features identified in the sites, including cold-water coral reefs, gardens and deep sea sponge aggregations. These features are considered to be of functional significance, through e.g. biogeochemical cycling and supporting an assemblage of finer resolution habitats and species <sup>1</sup> . The assessed Faroe-Shetland reserve supports a variety of VMEs (such as deep sea sponge aggregations) and species listed as declining or threatened by OSPAR (such as deep sea sponge aggregations, which are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR Commission <sup>2</sup> ). The pMPA hosts important aggregations of various deep sea sponge species <sup>3</sup> . Burrowed muds provide important habitat, contributing to food web dynamics between burrowing species (such as squat lobsters) and benthic-feeding commercial fish species <sup>4</sup> .					
<b>Summary of confidence in presence, extent and condition of protected features and conservation objectives</b>					
Protected Feature	Estimated Area of Feature (km <sup>2</sup> ) or Number of Individuals	Confidence in Feature Presence	Confidence in Feature Extent	Confidence in Feature Condition	Conservation Objective
<b>Biodiversity Features</b>					
Burrowed mud (including Seapens)	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover

<sup>1</sup> Doggett, M., Baldock, B. & Goudge, H. (2018). A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>2</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. Accessed on 05/02/2018.

<sup>3</sup> Howell, K., Piechaud, N., Downie, A., Kenny, A., The distribution of deep-sea sponge aggregations in the North Atlantic and implications for their effective spatial management Deep-Sea Research Part I, 115, pp. 309-320.

<sup>4</sup> Doggett, M., Baldock, B. & Goudge, H. (2018). A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

## Appendix C: Site Assessment Tables

Deep sea sponge aggregations	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Offshore deep sea muds	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
Offshore subtidal sands and gravels	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
<p>Key:</p> <p><sup>a</sup>Biodiversity habitat feature data is from point sources therefore an estimate of the area of features is not available.</p> <p>Area of Features: 907.39 km<sup>2</sup></p> <p>Confidence in biodiversity feature presence and extent:</p> <p>Confidence in biodiversity feature condition:</p>					

## Appendix C: Site Assessment Tables

### C.1.2 Summary of Costs and Benefits

Table 2. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive at present values)				FSR
Human Activity	Cost Impact on Activity			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Economic Costs (Discounted)</b>				
Commercial Fisheries (GVA)	0	Cannot be disclosed	3,180	
Oil and Gas	48	0	0	
Power Interconnectors	5	5	5	
Seabed Mining	3	0	0	
Telecommunication Cables	25	25	25	
<b>Total Quantified Economic Costs</b>	<b>82</b>	<b>31</b>	<b>31</b>	
<b>Total Quantified Economic Costs (GVA)</b>	<b>0</b>	<b>Cannot be disclosed</b>	<b>3,180</b>	
<b>Non-Quantified Economic Costs</b>				
Commercial fisheries	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of value of landings from non-UK vessels: Faroese (28 vessels), Norwegian (8 vessels), French (5 vessels), Dutch (5 vessels), German (4 vessels), Greenland (3 vessels), Danish (2 vessels), Irish (2 vessels), Spanish (1 vessel), Polish (1 vessel), Swedish (1 vessel).</li> <li>• If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> </ul> </li> <li>• Changes to vessel costs/revenue</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of value of landings from non-UK vessels: Faroese (28 vessels), Norwegian (8 vessels), French (5 vessels), Dutch (5 vessels), German (4 vessels), Greenland (3 vessels), Danish (2 vessels), Irish (2 vessels), Spanish (1 vessel), Polish (1 vessel), Swedish (1 vessel).</li> <li>• If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> </ul> </li> <li>• Changes to vessel costs/revenue</li> </ul>	
Oil and Gas	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone oil and gas extraction</li> <li>• Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone oil and gas extraction</li> <li>• Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	
Power Interconnectors	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	
Seabed mining	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone mineral extraction</li> <li>• Future seabed mining activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone mineral extraction</li> <li>• Future seabed mining activity displaced to areas outside of the reserves</li> </ul>	

## Appendix C: Site Assessment Tables

Table 2. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive at present values)				FSR
Human Activity	Cost Impact on Activity			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
Telecommunication cables	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	Delays and potential re-routing of cables where features have been identified and are required to be avoided	Delays and potential re-routing of cables where features have been identified and are required to be avoided	
<b>Note:</b> For detailed information on economic cost impacts on activities, see Table 3.				

## Appendix C: Site Assessment Tables

### C.1.3 Human Activity Summaries

#### Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 3a: Commercial fisheries				FSR
<p>The assessed Faroe-Shetland reserve lies within ICES Division 2a, 4a, 5b and 6a. Approximately 14,000 tonnes (landed weight) of fish and shellfish were landed by UK vessels per annum from the ICES rectangles that the site overlaps<sup>5</sup> (2013-2017), 70% of which were pelagic species.</p> <p>Figure C2 shows that the main gear types used by UK over-12m vessels between 2013 and 2017 in the assessed Faroe-Shetland reserve include midwater trawls, surrounding nets and demersal trawls. There are a few isolated pings from surrounding nets and midwater trawls in the northern part of the reserve, and demersal trawl pings were located sporadically throughout the southern edges of the proposed reserve (Figure C2).</p> <p>The value of landings from the assessed Faroe-Shetland reserve was £379,270 (from VMS data) (annual average for 2013–2017, 2019 prices). A small proportion of these landings have already been excluded or will be excluded from proposed management measures (CFP prohibition on trawling below 800m).</p> <p>Scotmap data indicate that under-15m vessels do not fish in the proposed reserve, but ICES landings data show that there have been a small amount of landings caught in ICES rectangles that overlap the proposed reserve. It is unlikely that these landings were caught inside the reserve due to the depth of water inside the proposed reserve and its remoteness from land.</p> <p>Figure C1 indicates that the main non-UK vessels fishing in the assessed Faroe-Shetland reserve are predominantly from the Faroe Islands. It is not clear which gear types were used by these vessels and no information on landings is available, therefore it is not possible to estimate costs for the intermediate or upper scenarios, but they are likely to be pelagic vessels. The Faroese predominantly fish in the south-western corner of the reserve by the Wyville Thomson Ridge.</p> <p>In terms of landings, UK vessels fishing in the assessed Faroe-Shetland reserve predominantly operate from Peterhead (62%) and Fraserburgh (38%). Landings were made predominantly into Peterhead (80%) and Fraserburgh (20%).</p> <p>The impact under the intermediate scenario cannot be disclosed, as it relates to the operations of fewer than five vessels, however the impact is negligible. Although the individual values affected for individual gear types cannot be disclosed for either the intermediate or upper scenarios, the impact under the intermediate scenario is on lines, and under the upper scenario is predominantly on surrounding nets and midwater trawls.</p>				
Economic Impacts Arising from the Designation and Management of the Site				
	Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts	<ul style="list-style-type: none"><li>• Designation as an MPA with existing management</li></ul>	<ul style="list-style-type: none"><li>• Exclusion of all demersal mobile and static gears</li></ul>	<ul style="list-style-type: none"><li>• Exclusion of all demersal and pelagic static and mobile gears</li></ul>	

<sup>5</sup> Note that these figures include areas within the ICES rectangles that lie outside of the proposed reserve boundaries.

## Appendix C: Site Assessment Tables

			<ul style="list-style-type: none"> <li>It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>	<ul style="list-style-type: none"> <li>It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>
Description of quantified impacts – cost impacts per fleet segment (annual values, £000s, 2019 prices) (on-site)*	<b>Over-12m vessels</b> All affected gears (lines, midwater trawls, surrounding nets) (the costs per gear type cannot be disclosed)	<ul style="list-style-type: none"> <li>Loss of &gt;12m fishing income:</li> </ul> <p>0</p>	<ul style="list-style-type: none"> <li>Loss of &gt;12m fishing income:</li> </ul> <p>Cannot be disclosed</p>	<ul style="list-style-type: none"> <li>Loss of &gt;12m fishing income:</li> </ul> <p>379</p>
	<b>Total</b>	<b>0</b>	<b>Cannot be disclosed</b>	<b>379</b>
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Faroese (28 vessels), Norwegian (8 vessels), French (5 vessels), Dutch (5 vessels), German (4 vessels), Greenland (3 vessels), Danish (2 vessels), Irish (2 vessels), Spanish (1 vessel), Polish (1 vessel), Swedish (1 vessel).</li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Faroese (28 vessels), Norwegian (8 vessels), French (5 vessels), Dutch (5 vessels), German (4 vessels), Greenland (3 vessels), Danish (2 vessels), Irish (2 vessels), Spanish (1 vessel), Polish (1 vessel), Swedish (1 vessel).</li> </ul>
	Off-site	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>If activity is displaced rather than lost, there is potential for:               <ul style="list-style-type: none"> <li>Gear conflict</li> <li>Increased fishing pressure on species outside of the site</li> <li>Changes to vessel costs/revenues</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>If activity is displaced rather than lost, there is potential for:               <ul style="list-style-type: none"> <li>Gear conflict</li> <li>Increased fishing pressure on species outside of the site</li> <li>Changes to vessel costs/revenues</li> </ul> </li> </ul>
<b>Quantified Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive) (deriving from on-site impacts)</b>				
<b>Cost Impacts (£000s)</b>				
Total costs (2019–2038)		0	Cannot be disclosed	7,585
Average annual costs		0	Cannot be disclosed	379
Present value of total costs (2019–2038)		0	Cannot be disclosed	5,579

## Appendix C: Site Assessment Tables

<b>Economic Impacts</b>			
<b>Direct GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	4,323
Average annual change in GVA	0	Cannot be disclosed	216
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	3,180
<b>Direct + Indirect GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	6,260
Average annual change in GVA	0	Cannot be disclosed	313
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	4,604
<b>Direct, Indirect + Induced GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	7,034
Average annual change in GVA	0	Cannot be disclosed	352
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	5,174
<b>Employment (FTEs)</b>			
Direct and indirect reduction in employment	0.0	Cannot be disclosed	5.7
Direct, indirect and induced reduction in employment	0.0	Cannot be disclosed	6.2
<p>* On-site cost impacts may be offset by catches from effort displaced off-site, detailed in the assumptions.</p> <p>** Where the value of landings affected is less than 10% of the value from the site, less than 10% of the value from each ICES rectangle, or less than 1% of the value from the region, it is likely that this activity can be absorbed by other grounds in the pMPA, ICES rectangles or region as appropriate, and therefore no cost impact is anticipated.</p> <p>Definitions of cost and economic impacts:</p> <p>Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.</p> <p>Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).</p> <p>Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.</p> <p>Total change in GVA (2019–2038) = The change in GVA (direct/indirect/induced as appropriate) for commercial fisheries summed over the 20 year period.</p> <p>Average annual change to GVA = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries divided by the total number of years under analysis (i.e. 20).</p> <p>Present value of total change in GVA (2019–2038) = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries discounted to current value, using a discount rate of 3.5%.</p> <p>Direct, indirect reduction in Employment = The average (mean) reduction in direct employment in the sector in full-time equivalents (FTEs), and indirect reduction in employment on the sector's suppliers.</p> <p>Direct, indirect and induced reduction in employment = The average (mean) reduction in employment in the sector, the sector's suppliers and across the economy as a whole as a result of reduced expenditure by employees and suppliers.</p>			



## Appendix C: Site Assessment Tables

Table 3b: Oil and Gas				FSR
<p>There is some overlap between the assessed Faroe-Shetland reserve and oil and gas exploration. This includes 16 licensed blocks, 5 blocks from the 29<sup>th</sup> licensing, 28 blocks from the 30<sup>th</sup> licensing and 116 blocks from the 31<sup>st</sup> licensing rounds. These are shown in Figure C1. Since oil and gas activity could be conducted under the lower management scenario, the costs for the blocks that have the potential for oil and gas extraction have been estimated. In the assessed Faroe-Shetland reserve, there is one licensed block that has an undeveloped discovery located inside the block and two licensing round blocks that overlap with an undeveloped discovery and therefore have potential for oil and gas extraction. The costs of the additional assessments required for these blocks have been calculated in for the lower management scenario. Under the intermediate and upper management scenarios, no extraction can occur from the seabed and therefore, this represents an opportunity cost that cannot be quantified.</p>				
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)				
	Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts	<ul style="list-style-type: none"> <li>• New development proposals affecting MPAs will require additional assessment of impacts to protected features;</li> <li>• Additional assessment costs per licence application are estimated to be £5.6k (at 2019 prices);</li> <li>• Costs are incurred for one licensed block and two licensing blocks that overlap with an undeveloped discovery.</li> <li>• It is assumed that the licensed block and one of the two licensing blocks will progress to the Third term. The other licensing block will only proceed to the Second term.</li> <li>• Assessments are assumed to be required for geotechnical surveys, seismic surveys, exploration drilling and extraction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified.</li> </ul>	<ul style="list-style-type: none"> <li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified.</li> </ul>	
Description of quantified impacts - (on-site)	<p>Additional assessment costs for licence applications:</p> <ul style="list-style-type: none"> <li>• Geotechnical surveys (2021 during the Initial Term) (£16.8k).</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	

## Appendix C: Site Assessment Tables

		<ul style="list-style-type: none"> <li>• Seismic surveys (2024, mid-way through the Initial Term) (£16.8k)</li> <li>• Exploration drilling (2027, end of the Initial Term) (£16.8k)</li> <li>• Extraction activities inc. pipeline development (2038, middle of the Third Term) (£11.2k).</li> </ul>		
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"> <li>• Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone oil and gas extraction</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity costs of foregone oil and gas extraction</li> </ul>
	Off-site	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Future oil and gas activity displaced to areas outside of the reserves</li> </ul>
<b>Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)</b>				
<b>Cost Impacts (£000s)</b>				
Total costs (2019 to 2038)		62	0	0
Average annual costs		3	0	0
Present value of total costs (2019 to 2038)		48	0	0
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.				

## Appendix C: Site Assessment Tables

Table 3c: Power Interconnectors					FSR
There are no power interconnectors currently located within the assessed Faroe-Shetland reserve. There is one project identified for potential development over the assessment period (IceLink, which is currently in the feasibility stage of the project, which is expected to be in operation in 2025) which crosses the deep sea marine reserve. This project will require additional assessments to support planning applications (including marine licence) and regular survey to support operation and maintenance following construction. The proposed interconnector route is shown in Figure C1.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>It has been assumed that:<ul style="list-style-type: none"><li>the IceLink connection is the only proposed connection in the reserve during the assessment period</li><li>the additional assessment required to include MPA features is £5.6k for each application</li><li>additional assessment costs will be incurred in 2022</li></ul></li></ul>	<ul style="list-style-type: none"><li>It has been assumed that:<ul style="list-style-type: none"><li>the IceLink connection is the only proposed connection in the reserve during the assessment period</li><li>the additional assessment required to include MPA features is £5.6k for each application</li><li>additional assessment costs will be incurred in 2022</li></ul></li></ul>	<ul style="list-style-type: none"><li>It has been assumed that:<ul style="list-style-type: none"><li>the IceLink connection is the only proposed connection in the reserve during the assessment period</li><li>the additional assessment required to include MPA features is £5.6k for each application</li><li>additional assessment costs will be incurred in 2022</li></ul></li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k (in 2022).</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k (in 2022).</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k (in 2022).</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>Cost of uncertainty and delays to licence applications</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019 to 2038)		6	6	6	
Average annual costs		<1	<1	<1	
Present value of total costs (2019 to 2038)		5	5	5	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					

## Appendix C: Site Assessment Tables

Table 3d: Seabed Mining					FSR
There is no seabed mining occurring within the assessed Faroe-Shetland reserve. The UK's domestic EEZ is not expected to be able to support significant commercial interest as it is currently unknown if the UK harbours sufficient commercial-scale mineral deposits. However, heavy minerals have been identified in Scottish waters, close to the assessed Faroe-Shetland reserve and there may be potential for future exploitation. It is assumed that one application will be submitted towards the end of the assessment period in this reserve. However, under the intermediate and upper management scenarios, no seabed mining can occur. This represents an opportunity cost that cannot be quantified.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>• New development proposals affecting MPAs will require additional assessment of impacts to protected features</li><li>• Additional assessment costs per licence application are estimated to be £5.6k (at 2019 prices)</li><li>• It is assumed that one licence may be applied for at the end of the assessment period</li></ul>	<ul style="list-style-type: none"><li>• Seabed mining is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	<ul style="list-style-type: none"><li>• Seabed mining is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>• Cost of additional assessment for seabed mining projects transecting the site in 2038. Total cost = £5.6k.</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>• Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>• Opportunity costs of foregone mineral extraction</li></ul>	<ul style="list-style-type: none"><li>• Opportunity costs of foregone mineral extraction</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• Future seabed mining activity displaced to areas outside of the reserves</li></ul>	<ul style="list-style-type: none"><li>• Future seabed mining activity displaced to areas outside of the reserves</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019 to 2038)		6	0	0	
Average annual costs		<1	0	0	
Present value of total costs (2019 to 2038)		3	0	0	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.					

## Appendix C: Site Assessment Tables

Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).  
Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.

**Table 3e: Telecommunication Cables**

**FSR**

There are six telecommunication cables which transit the assessed Faroe-Shetland reserve, totalling approximately 587 km of length within the reserve. Telecom cables are shown in Figure C1. It is assumed existing telecom cables are designed with a lifespan of 25 years and the lifespan will be reached for these cables during the assessment period.

**Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)**

		Lower Estimate	Intermediate Estimate	Upper Estimate
Assumptions for impacts		<ul style="list-style-type: none"> <li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li> </ul>	<ul style="list-style-type: none"> <li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li> </ul>	<ul style="list-style-type: none"> <li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li> </ul>
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"> <li>Cost of additional assessment (£33.6k)</li> </ul>	<ul style="list-style-type: none"> <li>Cost of additional assessment (£33.6k)</li> </ul>	<ul style="list-style-type: none"> <li>Cost of additional assessment (£33.6k)</li> </ul>
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>
	Off-site	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

**Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)**

**Cost Impacts (£000s)**

Total costs (2019 to 2038)	34	34	34
Average annual costs	2	2	2
Present value of total costs (2019 to 2038)	25	25	25

Definitions of cost and economic impacts:

Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.

Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).

Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.

## Appendix C: Site Assessment Tables

### Human activities that would benefit from designation and management of the site as an MPA

Table 4. Human Activities that would Benefit from Designation and Management of the Site as an MPA				FSR
Activity	Description	Lower Estimate	Intermediate Estimate	Upper Estimate
Deep sea medicinal research	Protection of deep sea environments and species ensures future potential for scientific research to investigate benefits of deep sea organisms	Low		

### Human activities that would be unaffected by designation and management of the site as an MPA

Table 5. Human Activities that would be Unaffected by Designation and Management of the Site as an MPA				FSR
Activity	Description			
Aquaculture Finfish	There is no finfish aquaculture near to the site.			
Aquaculture Shellfish	There is no shellfish aquaculture near to the sites.			
Aviation	There is no interaction between aviation and the deep sea marine reserve			
Carbon Capture and Storage (CCS)	No CCS sites or potential pipelines near the site.			
Coast Protection and Flood Defence	There are no coastal and flood defences near to the site.			
Energy Generation	There are no current proposals for energy generation which would be affected by the deep sea marine reserve, and the uncertainty regarding future development is too high to conclude any impact within the study period.			
Marine Aggregates	There is currently no existing or planned marine aggregate extraction in Scottish waters			
Ports and Harbours	There are no ports and harbours situated near to the site.			
Recreational Boating	The potential management scenarios would have no impact on recreational boating in the region of the deep sea marine reserve.			
Shipping	The potential management scenarios would have no impact on commercial shipping in the region of the deep sea marine reserve.			
Tourism	The proposed sites are situated too far away from potential tourism sites.			
Water Sports	The potential management scenarios would have no impact on watersports in the region of the deep sea marine reserve.			

## Appendix C: Site Assessment Tables

### C.1.4 Social and Distributional Analysis of Impacts Arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 6a. Social Impacts Associated with Quantified and Non-Quantified Economic Impacts				FSR
Potential Economic Impacts	Area of Social Impact Affected	Mitigation	Significance of Social Impact	
x - xx	Employment in commercial fisheries (upper scenario)	None	x (upper scenario: xx)	
Impacts: xxx – significant negative effect; xx – possible negative effects; x – minimal negative effect, if any; 0 – no noticeable effect expected.				

Table 6b. Distribution of Social Impacts (Location, Age and Gender)									FSR
Sector/Impact	Scale of Impact by location			Age			Gender		
	Region	Ports*	Rural, Urban, Mainland or Island	Children	Working age	Pensionable Age	Male	Female	
Unemployment	North and South West (upper scenario: North and North East)	Home port: Ayr - 71% (<1%)	Rural	x	x	0	x	0	
Lower Income		Lochinver – 29% (<1%) Fraserburgh - 0% (34%) Peterhead - 0% (66%)  Landing port: Scrabster – 100% (<1%) Fraserburgh – 0% (22%) Peterhead – 0% (78%)	Rural	x	x	0	x	x	
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected.									
* The value of landings affected by home or landing port, as a percentage of all the landings affected, under intermediate estimate (upper estimate in brackets)									

## Appendix C: Site Assessment Tables

Table 6c. Distribution of Social Impacts (Fishing Groups, Income Groups and Social Groups)								FSR
Sector/Impact	Fishing Groups		Income Groups			Vulnerable Social Groups		
	Vessel Category <12 m >12 m	Gear Types/Sector	10% most deprived	Middle 80%	10% most affluent	Crofters	Ethnic minorities	With disability or long-term sick
Unemployment	>12 m	Set nets (upper: midwater trawls and surrounding nets).	x	x	x*	0	0	0
Lower Income			x	x	x*	0	0	0
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected.								
* Possible negative impact on upper income group under the upper scenario, but data on wages in the pelagic sector are not available to confirm this.								



## Appendix C: Site Assessment Tables

### C.1.5 Public Sector Costs

Table 7. Site/Feature-Specific Public Sector Costs arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 Inclusive)				FSR
Description	Public Sector Costs (Present value discounted over assessment period)			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Public Sector Costs (Present value, discounted over assessment period)</b>				
Preparation of Statutory Instruments	0	4.2	4.2	
De-designation of existing sites	4.2	4.2	4.2	
Site monitoring	749.4	749.4	749.4	
Compliance and enforcement	0	0	0	
Promotion of public understanding	0	0	0	
Regulatory and advisory costs associated with licensing decisions	8.2	3.1	3.1	
<b>Total Quantified Public Sector Costs</b>	<b>1,014.8</b>	<b>1,012.3</b>	<b>1,012.3</b>	
<b>Average annual costs</b>	<b>38.1</b>	<b>38.0</b>	<b>38.0</b>	
<b>Present value of total costs (2019 to 2038)</b>	<b>761.8</b>	<b>760.9</b>	<b>760.9</b>	

## C.1.6 Potential Contribution of the Site to an Ecologically-coherent Network

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FSR
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
Burrowed mud (including sea pens)	The pMPA provides the only representation of the feature within the deep sea marine reserve area. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	There are several sites within Scottish waters where burrowed muds are designated within MPAs <sup>6</sup> , including two that are on the boundary with the West of Scotland pMPA (Geikie Slide and Hebridean Slope MPA and The Barra Fan and Hebrides Terrace Seamount MPA).	The site has PMFs including sea pens and sea pen and burrowing megafauna communities (which are OSPAR species) and these provide functional links to other features within the deep sea marine reserve that are OSPAR species <sup>7</sup> .	Deep burrowed muds are almost exclusively found in the northern North Sea and from sea lochs in western Scotland and the Hebrides <sup>8</sup> . The pMPA reflects areas essential for this feature.	Burrowed mud can support communities and species such as sea pens and burrowing megafauna in circalittoral fine mud. Whilst additional representation may not be required, some of the supporting communities and species have low population levels for example, fireworks anemone are nationally scarce <sup>9</sup> . In addition, they support OSPAR species. Therefore, the site complements existing protection of dependent features, adding to resilience, and provides protection to OSPAR species.
Deep sea sponge aggregations	The proposal provides an area with important concentrations and quantities of sponges <sup>10</sup> . Whilst deep sea sponge aggregations are listed by	Several sites within or neighbouring the pMPA currently include deep sea sponge aggregations as a protected feature (Rosemary Bank	No information available.	The proposed site provides a good quality example of the feature to add to the integrity of the proposals and complement the existing protection where the feature	Deep sea sponge aggregations are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR

<sup>6</sup> JNCC. 2019. Marine Protected Areas in the UK map. Available at: <http://jncc.defra.gov.uk/page-5201>. [Accessed on 05/02/2019]

<sup>7</sup> Doggett, M., Baldock, B. & Goudge, H. (2018). A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>8</sup> Marine Scotland. 2018. Burrowed mud. Available at: <http://marine.gov.scot/information/burrowed-mud>. [Accessed on 05/02/2019]

<sup>9</sup> Marine Scotland. 2018. Burrowed mud. Available at: <http://marine.gov.scot/information/burrowed-mud>. [Accessed on 05/02/2019]

<sup>10</sup> JNCC. 2014. Faroe-Shetland sponge belt nature conservation MPA. Available at: [http://jncc.defra.gov.uk/pdf/Faroe-Shetland\\_Sponge\\_Belt\\_Application\\_of\\_the\\_MPA\\_Selection\\_Guidelines\\_v5\\_0.pdf](http://jncc.defra.gov.uk/pdf/Faroe-Shetland_Sponge_Belt_Application_of_the_MPA_Selection_Guidelines_v5_0.pdf). [Accessed on 05/02/2019]

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FSR
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
	OSPAR, it is considered that there is a high risk to deep sea sponge aggregations <sup>11</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Seamount and particularly the Faroe Shetland Sponge Belt) <sup>12</sup> .		is considered to be have a high risk in the OSPAR region II <sup>13</sup> .	Commission in neighbouring regions <sup>14</sup> and at high risk in Region II <sup>15</sup> . Though there are designated sites with the feature listed, there is currently a lack of management within these sites to protect the species. Deep sea sponge aggregations are also designated as a Vulnerable Marine Ecosystem.
Offshore deep sea muds	Representative of Scotland's continental slope habitat and deep sea floor <sup>16</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Several sites within or near the pMPA currently have offshore deep sea muds as a designated feature (Barra Fan and Hebrides Terrace Seamount; Geikie Slide and Hebridean Slope; North-east Faroe-Shetland Channel) <sup>17</sup> .	This habitat provides a variety of functional links with several features and adds to the integrity of these proposals and complements the existing protection throughout the sites found in the pMPA. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>18</sup> .	Deep sea muds are mainly present in the deeper sections of the Faroe-Shetland Channel and the Rockall Trough and along continental slope habitats. Deep sea muds vary throughout the pMPA, dependent on the depth, substrate, topography / current regime and temperature; variations in	Additional representation not required to achieve resilience, however the site complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>20</sup> .

<sup>11</sup> JNCC. 2013. Scottish MPA Project Assessment against the MPA Selection Guidelines. Faroe-Shetland sponge belt possible MPA. Available at: [http://jncc.defra.gov.uk/pdf/SMFA\\_Faroe\\_Sheland\\_Sponge\\_Belt%20\\_Application\\_of\\_the\\_MPA\\_Selection\\_Guidelines\\_July2013.pdf](http://jncc.defra.gov.uk/pdf/SMFA_Faroe_Sheland_Sponge_Belt%20_Application_of_the_MPA_Selection_Guidelines_July2013.pdf)

<sup>12</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>13</sup> JNCC. 2013. Ibid.

<sup>14</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

<sup>15</sup> JNCC. 2013. Ibid.

<sup>16</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>17</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>18</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>20</sup> Doggett, M. *et al.* 2018. Ibid.

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FSR
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
				mud coarseness support different communities <sup>19</sup> .	
Offshore subtidal sands and gravels	Representative of Scotland's continental slope habitat and deep sea floor <sup>21</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Several sites have been designated for this feature within or near the pMPA: North-east Faroe-Shetland Channel, Faroe Shetland Sponge Belt and the Geikie Slide and Hebridean Slope <sup>22</sup> .	This habitat provides a variety of functional links with several features and adds to the integrity of these proposals and complements the existing protection throughout the sites found in the deep sea marine reserve. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>23</sup> .	The pMPA provides a good quality example of the feature to add to the integrity of the proposals and complements the existing protection in several sites already designated in the deep sea reserve area. There are important variations in gravel coarseness throughout the reserve, dependent on the depth, substrate, topography / current regime and temperature; variations in coarseness support different communities <sup>24</sup> .	Additional representation not required to achieve resilience, however the site complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>25</sup> .

<sup>19</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>21</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>22</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>23</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>24</sup> Doggett, M. *et al.* 2018. Ibid.

<sup>25</sup> Doggett, M. *et al.* 2018. Ibid.

## Appendix C: Site Assessment Tables

Table 9a. Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									FSR
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Benefits	Confidence
				Lower	Intermediate	Upper			
Fish and shellfish for human consumption	Moderate, important spawning sites <sup>26</sup>	On-site and off-site	Many stocks' biomass are not at MSY	Nil	Deep sea species to benefit from protection	Moderate, spawning areas for commercial species such as anglerfish and key habitats e.g. for elasmobranchs	Low	Low	
Fish and shellfish for non-human consumption			Stocks reduced from potential maximum						
Climate regulation	Moderate - high, carbon storage in deep sea habitats	On-site	Uncertain but potentially important services	Minimal			Moderate	Minimal	Moderate
Waste breakdown/detoxification	Low	On-site	Low - moderate	Minimal			Low	Minimal	Low
Non-use value of natural environment	Moderate, deep sea features (e.g. sponges) and sites have non-use value	On-site	Non-use value of the site may decline	Moderate, protection of features of site from potential future decline			Low–Moderate, protection of features is valued by non-users	Moderate	Moderate, extent of features, and value to society all uncertain
Research and Education	Moderate, a number of biological features have research value, such as deep sea species <sup>27</sup>	On-site	Value of site may decline	Low, protection of key characteristics of site from decline, improving future research opportunities			Moderate	Low - Moderate	Low, extent to which research uses site in future uncertain.
Genetic Resources									
Supporting services	High	On-site and off-site	Moderate	Designation and management reduces risks of future decline			Moderate	Low	Moderate
Total value of changes in ecosystem services		On site & off-site	Moderate	Low - Moderate				Low - moderate	Low

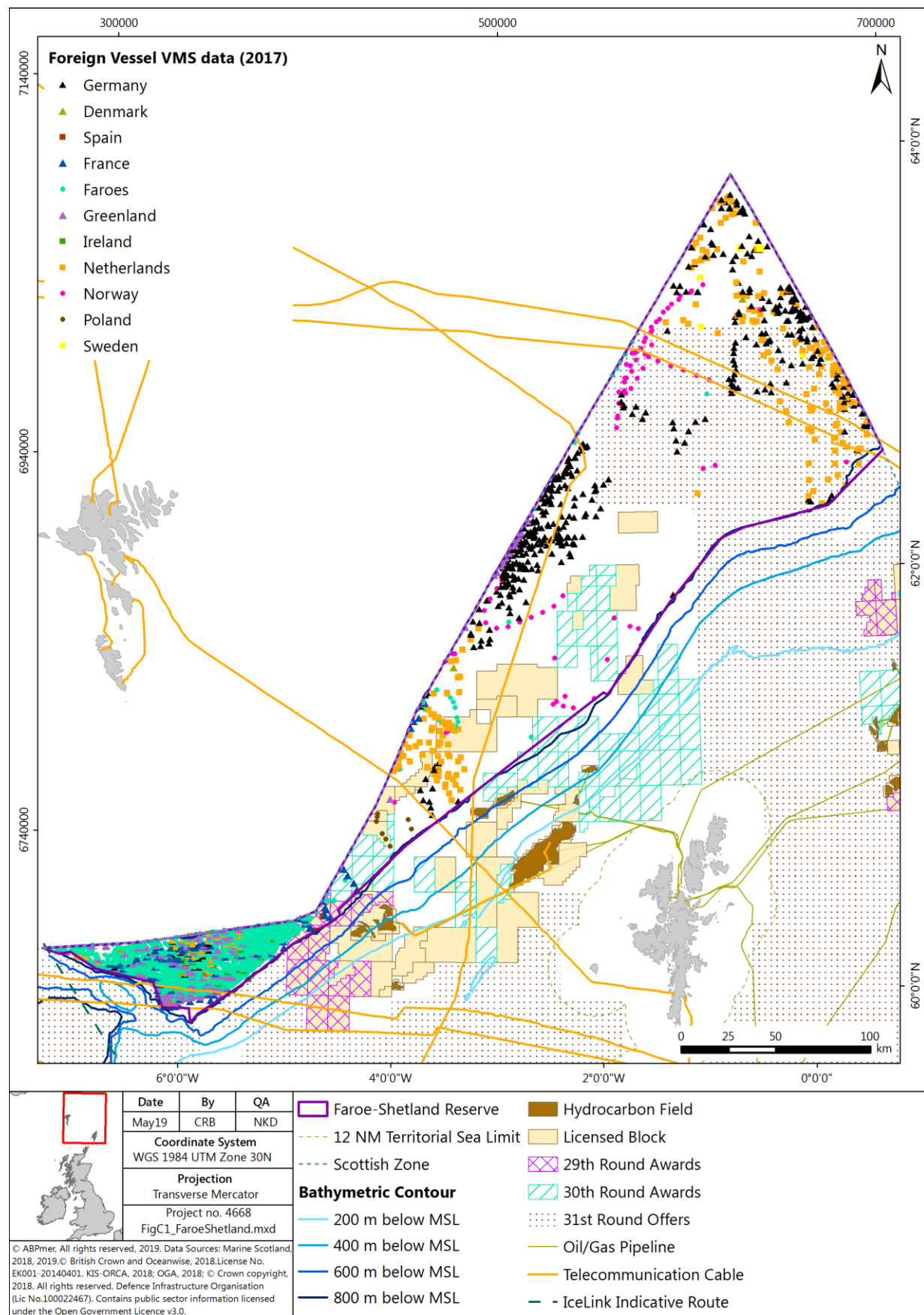
<sup>26</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>27</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

## Appendix C: Site Assessment Tables

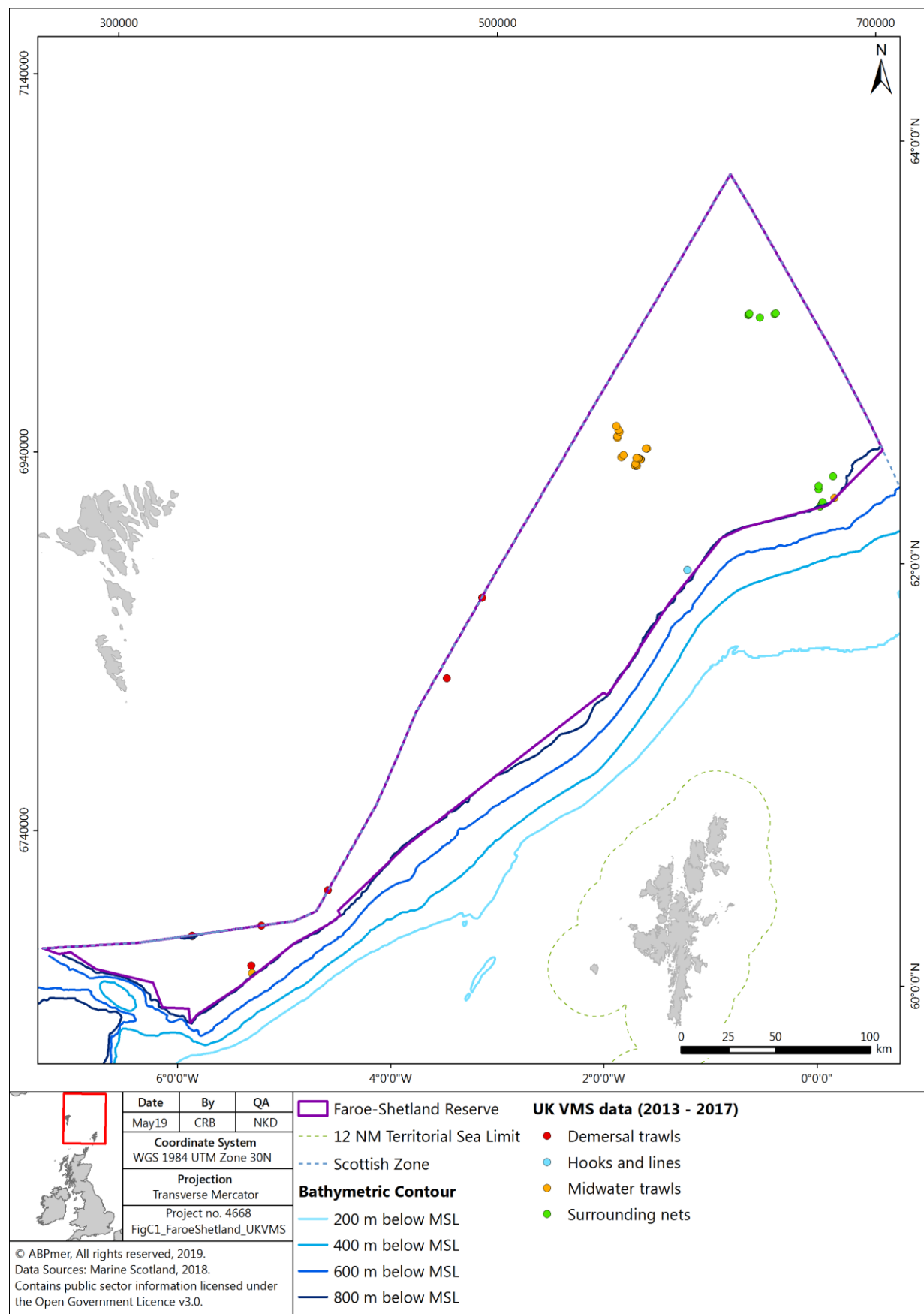
Table 9b. Summary of Ecosystem Services Costs arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)								FSR	
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Costs	Confidence
				Lower	Intermediate	Upper			
No costs are expected to arise. The scale of fisheries impacts is considered to be too small for changes in fishing gear to occur, or for displacement of fishing effort to have any noticeable impacts on ecosystem services outside the site.									
Total value of changes in ecosystem services				Nil					High

## Appendix C: Site Assessment Tables



**Figure C1 All sector activities in the assessed Faroe-Shetland reserve (excluding UK commercial fisheries)**

## Appendix C: Site Assessment Tables



**Figure C2 Commercial fisheries VMS data for the assessed Faroe-Shetland reserve (UK vessels)**



## C.2 West of Scotland Reserve (WSR)

### C.2.1 Site/Feature Summary

Site Extent (km<sup>2</sup>): 107,773

Table 1. Summary of Proposed Protected Features, Data Confidence and Conservation Objectives	WSR
<p><b>Protected features</b></p> <p>The proposed West of Scotland reserve encompasses many biodiversity features, listed below. The site hosts deep waters (down to 2000m), seamounts and slope habitats. Atlantic-influenced offshore deep sea muds and subtidal sands and gravels provide important functional links with Priority Marine Features, which are proposed to be designated in this site, including cold-water coral reefs, coral gardens and deep sea sponge aggregations. These features are considered to be of functional significance, through e.g. biogeochemical cycling and supporting an assemblage of finer resolution habitats and species<sup>28</sup>. The pMPA hosts important aggregations of various deep sea sponge species<sup>29</sup>. Burrowed muds provide important habitat, contributing to food web dynamics between burrowing species (such as squat lobsters) and benthic-feeding commercial fish species<sup>30</sup>. ICES has listed cold-water coral reefs as a VME and several of the features proposed below are listed as declining or threatened by OSPAR in the region (such as deep sea sponge aggregations<sup>31</sup>, leafscale gulper shark, Portuguese dogfish and orange roughy<sup>32</sup>). Blue Ling are a commercially-important species to the deep sea marine reserve and the pMPA acts as a significant proportion of the species range, including its spawning areas<sup>33</sup>. The site forms an important area for orange roughy, which is listed as a threatened or declining species by OSPAR for the region. They concentrate on steep slopes, summits, rocky outcrops, canyons and carbonate mounds of the area are particularly vulnerable to fishing in the site as they aggregate during spawning<sup>34</sup>. Roundnose grenadier are a commercially important species and the area provides important foraging areas for the species<sup>35</sup>.</p>	

<sup>28</sup> Doggett, M., Baldock, B. & Goudge, H. (2018). A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091

<sup>29</sup> Howell, K., Piechaud, N., Downie, A., Kenny, A., The distribution of deep-sea sponge aggregations in the North Atlantic and implications for their effective spatial management Deep-Sea Research Part I, 115, pp. 309-320.

<sup>30</sup> Doggett, M., Baldock, B. & Goudge, H. (2018). A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091

<sup>31</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

<sup>32</sup> Priede, I.G. (2018) Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>33</sup> Priede, I.G. (2018) Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>34</sup> Priede, I.G. (2018) Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>35</sup> Priede, I.G. (2018) Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

## Appendix C: Site Assessment Tables

Summary of confidence in presence, extent and condition of protected features and conservation objectives					
Protected Feature	Estimated Area of Feature (km <sup>2</sup> ) or Number of Individuals	Confidence in Feature Presence	Confidence in Feature Extent	Confidence in Feature Condition	Conservation Objective
<b>Biodiversity Features</b>					
Burrowed mud (including Seapens)	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Coral gardens	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Cold-water coral reefs (including <i>Lophelia pertusa</i> reefs)	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
Deep sea sponge aggregations	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Offshore deep sea muds	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Offshore subtidal sands and gravels	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Seamount communities	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
Seamounts	N/A <sup>a</sup>	Yes	Yes	Favourable (uncertain)	Conserve
Blue Ling ( <i>Molva dypterygia</i> )	Biomass well above B <sub>MSY</sub> Trigger in subareas 6–7 and Division 5.b <sup>36</sup>	Yes	Yes	Favourable (uncertain)	Conserve
Leafscale gulper shark ( <i>Centrophorus squamosus</i> ) / Gulper shark ( <i>Centrophorus granulosus</i> )	Endangered. Unknown stock status but survey index shows recent increases in abundance <sup>37</sup> .	Yes	Partial	Uncertain	Conserve

<sup>36</sup> ICES. 2019. Blue ling (*Molva dypterygia*) in subareas 6–7 and Division 5.b (Celtic Seas, English Channel, and Faroes grounds). Published 7 June 2018 Available at: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/bli-5b67.pdf>

<sup>37</sup> ICES. 2018. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–28 June 2018, Lisbon, Portugal. ICES CM 2018/ACOM:16. 1306 pp.

## Appendix C: Site Assessment Tables

Orange roughy ( <i>Hoplostethus atlanticus</i> )	Below possible reference points <sup>38</sup>	Yes	Partial	Uncertain	Conserve
Portuguese dogfish ( <i>Centroscymnus coelolepis</i> )	Endangered. Unknown stock status but survey index shows no abundance trend <sup>39</sup> .	Yes	Partial	Uncertain	Conserve
Roundnose grenadier ( <i>Coryphaenoides rupestris</i> )	Endangered. Population size is unknown <sup>40,41</sup>	Yes	Partial	Uncertain	Conserve
<b>Key:</b> <sup>a</sup> Biodiversity habitat feature data is from point sources therefore an estimate of the area of features is not available.					

<sup>38</sup> ICES. 2016. Orange roughy (*Hoplostethus atlanticus*) in the Northeast Atlantic. Published 3 June 2016. Available at: <http://ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ory-comb.pdf>

<sup>39</sup> ICES. 2018. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–28 June 2018, Lisbon, Portugal. ICES CM 2018/ACOM:16. 1306 pp.

<sup>40</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 1, 2, 4, 8, and 9, Division 14.a, and in subdivisions 14.b.2 and 5.a.2 (Northeast Atlantic and Arctic Ocean). Published 7 June 2017.

<sup>41</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 6 and 7 and divisions 5.b and 12.b (Celtic Seas and the English Channel, Faroes grounds, and western Hatton Bank). Published 7 June 2018.

## Appendix C: Site Assessment Tables

### C.2.2 Summary of Costs and Benefits

Table 2. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)				WSR
Human Activity	Cost Impact on Activity			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Economic Costs (Discounted)</b>				
Commercial Fisheries (GVA)	0	1,124	5,646	
Oil and Gas	14	0	0	
Power Interconnectors	0	0	0	
Seabed Mining	0	0	0	
Telecommunication Cables	9	9	9	
<b>Total Quantified Economic Costs</b>	<b>23</b>	<b>9</b>	<b>9</b>	
<b>Total Quantified Economic Costs (GVA)</b>	<b>0</b>	<b>1,124</b>	<b>5,646</b>	
<b>Non-Quantified Economic Costs</b>				
Commercial fisheries	None	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (60 vessels), Irish (24 vessels), Faroese (23 vessels), French (12 vessels), Dutch (6 vessels), German (5 vessels), Danish (4 vessels), Spanish (3 vessels), Lithuanian (3 vessels), Polish (1 vessel).</li> <li>If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>Gear conflict.</li> <li>Increased fishing pressure on species outside of the site.</li> <li>Changes to vessel costs/revenue</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (60 vessels), Irish (24 vessels), Faroese (23 vessels), French (12 vessels), Dutch (6 vessels), German (5 vessels), Danish (4 vessels), Spanish (3 vessels), Lithuanian (3 vessels), Polish (1 vessel).</li> <li>If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>Gear conflict.</li> <li>Increased fishing pressure on species outside of the site.</li> <li>Changes to vessel costs/revenue</li> </ul> </li> </ul>	
Oil and Gas	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone oil and gas extraction</li> <li>Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone oil and gas extraction</li> <li>Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	
Seabed mining	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone mineral extraction</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone mineral extraction</li> </ul>	
Telecommunication cables	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	
<b>Note:</b> For detailed information on economic cost impacts on activities, see Table 3.				

## Appendix C: Site Assessment Tables

### C.2.3 Human Activity Summaries

#### Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 3a: Commercial fisheries	WSR
<p>The proposed West of Scotland reserve lies within ICES Division 6a, 6b and 5b. Approximately 53,000 tonnes (landed weight) of fish and shellfish were landed by UK vessels per annum from the ICES rectangles that the site overlaps<sup>42</sup> (2013-2017), over 90% were pelagic species by weight.</p> <p>Figure C4 shows that the main gear types used by UK over-12m vessels between 2013 and 2017 in the proposed West of Scotland reserve were predominantly midwater trawls, set nets and demersal trawls. Midwater trawls and demersal trawls operate along the south-eastern shelf edge (with demersal trawls along the 800m contour in places where the proposed reserve boundary does not consistently follow the 800m contour), set nets operate on Rockall Rise (located in the north-western part of the proposed reserve) in water less than 600m depth, and there are some scattered demersal trawl pings in the southern half of the reserve (Figure C4). The value of landings from the proposed reserve was £690,300 (from VMS data) (annual average for 2013–2017, 2019 prices). Approximately 10% of these landings have already been excluded or will be excluded from proposed management measures (e.g. CFP prohibition on trawling below 800m, management measures in Rosemary Bank Seamount NCMPS).</p> <p>Scotmap data indicate that under-15m vessels do not fish in the proposed reserve but Marine Scotland ICES rectangle landings data show that there have been a small amount of landings caught from an ICES rectangle that borders the north-eastern area in the proposed reserve, by under-10m vessels using pots. It is unclear if these landings were caught inside the reserve as the landings data are not recorded at a fine enough resolution. However, it is considered unlikely that these landings were caught inside the proposed reserve because of the depth of water inside the proposed reserve and its remoteness from land. Ultimately, very few recorded landings originate from the proposed West of Scotland reserve and further landings of the species caught in the area are likely to be further limited given the recent regulations put in place.</p> <p>VMS ping data indicate that the main non-UK vessels fishing in the proposed West of Scotland reserve include Norway, Ireland, Faroe Islands and France (Figure C3). It is not clear which gear types were used by these vessels and no information on landings is available, therefore it is not possible to estimate costs for the intermediate or upper scenarios. Previous studies show that the main gear types used by Germany in the Rosemary Bank include lines<sup>43</sup>, however, there are a lack of data to show what fishing gear is used in the other fleets. The Norwegian vessels appear to concentrate effort on the south-eastern slopes of the reserve; German vessels were almost exclusively concentrated around and over the Rosemary Bank; French vessels were concentrated around the south-eastern and north-eastern slopes at the edge of the reserve. Faroese vessels were located throughout the reserve but generally found in the north-eastern boundary and south-eastern slopes of the reserve. Overall non-UK effort was focused along the eastern slope and Rosemary Bank.</p> <p>UK vessels fishing in the proposed West of Scotland reserve predominantly operate from Peterhead and Lerwick. Landings were made predominantly into Peterhead (50 %), Skaagen (Denmark) (33 %) and Hantsholm (Denmark) (11 %).</p>	

<sup>42</sup> Note that these figures include areas within the ICES rectangles that lie outside of the proposed reserve boundaries.

<sup>43</sup> Marine Scotland. 2015. Final Business and Regulatory Impact Assessment. Available at: <https://www2.gov.scot/Resource/0045/00456448.pdf>

## Appendix C: Site Assessment Tables

Although the values for individual gear types cannot be disclosed, the impact under the intermediate scenario predominantly falls on set nets and lines, and under the upper scenario predominantly falls on midwater trawls and set nets.				
Economic Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive)				
		Lower Estimate	Intermediate Estimate	Upper Estimate
Assumptions for impacts		<ul style="list-style-type: none"> <li>Designation as an MPA with existing management</li> </ul>	<ul style="list-style-type: none"> <li>Exclusion of all demersal mobile and static gears</li> <li>It is assumed that hook and line gears on Rosemary Bank Seamount are managed through the measures for that MPA</li> <li>It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>	<ul style="list-style-type: none"> <li>Exclusion of all demersal and pelagic static and mobile gears</li> <li>It is assumed that hook and line gears on Rosemary Bank Seamount are managed through the measures for that MPA</li> <li>It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>
Description of quantified impacts – cost impacts per fleet segment (annual values, £000s, 2019 prices) (on-site)*	<b>Over-12m vessels</b>	<ul style="list-style-type: none"> <li>Loss of fishing income:</li> </ul>	<ul style="list-style-type: none"> <li>Loss of fishing income:</li> </ul>	<ul style="list-style-type: none"> <li>Loss of fishing income:</li> </ul>
	Demersal trawls and seines, lines and set nets	0	149	149
	Midwater trawls	0	0	472
	<b>Total all vessels</b>	<b>0</b>	<b>149</b>	<b>621</b>
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (60 vessels), Irish (24 vessels), Faroese (23 vessels), French (12 vessels), Dutch (6 vessels), German (5 vessels), Danish (4 vessels), Spanish (3 vessels), Lithuanian (3 vessels), Polish (1 vessel).</li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (60 vessels), Irish (24 vessels), Faroese (23 vessels), French (12 vessels), Dutch (6 vessels), German (5 vessels), Danish (4 vessels), Spanish (3 vessels), Lithuanian (3 vessels), Polish (1 vessel).</li> </ul>

## Appendix C: Site Assessment Tables

	Off-site	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• If activity is displaced rather than lost, there is potential for:               <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> <li>○ Changes to vessel costs/revenue</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• If activity is displaced rather than lost, there is potential for:               <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> <li>○ Changes to vessel costs/revenue</li> </ul> </li> </ul>
<b>Quantified Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive) (deriving from on-site impacts)</b>				
<b>Cost Impacts (£000s)</b>				
Total costs (2019–2038)	0	2,982	12,424	
Average annual costs	0	149	621	
Present value of total costs (2019–2038)	0	2,193	9,138	
<b>Economic Impacts</b>				
<b>Direct GVA (£000s)</b>				
Total change in GVA (2019–2038)	0	1,529	7,677	
Average annual change in GVA	0	76	384	
Present value of total change in GVA (2019–2038)	0	1,124	5,646	
<b>Direct + Indirect GVA (£000s)</b>				
Total change in GVA (2019–2038)	0	2,213	11,115	
Average annual change in GVA	0	111	556	
Present value of total change in GVA (2019–2038)	0	1,628	8,175	
<b>Direct, Indirect + Induced GVA (£000s)</b>				
Total change in GVA (2019–2038)	0	2,487	12,490	
Average annual change in GVA	0	124	624	
Present value of total change in GVA (2019–2038)	0	1,829	9,186	
<b>Employment (FTEs)</b>				
Direct and indirect reduction in employment	0.0	2.3	9.4	
Direct, indirect and induced reduction in employment	0.0	2.4	10.2	

## Appendix C: Site Assessment Tables

\* On-site cost impacts may be offset by catches from effort displaced off-site, detailed in the assumptions.

\*\* Where the value of landings affected is less than 10% of the value from the site, less than 10% of the value from each ICES rectangle, or less than 1% of the value from the region, it is likely that this activity can be absorbed by other grounds in the pMPA, ICES rectangles or region as appropriate, and therefore no cost impact is anticipated.

Definitions of cost and economic impacts:

Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.

Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).

Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.

Total change in GVA (2019–2038) = The change in GVA (direct/indirect/induced as appropriate) for commercial fisheries summed over the 20 year period.

Average annual change to GVA = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries divided by the total number of years under analysis (i.e. 20).

Present value of total change in GVA (2019–2038) = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries discounted to current value, using a discount rate of 3.5%.

Direct, indirect reduction in Employment = The average (mean) reduction in direct employment in the sector in full-time equivalents (FTEs), and indirect reduction in employment on the sector's suppliers.

Direct, indirect and induced reduction in employment = The average (mean) reduction in employment in the sector, the sector's suppliers and across the economy as a whole as a result of reduced expenditure by employees and suppliers.



## Appendix C: Site Assessment Tables

Table 3b: Oil and Gas			WSR	
There is some overlap between the West of Scotland marine reserve and oil and gas exploration. This includes 3 licensed blocks, 5 blocks from the 29 <sup>th</sup> licensing and 505 blocks from the 31 <sup>st</sup> licensing round. These are shown in Figure C3. Since oil and gas activity could be conducted under the lower management scenario, the costs for the blocks that have the potential for oil and gas extraction have been estimated. In the proposed West of Scotland reserve, there is one licensed block that has an undeveloped discovery located inside the block (licence number 2138 with undeveloped discovery number 154/01- 1). The costs of the additional assessments required for this block have been calculated in for the lower management scenario. Under the intermediate and upper scenarios, no oil and gas extraction would be permitted; this represents an opportunity cost to the industry that cannot be quantified.				
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)				
		Lower Estimate	Intermediate Estimate	Upper Estimate
Assumptions for impacts		<ul style="list-style-type: none"><li>• New development proposals affecting MPAs will require additional assessment of impacts to protected features</li><li>• Additional assessment costs per licence application are estimated to be £5.6k (at 2019 prices)</li><li>• Costs are incurred for one licensed block that overlaps with an undeveloped discovery</li><li>• It is assumed that the licensed block in the West of Scotland reserve will not proceed to the Third term given how remote the site is from current oil and gas infrastructure</li><li>• Assessments are assumed to be required for geotechnical surveys, seismic surveys and exploration drilling</li></ul>	<ul style="list-style-type: none"><li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	<ul style="list-style-type: none"><li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>
Description of quantified impacts - (on-site)		Additional assessment costs for licence applications: <ul style="list-style-type: none"><li>• Geotechnical surveys (2021 during the Initial Term) (£5.6k)</li><li>• Seismic surveys (2024, mid-way through the Initial Term) (£5.6k)</li><li>• Exploration drilling (2027, end of the Initial Term) (£5.6k)</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>• Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>• Opportunity costs of foregone oil and gas extraction</li></ul>	<ul style="list-style-type: none"><li>• Opportunity costs of foregone oil and gas extraction</li></ul>
	Off-site	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• Future oil and gas activity displaced to areas outside of the reserves</li></ul>	<ul style="list-style-type: none"><li>• Future oil and gas activity displaced to areas outside of the reserves</li></ul>

## Appendix C: Site Assessment Tables

Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)			
Cost Impacts (£000s)			
Total costs (2019 to 2038)	17	0	0
Average annual costs	1	0	0
Present value of total costs (2019 to 2038)	14	0	0
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

## Appendix C: Site Assessment Tables

Table 3c: Seabed Mining					WSR
There is no seabed mining occurring within the West of Scotland deep sea marine reserve. The UK's domestic EEZ is not expected to be able to support significant commercial interest as it is currently unknown if the UK harbours sufficient commercial-scale mineral deposits. However, heavy minerals have been identified in Scottish waters, close to the assessed Faroe-Shetland reserve and there may be potential for future exploitation. It is assumed that one application will be applied for towards the end of the assessment period within the assessed Faroe-Shetland reserve, and there will be no applications within the West of Scotland reserve.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>It is assumed that no seabed mining will occur in the West of Scotland reserve throughout the assessment period, given the lack of infrastructure and accessibility of available minerals.</li></ul>	<ul style="list-style-type: none"><li>Seabed mining activity is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	<ul style="list-style-type: none"><li>Seabed mining activity is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>Opportunity costs of foregone mineral extraction</li></ul>	<ul style="list-style-type: none"><li>Opportunity costs of foregone mineral extraction</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>Future seabed mining activity displaced to areas outside of the reserves</li></ul>	<ul style="list-style-type: none"><li>Future seabed mining activity displaced to areas outside of the reserves</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019 to 2038)		0	0	0	
Average annual costs		0	0	0	
Present value of total costs (2019 to 2038)		0	0	0	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					

## Appendix C: Site Assessment Tables

Table 3d: Telecommunication Cables					WSR
There are two telecommunication cables which transit the proposed West of Scotland reserve, totalling approximately 876 km of length within the reserve. Telecom cables are shown in Figure C3. It is assumed existing telecom cables are designed with a lifespan of 25 years and the lifespan will be reached for both of these cables during the assessment period.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables that need replacing will be replaced in the following years: ATLANTIC CROSSING 1 to be replaced in 2024 and TAT 14 to be replaced in 2026.</li></ul>	<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables that need replacing will be replaced in the following years: ATLANTIC CROSSING 1 to be replaced in 2024 and TAT 14 to be replaced in 2026.</li></ul>	<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables that need replacing will be replaced in the following years: ATLANTIC CROSSING 1 to be replaced in 2024 and TAT 14 to be replaced in 2026.</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>Cost of additional assessment (£11.2k)</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment (£11.2k)</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment (£11.2k)</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019 to 2038)		11	11	11	
Average annual costs		1	1	1	
Present value of total costs (2019 to 2038)		9	9	9	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					

## Appendix C: Site Assessment Tables

### Human activities that would benefit from designation and management of the site as an MPA

Table 4. Human Activities that would Benefit from Designation and Management of the Site as an MPA				WSR
Activity	Description	Lower Estimate	Intermediate Estimate	Upper Estimate
Deep sea medicinal research	Protection of deep sea environments and species provides potential for scientific research to investigate benefits of deep sea organisms	Low		

### Human activities that would be unaffected by designation and management of the site as an MPA

Table 5. Human Activities that would be Unaffected by Designation and Management of the Site as an MPA				WSR
Activity	Description			
Aquaculture Finfish	There is no finfish aquaculture near to the sites.			
Aquaculture Shellfish	There is no shellfish aquaculture near to the sites.			
Aviation	There is no interaction between aviation and the deep sea marine reserve			
Carbon Capture and Storage (CCS)	No CCS sites or potential pipelines near the site.			
Coast Protection and Flood Defence	There are no coastal and flood defences near to the site.			
Energy Generation	There are no current proposals for energy generation which would be affected by the deep sea marine reserve, and the uncertainty regarding future development is too high to conclude any impact within the study period.			
Marine Aggregates	There is currently no existing or planned marine aggregate extraction in Scottish waters			
Ports and Harbours	There are no ports and harbours situated near to the site.			
Recreational Boating	The potential management scenarios would have no impact on recreational boating in the region of the deep sea marine reserve.			
Shipping	The potential management scenarios would have no impact on commercial shipping in the region of the deep sea marine reserve.			
Tourism	The proposed sites are situated too far away from potential tourism sites.			
Water Sports	The potential management scenarios would have no impact on watersports in the region of the deep sea marine reserve.			

## Appendix C: Site Assessment Tables

### C.2.4 Social and Distributional Analysis of Impacts Arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 6a. Social Impacts Associated with Quantified and Non-Quantified Economic Impacts				WSR
Potential Economic Impacts	Area of Social Impact Affected	Mitigation	Significance of Social Impact	
x - xx	Employment in commercial fisheries (upper scenario)	None	x (upper scenario: xx)	
Impacts: xxx – significant negative effect; xx – possible negative effects; x – minimal negative effect, if any; 0 – no noticeable effect expected.				

Table 6b. Distribution of Social Impacts (Location, Age and Gender)									WSR
Sector/Impact	Scale of Impact by location			Age			Gender		
	Region	Ports*	Rural, Urban, Mainland or Island	Children	Working age	Pensionable Age	Male	Female	
Unemployment	North East, North-east England, (upper also: Orkney)	Home: North Shields – 77% (19%) Fraserburgh – 22% (13%) Mallaig – <1% (<1%) Lerwick – <1% (30%) Peterhead – 0% (38%)	Rural	x	x	0	x	0	
Lower Income			Rural	x	x	0	x	X	
	Impacts on landings ports also in North and North West	Landing: Ullapool – 27% (6%) Kinlochbervie – 22% (5%) Abroad – 44% (41%) Londonderry – 7% (2%) Scrabster – 1% (<1%) Fraserburgh – <1% (5%) Scalloway and Isles – <1% (<1%) Lerwick – 0% (5%) Peterhead – 0% (36%)							
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected.									
* The value of landings affected by home or landing port, as a percentage of all the landings affected, under intermediate estimate (upper estimate in brackets)									

## Appendix C: Site Assessment Tables

Table 6c. Distribution of Social Impacts (Fishing Groups, Income Groups and Social Groups)								WSR
Sector/Impact	Fishing Groups		Income Groups			Vulnerable Social Groups		
	Vessel Category <12 m >12 m	Gear Types/Sector	10% most deprived	Middle 80%	10% most affluent	Crofters	Ethnic minorities	With disability or long-term sick
Unemployment	>12 m	Set nets, demersal trawls (upper scenario also midwater trawls).	x	x	x*	0	0	0
Lower Income			x	x	x*	0	0	0
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected.								
* Possible negative impact on upper income group under the upper scenario, but data on wages in the pelagic sector are not available to confirm this.								

## Appendix C: Site Assessment Tables

### C.2.5 Public Sector Costs

Table 7. Site/Feature-Specific Public Sector Costs arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 Inclusive)				WSR
Description	Public Sector Costs (Present value discounted over assessment period)			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Public Sector Costs (Present value, discounted over assessment period)</b>				
Preparation of Statutory Instruments	0	4.2	4.2	
De-designation of existing sites	4.2	4.2	4.2	
Site monitoring	2,471.5	2,471.5	2,471.5	
Compliance and enforcement	0	0	0	
Promotion of public understanding	0	0	0	
Regulatory and advisory costs associated with licensing decisions	2.3	0.9	0.9	
<b>Total Quantified Public Sector Costs</b>	<b>3,307.0</b>	<b>3,309.5</b>	<b>3,309.5</b>	
<b>Average annual costs</b>	<b>123.9</b>	<b>124.0</b>	<b>124.0</b>	
<b>Present value of total costs (2019 to 2038)</b>	<b>2,478.0</b>	<b>2,480.8</b>	<b>2,480.8</b>	



## C.2.6 Potential Contribution of the Site to an Ecologically-coherent Network

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					WSR
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
Cold-water coral reefs (including <i>Lophelia pertusa</i> reefs)	Provides representation of OSPAR listed feature. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Cold-water coral reefs are protected in both Anton Dohrn Seamount SAC and East Rockall Bank SAC <sup>44</sup> . <i>Lophelia pertusa</i> has been protected in Darwin Mounds <sup>45</sup> .	<i>Lophelia pertusa</i> are shown to seed a metapopulation in larger areas around Scottish waters <sup>46</sup> and there is potential for long distance dispersal <sup>47</sup> .	Cold-water corals are found throughout the world's oceans, with a range from 55°S to 70°N in water temperatures between 4–8°C. The majority of cold-water corals are found beyond the shelf break around the Northeast Atlantic and off the UK, mainly on the continental slopes of west Scotland and Ireland <sup>48</sup> .	<i>Lophelia pertusa</i> are considered to have a 'very low resilience' <sup>49</sup> , are listed by OSPAR as a threatened or declining species and biogenic reefs under the EU Habitats Directive. Cold water coral reefs are defined as Annex I listed 'reef' habitat under the Habitat Directive <sup>50</sup> and listed as a VME by ICES <sup>51</sup> . Therefore, the pMPA provides protection of an OSPAR, Annex I and VME habitat.
Coral gardens	Provides current representation of a primary marine feature that would not otherwise	The feature is protected in two SACs in the deep sea marine reserve (Anton Dohrn Seamount	No information available.	Several sites have been identified off Scottish coasts. Little is known about their geographic	Coral gardens are Annex I habitat and OSPAR Threatened and/or Declining (T&D) species and habitats

<sup>44</sup> JNCC. 2019. Marine Protected Areas in the UK map. Available at: <http://jncc.defra.gov.uk/page-5201>. [Accessed on 05/02/2019]

<sup>45</sup> Huvenne, V.A.I., Bett, B.J., Massona, D.G., Le Bas, T.P., Wheeler, A.J., 2016. Effectiveness of a deep-sea cold-water coral Marine Protected Area, following eight years of fisheries closure. *Biological Conservation*. 200, pp: 60–69.

<sup>46</sup> Henry, L. A., Mayorga-Adame, C. G., Fox, A. D., Polton, J. A., Ferris, J. S., McLellan, F., McCabe, C., Kutti, T., Roberts, J. M. 2018. Ocean sprawl facilitates dispersal and connectivity of protected species. *Scientific reports*, 8(1), 11346. doi:10.1038/s41598-018-29575-4.

<sup>47</sup> Marine Scotland. 2018. Priority Marine Feature (PMF) - Fisheries management review – Cold-water Coral reefs. Available at: [https://consult.gov.scot/marine-scotland/priority-marine-features/supporting\\_documents/Review%20of%20PMFs%20outside%20the%20Scottish%20MPA%20network%20%20FINAL%20%20Coldwater%20coral%20reefs.pdf](https://consult.gov.scot/marine-scotland/priority-marine-features/supporting_documents/Review%20of%20PMFs%20outside%20the%20Scottish%20MPA%20network%20%20FINAL%20%20Coldwater%20coral%20reefs.pdf)

<sup>48</sup> Marine Scotland. 2018. Ibid.

<sup>49</sup> Huvenne *et al.* 2016. Ibid.

<sup>50</sup> Davies, J. S., Stewart, H. A., Narayanaswamy, B. E., Jacobs, C., Spicer, J., Golding, N., & Howell, K. L. 2015. Benthic Assemblages of the Anton Dohrn Seamount (NE Atlantic): Defining Deep-Sea Biotopes to Support Habitat Mapping and Management Efforts with a Focus on Vulnerable Marine Ecosystems. *PloS one*, 10(5), e0124815. doi:10.1371/journal.pone.0124815

<sup>51</sup> JNCC. 2018. Supplementary Advice on Conservation Objectives for Rosemary Bank Seamount Nature Conservation Marine Protected Area Available at: [http://jncc.defra.gov.uk/pdf/RBS\\_SACO\\_V1.0.pdf](http://jncc.defra.gov.uk/pdf/RBS_SACO_V1.0.pdf)

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience	
	be included within the network (as Hatton Bank cSAC is currently a candidate SAC). Provides representation of an OSPAR species in Region V <sup>52</sup> and for Annex I habitat. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	and East Rockall Bank) and in Hatton Bank cSAC outside the reserve <sup>53</sup> .		range and variation. There are both hard and soft bottom coral gardens found in these waters <sup>54</sup> .	and it is suspected that trawling and smothering have been a threat to their decline <sup>55</sup> . Therefore, the pMPA can provide protection for an OSPAR and Annex I species. Coral gardens are also designated as a VME.	
Leafscale gulper shark	Provides representation of this feature in OSPAR Region III and a highly-migratory feature <sup>56</sup> .	Leafscale gulper sharks are not protected at any other sites, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature). The deep sea marine reserve provides	There are likely to be important populations of the species that are resident throughout the deep sea reserve. The reserve is also central to the species' distribution. There are possible breeding sites within the deep sea marine reserve and the species is highly-migratory with extensive migrations	The deep sea marine reserve provides representation of leafscale gulper shark in OSPAR Region III. The Rockall Trough serves as classic deep sea habitat and rich feeding grounds for the species <sup>59</sup> .	The stock is depleted and classified as endangered. They are at-risk of being caught as bycatch in trawl fisheries (particularly for roughnose grenadier, black scabbardfish and blue ling) and occur in 15% of trawl hauls). Therefore, protection in this area could reduce their	

<sup>52</sup> Marine Scotland. 2018. Scottish MPA network - Parliamentary Report.

<sup>53</sup> MCCIP. 2018. Climate change and marine conservation: Supporting management in a changing environment: Coral gardens. Available at: [http://www.mccip.org.uk/media/1810/mccip-coral-gardens-report-card\\_second-run\\_v5.pdf](http://www.mccip.org.uk/media/1810/mccip-coral-gardens-report-card_second-run_v5.pdf)

<sup>54</sup> Marine Scotland. 2019. FeAST tool. Available at: <https://www.marine.scotland.gov.uk/feast/GlossaryFeatureView.aspx>. [Accessed on 05/02/2019]

<sup>55</sup> Tyler-Walters, H., James, B. (eds.), Wilding, C., Durkin, O., Lacey, C., Philpott, E., Adams, L., Chaniotis, P.D., Wilkes, P.T.V., Seeley, R., Neilly, M., Dargie, J. and Crawford-Avis, O.T. (2012). Descriptions of Marine Protected Area (MPA) search features. A report produced by MarLIN (Marine Life Information Network), SMRU Ltd., Scottish Natural Heritage and the Joint Nature Conservation Committee, for the Scottish Marine Protected Areas Project.

<sup>56</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough.

<sup>59</sup> Priede, I.G. 2018. Ibid.

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
		the only representation in OSPAR Region III <sup>57</sup> .	throughout the Northeast Atlantic <sup>58</sup> .		mortality through bycatch in commercial fisheries <sup>60</sup> .
Burrowed mud (including sea pens)	The pMPA provides the only representation of the feature within the deep sea marine reserve area. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	There are several sites within Scottish waters where burrowed muds are designated within MPAs <sup>61</sup> with one that is on the boundary with the West of Scotland pMPA (Geikie Slide and Hebridean Slope NCMPA). This site is not subject to management <sup>62</sup> and therefore, the feature is not protected in offshore sites.	The site has PMFs including sea pens and sea pen and burrowing megafauna communities (which are OSPAR species) and these provide functional links to other features within the deep sea marine reserve that are OSPAR species <sup>63</sup> .	Deep burrowed muds are almost exclusively found in from the northern North Sea and from sea lochs in western Scotland and the Hebrides <sup>64</sup> . The pMPA reflects areas essential for this species.	Burrowed mud can support communities and species such as Seapens and burrowing megafauna in circalittoral fine mud. Whilst additional representation may not be required, some of the supporting communities and species have low population levels for example, fireworks anemone are nationally scarce <sup>65</sup> . In addition, they support OSPAR species. Therefore, the site complements existing protection of dependent features, adding to resilience and provide protection to OSPAR species.
Deep sea sponge aggregations	The proposal provides an area with important concentrations and quantities of sponges <sup>66</sup> .	Several sites within or neighbouring the deep sea marine reserve currently include deep	No information available.	The proposed site provides a good quality example of the feature to add to the integrity of the	Deep sea sponge aggregations are considered to be Threatened and/or Declining across the North-

<sup>57</sup> Ibid.

<sup>58</sup> Priede, I.G. 2018. Ibid.

<sup>60</sup> Priede, I.G. 2018. Ibid.

<sup>61</sup> JNCC. 2019. Marine Protected Areas in the UK map. Available at: <http://jncc.defra.gov.uk/page-5201>. [Accessed on 05/02/2019]

<sup>62</sup> JNCC. 2018. Geikie Slide and Hebridean Slope MPA. Available at: <http://jncc.defra.gov.uk/page-6481>. [Accessed on 05/02/2019]

<sup>63</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>64</sup> Marine Scotland. 2018. Burrowed mud. Available at: <http://marine.gov.scot/information/burrowed-mud>. [Accessed on 05/02/2019]

<sup>65</sup> Marine Scotland. 2018. Ibid.

<sup>66</sup> JNCC. 2014. Faroe-Shetland sponge belt nature conservation MPA. Available at: [http://jncc.defra.gov.uk/pdf/Faroe-Shetland\\_Sponge\\_Belt\\_Application\\_of\\_the\\_MPA\\_Selection\\_Guidelines\\_v5\\_0.pdf](http://jncc.defra.gov.uk/pdf/Faroe-Shetland_Sponge_Belt_Application_of_the_MPA_Selection_Guidelines_v5_0.pdf). [Accessed on 05/02/2019]

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience	
	The site provides protection of OSPAR species <sup>67</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	sea sponge aggregations as a protected feature (Rosemary Bank Seamount; Faroe Shetland Sponge Belt) <sup>68</sup> .		proposals and complement the existing protection where the feature is considered to be threatened or declining in Regions III and V.	east Atlantic by the OSPAR Commission <sup>69</sup> . Though there are designated sites with the feature listed, there is currently a lack of management within these sites to protect the species. Deep sea sponge aggregations are also designated as a VME.	
Offshore deep sea muds	Representative of Scotland's continental slope habitat and deep sea floor <sup>70</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Several sites within or near the pMPA currently have offshore deep sea muds as a designated feature (Barra Fan and Hebrides Terrace Seamount; Geikie Slide and Hebridean Slope; North-east Faroe-Shetland Channel) <sup>71</sup> .	This habitat provides a variety of functional links with several features and add to the integrity of these proposals and complement the existing protection throughout the sites found in the deep sea marine reserve. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>72</sup> .	Deep sea muds are mainly present in the deeper sections of the Faroe-Shetland Channel and the Rockall Trough and along continental slope habitats. Deep sea muds vary throughout the reserve, dependent on the depth, substrate, topography / current regime and temperature; variations in mud coarseness support different communities <sup>73</sup> .	Additional representation not required to achieve resilience, however the site complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>74</sup> .	

<sup>67</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>68</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>69</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

<sup>70</sup> Doggett *et al.* 2018. Ibid.

<sup>71</sup> Doggett *et al.* 2018. Ibid.

<sup>72</sup> Doggett *et al.* 2018. Ibid.

<sup>73</sup> Doggett *et al.* 2018. Ibid.

<sup>74</sup> Doggett *et al.* 2018. Ibid.

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience	
Offshore subtidal sands and gravels	Representative of Scotland's continental slope habitat and deep sea floor <sup>75</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Several sites that have designated this feature within or near the pMPA: North-east Faroe-Shetland Channel, Faroe Shetland Sponge Belt and the Geikie Slide and Hebridean Slope <sup>76</sup> .	This habitat provides a variety of functional links with several features and add to the integrity of these proposals and complement the existing protection throughout the sites found in the deep sea marine reserve. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>77</sup> .	The pMPA provides a good quality example of the feature to add to the integrity of the proposals and complement the existing protection in several sites already designated in the deep sea reserve area. There are important variations in gravel coarseness throughout the reserve, dependent on the depth, substrate, topography / current regime and temperature; variations in coarseness support different communities <sup>78</sup> .	Additional representation not required to achieve resilience, however the site complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>79</sup> .	
Seamount communities	MPA proposal would ensure representation of seamounts in OSPAR Region I and V <sup>80</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected	The feature is currently designated in Rosemary Bank Seamount and Barra Fan and Hebrides Terrace Seamount <sup>81</sup> .	No information available.	Seamount communities are found across the Northeast Atlantic. Different types of seamount communities, and habitats that occur on them, are represented within the pMPA. These include various non-reef	Seamount communities are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR Commission <sup>83</sup> . Therefore, the proposed MPA provides additional protection for an OSPAR species, which	

<sup>75</sup> Doggett *et al.* 2018. Ibid.

<sup>76</sup> Doggett *et al.* 2018. Ibid.

<sup>77</sup> Doggett *et al.* 2018. Ibid.

<sup>78</sup> Doggett *et al.* 2018. Ibid.

<sup>79</sup> Doggett *et al.* 2018. Ibid.

<sup>80</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>81</sup> Doggett *et al.* 2018. Ibid.

<sup>83</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					WSR
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
	feature above 800m depth.			forming corals, individual sponges, bivalves or bryozoans <sup>82</sup> .	supports many other proposed features.
Seamounts	MPA proposal would ensure representation of seamounts in OSPAR Region and V <sup>84</sup> .	The feature is currently protected in two sites (Rosemary Bank Seamount and Barra Fan and Hebrides Terrace Seamount). The proposal would ensure replication of this feature in regions I and V.	Seamounts within the pMPA are recommended because they protect several OSPAR Region I and V features, which are protected in the deep sea marine reserve area, such as orange roughy <sup>85</sup> . They also harbour listed species e.g. <i>Lophelia pertusa</i> <sup>86</sup> .	The pMPA provides a good quality example of the feature to add to the integrity of the proposals and complement the existing protection in several sites already designated in Region I and V.	Seamounts are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR Commission <sup>87</sup> . Therefore, the proposed MPA provides additional protection for an OSPAR species, which supports many other proposed features.
Blue Ling ( <i>Molva dypterygia</i> )	Provides representation of a commercially important species, covering its key spawning grounds <sup>88</sup> .	This feature is protected in sites: Rosemary Bank and Blue Ling Management Area - West of Scotland (not an MPA) <sup>89</sup> .	Rockall Trough provides important areas for spawning blue ling, which may be a critical source of juveniles throughout the deep sea marine reserve and surrounding seas as studies have shown that larvae are	There is one stock of Blue ling in the area (the southern stock), which is found from Faroes to the west of Scotland. The proposed area contains important spawning ground for the species <sup>91</sup> .	The stock is not overfished <sup>92</sup> but is vulnerable to targeted fishing on spawning aggregations <sup>93</sup> . Existing protection of this feature will add to resilience of the species by protecting spawning habitat, which has

<sup>82</sup> JNCC. 2018. Supplementary Advice on Conservation Objectives for Rosemary Bank Seamount Nature Conservation Marine Protected Area Available at: [http://jncc.defra.gov.uk/pdf/RBS\\_SACO\\_V1.0.pdf](http://jncc.defra.gov.uk/pdf/RBS_SACO_V1.0.pdf)

<sup>84</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>85</sup> Doggett *et al.* 2018. Ibid.

<sup>86</sup> Davies, J. S., Stewart, H. A., Narayanaswamy, B. E., Jacobs, C., Spicer, J., Golding, N., & Howell, K. L. 2015. Benthic Assemblages of the Anton Dohrn Seamount (NE Atlantic): Defining Deep-Sea Biotopes to Support Habitat Mapping and Management Efforts with a Focus on Vulnerable Marine Ecosystems. PloS one, 10(5), e0124815. doi:10.1371/journal.pone.0124815

<sup>87</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>88</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough

<sup>89</sup> Marine Scotland. 2018. Scottish MPA network - Parliamentary Report.

<sup>91</sup> Priede, I.G. 2018. Ibid.

<sup>92</sup> ICES. 2018. Blue ling (*Molva dypterygia*) in subareas 6–7 and Division 5.b (Celtic Seas, English Channel, and Faroes grounds). Published 7 June 2018

<sup>93</sup> Priede, I.G. 2018. Ibid.



## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
			carried by the current to other areas within its range <sup>90</sup> .		been shown to supply surrounding areas <sup>94</sup> .
Orange roughy ( <i>Hoplostethus atlanticus</i> )	The proposal provides representation of an OSPAR List of threatened and/or declining species and habitats and represents a mobile feature, where the proposed area may afford protection for its functional habitats, such as coral <sup>95</sup> .	Only represented within one site (Barra Fan and Hebrides Terrace Seamount MPA) <sup>96</sup> . Therefore, the proposal would allow further replication for this species. Additionally, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature) and there is a zero TAC for the species across the Northeast Atlantic.	Rockall Trough provides important areas for spawning orange roughy and the site may be of critical importance as a source of juveniles for the deep sea marine reserve and surrounding seas <sup>97</sup> .	In the North Atlantic, the feature inhabits continental slopes in the Mid-Ocean Ridge and around offshore banks in its preferred depths. Different parts of the site support orange roughy at various life stages, for example, larger fish are generally found on hills, while juveniles are found over flatter grounds <sup>98</sup> .	This feature is considered to be threatened and/or declining by the OSPAR Commission <sup>99</sup> . The proposed site will likely afford greater protection to this recovering species, as it is considered as a critical source of juveniles for surrounding waters <sup>100</sup> .
Portuguese dogfish ( <i>Centroscymnus coelolepis</i> )	The pMPA ensures representation of the feature in OSPAR Region V <sup>101</sup> .	There are no other protected sites in the area for this feature, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the	It is unknown if the Portuguese dogfish stock in this area is genetically distinct but there is evidence to show that the feature use the Rockall Trough for all or parts of their lifecycle.	The feature is found globally, however, the feature is resident in the deep sea marine reserve and the area serves as a potential breeding ground	This feature is considered to be threatened and/or declining by the OSPAR Commission <sup>104</sup> and the feature likely use all or part of the site for its entire

<sup>90</sup> Priede, I.G. 2018. Ibid.

<sup>94</sup> Priede, I.G. 2018. Ibid.

<sup>95</sup> Priede, I.G. 2018. Ibid.

<sup>96</sup> JNCC. 2018. Barra Fan and Hebrides Terrace Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6489>. [Accessed on 05/02/2019]

<sup>97</sup> Priede, I.G. 2018. Ibid.

<sup>98</sup> Priede, I.G. 2018. Ibid.

<sup>99</sup> Priede, I.G. 2018. Ibid.

<sup>100</sup> Priede, I.G. 2018. Ibid.

<sup>101</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019].

<sup>104</sup> OSPAR. 2019. Ibid.

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience	
		known distribution of the proposed protected feature).	However, previous studies have suggested that the site is important for adult mating and subsequently pregnant females migrate to the pupping grounds in West Africa <sup>102</sup> . Therefore, there may be important linkages with other fisheries.	for the species and important adult mating area. The whole lifecycle may be conducted in single areas such as those found in the deep sea marine reserve <sup>103</sup> .	lifecycle <sup>105</sup> . Therefore, this site would provide important protection to the feature in Region V.	
Roundnose grenadier ( <i>Coryphaenoides rupestris</i> )	The proposal provides representation of important spawning grounds <sup>106</sup> for the feature that would not otherwise be included within the network.	There are no other protected sites in the area for this feature, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature).	There are separate populations North and South of the Wyville Thompson Ridge. It is unknown how genetically distinct the feature's populations are but the Rockall Trough provides important areas for spawning and may be of critical importance as a source of juveniles within the area and for surrounding seas. Roundnose grenadier have a pelagic reproductive strategy and therefore, there is potential for linkage with areas outside of the deep sea marine reserve <sup>107</sup> .	The feature is widespread in North Atlantic slopes, however, the provides "optimal habitat for feeding, growth and spawning" <sup>108</sup> . There are several populations found in the deep sea marine reserve. In the North of the Faroe-Shetland Channel, the species is replaced by the roughnose grenadier ( <i>Macrourus berglax</i> ) <sup>109</sup> .	The stock is not overfished (above $B_{MSYTrigger}$ but below $B_{MSY}^{110}$ ). The Rockall Trough is used for all or part of its life cycle and protects important spawning habitats for the species	

<sup>102</sup> Priede, I.G. 2018. Ibid.

<sup>103</sup> Priede, I.G. 2018. Ibid.

<sup>105</sup> Priede, I.G. 2018. Ibid.

<sup>106</sup> Priede, I.G. 2018. Ibid.

<sup>107</sup> Priede, I.G. 2018. Ibid.

<sup>108</sup> Priede, I.G. 2018. Ibid.

<sup>109</sup> Priede, I.G. 2018. Ibid.

<sup>110</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 6 and 7 and divisions 5.b and 12.b (Celtic Seas and the English Channel, Faroes grounds, and western Hatton Bank). Published 7 June 2018. Available at: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/rng.27.5b6712b.pdf>.



## Appendix C: Site Assessment Tables

### C.2.7 Anticipated Impacts on Ecosystem Services

Table 9a. Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									WSR
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Benefits	Confidence
				Lower	Intermediate	Upper			
Fish and shellfish for human consumption	Moderate, important spawning sites <sup>111</sup>	On-site and off-site	Many stocks' biomass are not at MSY	Nil	Deep sea species to benefit from protection	Moderate, spawning areas for commercial species such as anglerfish – specifically on continental slopes around Rockall and juveniles have been observed around the Rockall Bank area. Key habitats e.g. for elasmobranchs <sup>112</sup>	Low	Moderate	
Fish and shellfish for non-human consumption			Stocks reduced from potential maximum						
Climate regulation	Moderate–high, carbon storage in deep sea habitats	On-site	Uncertain but potentially important services	Minimal			Moderate	Minimal	Moderate
Waste breakdown/detoxification	Low	On-site	Low–moderate	Minimal			Low	Minimal	Low
Non-use value of natural environment	Moderate, deep sea features (e.g. sponges) and sites, have non-use value	On-site	Non-use value of the site may decline	Moderate, protection of features of site from potential future decline			Low–Moderate, protection of features is valued non-users	Moderate	Moderate, extent of features, and value to society all uncertain

<sup>111</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>112</sup> Priede, I.G. 2018. Ibid.

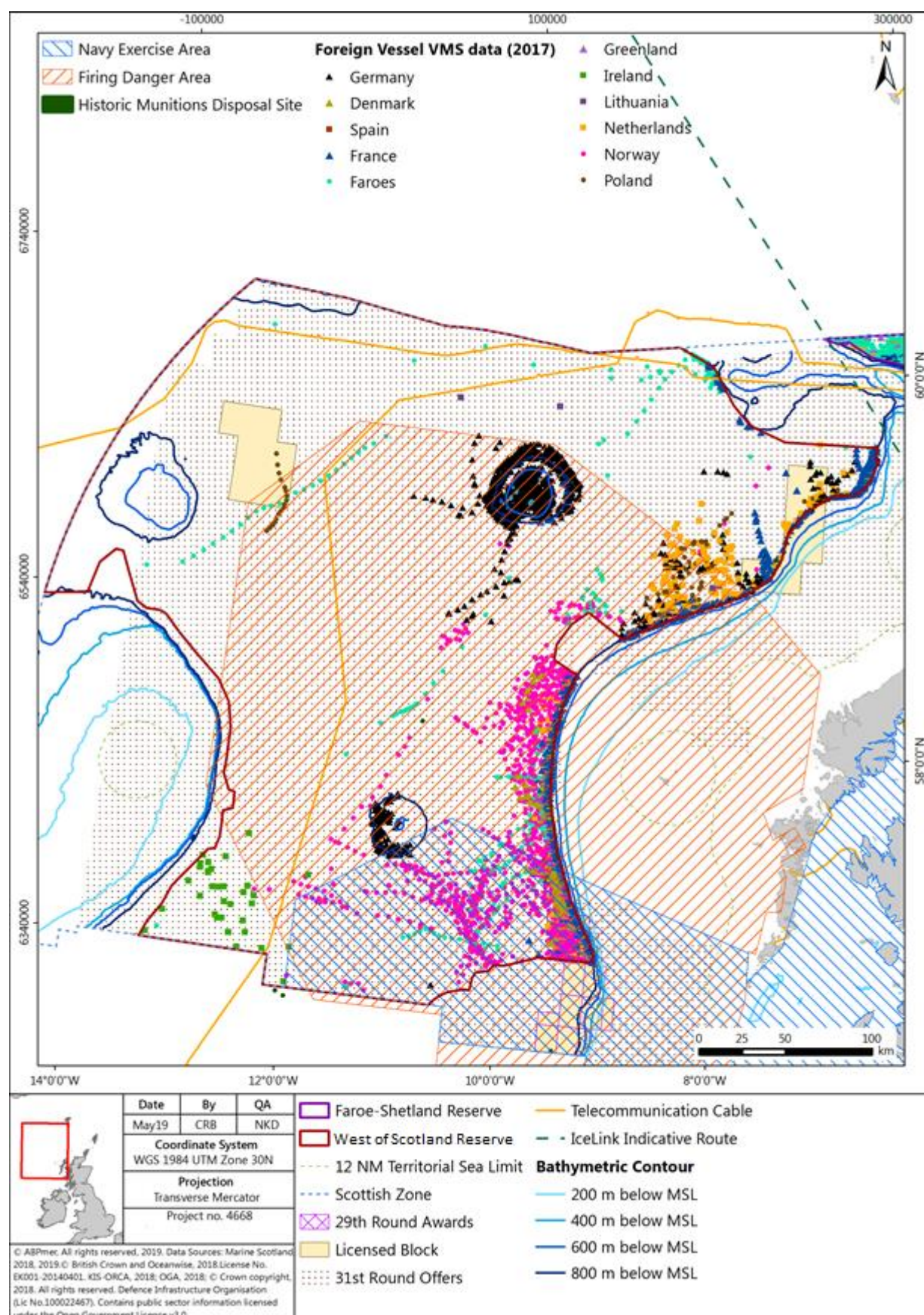
## Appendix C: Site Assessment Tables

Table 9a. Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									WSR
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Benefits	Confidence
				Lower	Intermediate	Upper			
Research and Education	Moderate, a number of biological features have research value, such as deep sea species <sup>113</sup>	On-site	Value of site may decline	Low, protection of key characteristics of site from decline, improving future research opportunities			Moderate	Low–Moderate	Low, extent to which research uses site in future uncertain.
Genetic Resources									
Supporting services	High	On-site and off-site	Moderate	Designation and management reduces risks of future decline			Moderate	Low	Moderate
Total value of changes in ecosystem services		On site & off-site	Moderate	Low–Moderate				Low–moderate	Low

Table 9b. Summary of Ecosystem Services Costs arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									WSR
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Costs	Confidence
				Lower	Intermediate	Upper			
No costs are expected to arise. The scale of fisheries impacts is considered to be too small for changes in fishing gear to occur, or for displacement of fishing effort, to have any noticeable impacts on ecosystem services outside the site.									

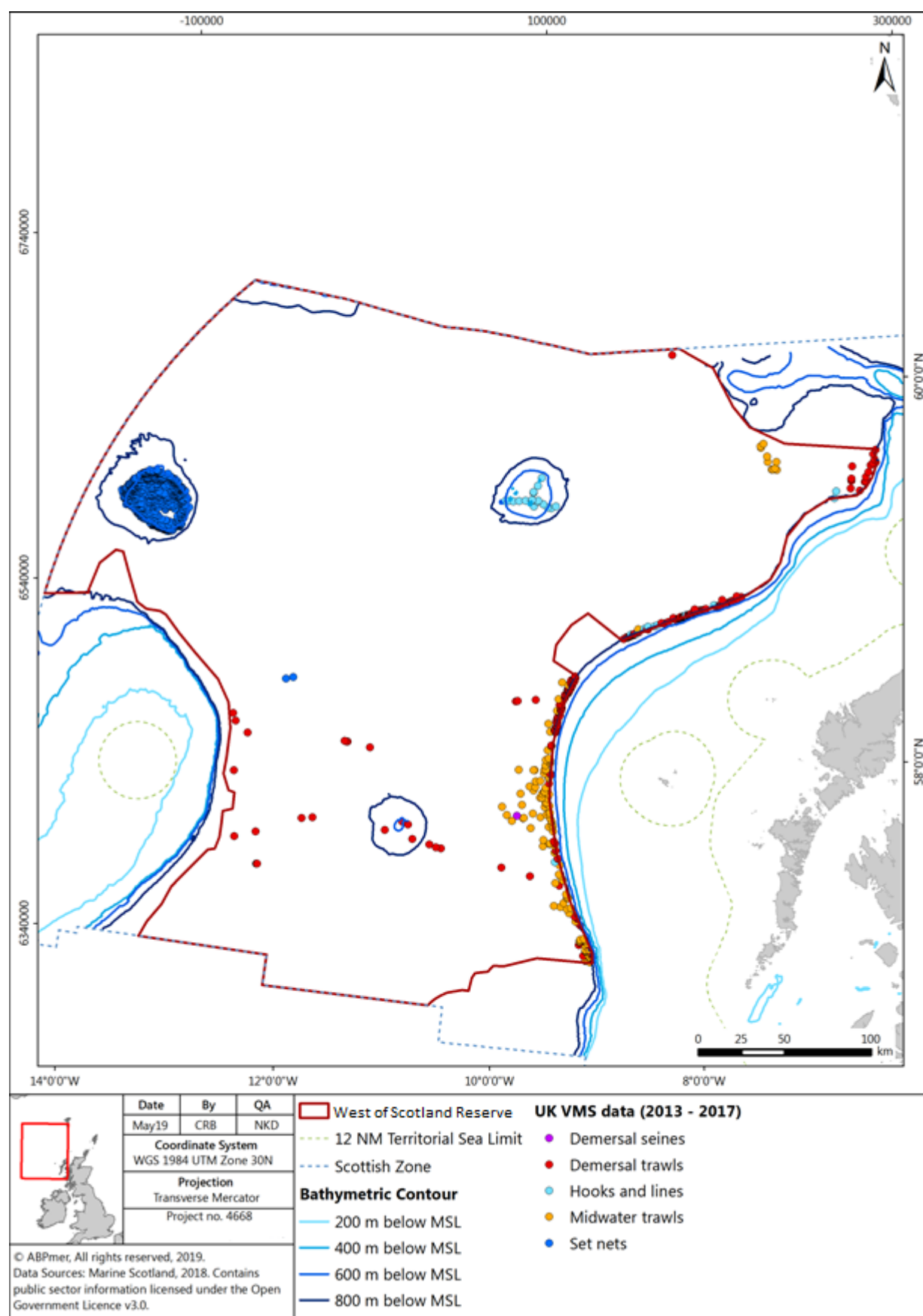
<sup>113</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. *JNCC Report No. 625*, JNCC, Peterborough, ISSN 0963-8091.

## Appendix C: Site Assessment Tables



**Figure C3 All sector activities in proposed West of Scotland reserve (excluding UK commercial fisheries)**

## Appendix C: Site Assessment Tables



**Figure C4 Commercial fisheries VMS data for proposed West of Scotland reserve (UK vessels)**



## C.3 Faroe-Shetland and West of Scotland Reserve (FWC)

### C.3.1 Site/Feature Summary

Site Extent (km<sup>2</sup>): 143,973

Table 1. Summary of Proposed Protected Features, Data Confidence and Conservation Objectives						FRC
Protected features						
<p>The combined Faroe-Shetland and West of Scotland areas encompasses many biodiversity features, which are listed below. Atlantic-influenced offshore deep sea muds and subtidal sands and gravels provide important functional links with Priority Marine Features, which are proposed to be designated in both sites, including cold-water coral reefs, coral gardens and deep sea sponge aggregations. These features are considered to be of functional significance, through e.g. biogeochemical cycling and supporting an assemblage of finer resolution habitats and species<sup>114</sup>. Both sites host important aggregations of various deep sea sponge species<sup>115</sup>. Burrowed muds provide important habitat, contributing to food web dynamics between burrowing species (such as squat lobsters) and benthic-feeding commercial fish species<sup>116</sup>. ICES has listed cold-water coral reefs as a VME and several of the features proposed in the both of the pMPAs are listed as declining or threatened by OSPAR in the region (such as deep sea sponge aggregations<sup>117</sup>, leafscale gulper shark, Portuguese dogfish and orange roughy<sup>118</sup>). In the West of Scotland, blue ling are a commercially-important species to the deep sea marine reserve and the pMPA acts as a significant proportion of the species range, including its spawning areas<sup>119</sup>. The West of Scotland pMPA forms an important area for orange roughy, which is listed as a threatened or declining species by OSPAR for the region. They concentrate on steep slopes, summits, rocky outcrops, canyons and carbonate mounds of the West of Scotland reserve and are particularly vulnerable to fishing in this site as they aggregate during spawning<sup>120</sup>. Roundnose grenadier are a commercially important species and the West of Scotland reserve provides important foraging areas for the species<sup>121</sup>.</p>						
Summary of confidence in presence, extent and condition of protected features and conservation objectives						
Protected Feature	Estimated Area of Feature (km <sup>2</sup> ) or Number of Individuals	Confidence in Feature Presence	Confidence in Feature Extent	Confidence in Feature Condition	Conservation Objective	
<b>Biodiversity Features</b>						
Burrowed mud (including Seapens)	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover	

<sup>114</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091

<sup>115</sup> Howell, K., Piechaud, N., Downie, A., Kenny, A., The distribution of deep-sea sponge aggregations in the North Atlantic and implications for their effective spatial management Deep-Sea Research Part I, 115, pp. 309-320.

<sup>116</sup> Doggett *et al.* 2018. Ibid.

<sup>117</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

<sup>118</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>119</sup> Priede, I.G. 2018. Ibid.

<sup>120</sup> Priede, I.G. 2018. Ibid.

<sup>121</sup> Priede, I.G. 2018. Ibid.

## Appendix C: Site Assessment Tables

Coral gardens	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Cold-water coral reefs (including <i>Lophelia pertusa</i> reefs)	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
Deep sea sponge aggregations	N/A <sup>a</sup>	Yes	Partial	Unfavourable (uncertain)	Recover
Offshore deep sea muds	N/A <sup>a</sup>	Yes	Partial (WSR), Yes (FSR)	Unfavourable (uncertain)	Recover
Offshore subtidal sands and gravels	N/A <sup>a</sup>	Yes	Partial (WSR), Yes (FSR)	Unfavourable (uncertain)	Recover
Seamount communities	N/A <sup>a</sup>	Yes	Yes	Unfavourable (uncertain)	Recover
Seamounts	N/A <sup>a</sup>	Yes	Yes	Favourable (uncertain)	Conserve
Blue Ling ( <i>Molva dypterygia</i> )	Biomass well above $B_{MSYTrigger}$ in subareas 6–7 and Division 5.b <sup>122</sup>	Yes	Yes	Favourable (uncertain)	Conserve
Leafscale gulper shark ( <i>Centrophorus squamosus</i> ) / Gulper shark ( <i>Centrophorus granulosus</i> )	Endangered. Unknown stock status but survey index shows recent increases in abundance <sup>123</sup> .	Yes	Partial	Uncertain	Conserve
Orange roughy ( <i>Hoplostethus atlanticus</i> )	Below possible reference points <sup>124</sup>	Yes	Partial	Uncertain	Conserve
Portuguese dogfish ( <i>Centroscymnus coelolepis</i> )	Endangered. Unknown stock status but survey index shows no abundance trend <sup>125</sup> .	Yes	Partial	Uncertain	Conserve

<sup>122</sup> ICES. 2019. Blue ling (*Molva dypterygia*) in subareas 6–7 and Division 5.b (Celtic Seas, English Channel, and Faroes grounds). Published 7 June 2018 Available at: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/bli-5b67.pdf>

<sup>123</sup> ICES. 2018. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–28 June 2018, Lisbon, Portugal. ICES CM 2018/ACOM:16. 1306 pp.

<sup>124</sup> ICES. 2016. Orange roughy (*Hoplostethus atlanticus*) in the Northeast Atlantic. Published 3 June 2016. Available at: <http://ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/ory-comb.pdf>

<sup>125</sup> ICES. 2018. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–28 June 2018, Lisbon, Portugal. ICES CM 2018/ACOM:16. 1306 pp.

## Appendix C: Site Assessment Tables

Round-nose grenadier ( <i>Coryphaenoides rupestris</i> )	Endangered. Population size is unknown <sup>126,127</sup>	Yes	Partial	Uncertain	Conserve
Key: <sup>a</sup> Biodiversity habitat feature data is from point sources therefore an estimate of the area of features is not available.					

<sup>126</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 1, 2, 4, 8, and 9, Division 14.a, and in subdivisions 14.b.2 and 5.a.2 (Northeast Atlantic and Arctic Ocean). Published 7 June 2017.

<sup>127</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 6 and 7 and divisions 5.b and 12.b (Celtic Seas and the English Channel, Faroes grounds, and western Hatton Bank). Published 7 June 2018.

## Appendix C: Site Assessment Tables

### C.3.2 Summary of Costs and Benefits

Table 2. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)				FWC
Human Activity	Cost Impact on Activity			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Economic Costs (Discounted)</b>				
Commercial Fisheries (GVA)	0	Cannot be disclosed	8,826	
Oil and Gas	63	0	0	
Power Interconnectors	5	5	5	
Seabed Mining	3	0	0	
Telecommunication Cables	25	25	25	
<b>Total Quantified Economic Costs</b>	<b>96</b>	<b>30</b>	<b>30</b>	
<b>Total Quantified Economic Costs (GVA)</b>	<b>0</b>	<b>Cannot be disclosed</b>	<b>8,826</b>	
<b>Non-Quantified Economic Costs</b>				
Commercial fisheries	None	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (63 vessels), Faroese (37 vessels), Irish (26 vessels), French (14 vessels), Dutch (7 vessels), German (6 vessels), Danish (5 vessels), Spanish (4 vessels), Greenland (3 vessels), Lithuanian (3 vessels), Polish (1 vessel), Swedish (1 vessel).</li> <li>If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>Gear conflict.</li> <li>Increased fishing pressure on species outside of the site.</li> <li>Changes to vessel costs/revenues</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Loss of value of landings from non-UK vessels: Norwegian (63 vessels), Faroese (37 vessels), Irish (26 vessels), French (14 vessels), Dutch (7 vessels), German (6 vessels), Danish (5 vessels), Spanish (4 vessels), Greenland (3 vessels), Lithuanian (3 vessels), Polish (1 vessel), Swedish (1 vessel).</li> <li>If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>Gear conflict.</li> <li>Increased fishing pressure on species outside of the site.</li> <li>Changes to vessel costs/revenues</li> </ul> </li> </ul>	
Oil and Gas	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone oil and gas extraction</li> <li>Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone oil and gas extraction</li> <li>Future oil and gas activity displaced to areas outside of the reserves</li> </ul>	
Interconnectors	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	
Seabed mining	<ul style="list-style-type: none"> <li>Cost of uncertainty and delays to licence applications</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone mineral extraction</li> <li>Future seabed mining activity displaced to areas outside of the reserves</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity costs of foregone mineral extraction</li> <li>Future seabed mining activity displaced to areas outside of the reserves</li> </ul>	



## Appendix C: Site Assessment Tables

Table 2. Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)				FWC
Human Activity	Cost Impact on Activity			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
Telecommunication cables	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	<ul style="list-style-type: none"> <li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li> </ul>	
<b>Note:</b> For detailed information on economic cost impacts on activities, see Table 3.				

## Appendix C: Site Assessment Tables

### C.3.3 Human Activity Summaries

#### Site-Specific Economic Costs on Human Activities arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 3a: Commercial fisheries				FWC
<p>The proposed Faroe-Shetland and West of Scotland reserve lies within ICES Division 2a, 4a, 5b, 6a and 6b. Approximately 67,000 tonnes of fish and shellfish were landed by UK vessels per year from the ICES rectangles that the area overlaps<sup>128</sup> (2013-2017). Over 85% were pelagic species.</p> <p>Figure C6 shows the VMS pings from UK over-12m vessels between 2013 and 2017 and indicates that the main gear types that operate within the proposed Faroe-Shetland and West of Scotland reserve combined include midwater trawls (84%) and surrounding nets (15%). Midwater trawls operate along the shelf edges of both the reserves; set nets operate on George Bligh Bank in waters less than 600m depth and there are occasional scattered pings from demersal trawls, surrounding nets and midwater trawls within the middle of the reserves (Figure C6). The value of landings from the pMPA was £1.1 million (over-12m vessels, from VMS data) (annual average for 2013–2017, 2019 prices). Some of these landings have already been excluded or will be excluded by proposed management measures (e.g. CFP prohibition on trawling below 800m, management measures in Rosemary Bank Seamount NCMMPA).</p> <p>Scotmap data indicate that under-15m vessels do not fish in the proposed reserve but Marine Scotland ICES rectangle landings data show that there have been a small amount of landings caught from an ICES rectangle that overlaps the proposed reserve, by under-12m vessels. It is unlikely that these landings were caught inside the reserve due to the depth of water inside the proposed reserve and its remoteness from land.</p> <p>VMS ping data indicate that the main non-UK vessels fishing in the proposed Faroe-Shetland and West of Scotland reserve include vessels from Norway, Faroe Islands, Ireland and French (Figure C5). It is not clear which gear types were used by these vessels and there is no information on landings, therefore it is not possible to estimate costs for the intermediate or upper estimates. Overall the Norwegian fleets focused their effort along the slopes of both reserves (northern slopes in the Faroe-Shetland and south-eastern slopes in the West of Scotland reserve). Faroese fleets largely fished on the slopes or near the Wyville Thomson Ridge area in the area of the proposed Faroe-Shetland proposed reserve. German fleets either concentrated their effort on the Rosemary Bank, Anton Dohrn seamount or in the north-eastern areas of the assessed Faroe-Shetland reserve.</p> <p>Vessels fishing in the proposed Faroe-Shetland and West of Scotland reserve combined predominantly operate from Peterhead (61%), Lerwick (26%) and Fraserburgh (13%). Landings were made predominantly into Peterhead (58%), Skaagen (Denmark) (25%) and Hantsholm (Denmark) (9%).</p> <p>Although the values for individual gear types cannot be disclosed, the impact under the intermediate scenario predominantly falls on set nets, and under the upper scenario predominantly falls on midwater trawls and surrounding nets.</p>				
Economic Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive)				
	Lower Estimate	Intermediate Estimate	Upper Estimate	

<sup>128</sup> Note that these figures include areas within the ICES rectangles that lie outside of the proposed reserve boundaries.

## Appendix C: Site Assessment Tables

Assumptions for impacts		<ul style="list-style-type: none"> <li>• Designation as an MPA with existing management</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusion of all demersal mobile and static gears</li> <li>• It is assumed that hook and line gears on Rosemary Bank Seamount are managed through the measures for that MPA</li> <li>• It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusion of all demersal and pelagic static and mobile gears</li> <li>• It is assumed that hook and line gears on Rosemary Bank Seamount are managed through the measures for that MPA</li> <li>• It is assumed there is no cost to demersal trawlers operating below 800m, as this activity is already prohibited through Council Regulation (EC) 2016/2336</li> </ul>
Description of quantified impacts – cost impacts per fleet segment (annual values, £000s, 2019 prices) (on-site)*	<b>Over-12m vessels</b> Subtotal for all gears combined	<ul style="list-style-type: none"> <li>• Loss of &gt;12m fishing income: 0</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of &gt;12m fishing income: Cannot be disclosed</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of &gt;12m fishing income: 1,000</li> </ul>
	<b>Total all vessels</b>	0	<b>Cannot be disclosed</b>	<b>1,000</b>
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of value of landings from non-UK vessels: Norwegian (63 vessels), Faroese (37 vessels), Irish (26 vessels), French (14 vessels), Dutch (7 vessels), German (6 vessels), Danish (5 vessels), Spanish (4 vessels), Greenland (3 vessels), Lithuanian (3 vessels), Polish (1 vessel), Swedish (1 vessel).</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of value of landings from non-UK vessels: Norwegian (63 vessels), Faroese (37 vessels), Irish (26 vessels), French (14 vessels), Dutch (7 vessels), German (6 vessels), Danish (5 vessels), Spanish (4 vessels), Greenland (3 vessels), Lithuanian (3 vessels), Polish (1 vessel), Swedish (1 vessel).</li> </ul>
	Off-site	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> <li>○ Changes to vessel costs/revenues</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• If activity is displaced rather than lost, there is potential for: <ul style="list-style-type: none"> <li>○ Gear conflict.</li> <li>○ Increased fishing pressure on species outside of the site.</li> <li>○ Changes to vessel costs/revenues</li> </ul> </li> </ul>
<b>Quantified Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive) (deriving from on-site impacts)</b>				
<b>Cost Impacts (£000s)</b>				
Total costs (2019–2038)		0	Cannot be disclosed	20,010
Average annual costs		0	Cannot be disclosed	1,000

## Appendix C: Site Assessment Tables

Present value of total costs (2019–2038)	0	Cannot be disclosed	14,717
<b>Economic Impacts</b>			
<b>Direct GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	12,000
Average annual change in GVA	0	Cannot be disclosed	600
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	8,826
<b>Direct + Indirect GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	17,374
Average annual change in GVA	0	Cannot be disclosed	869
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	12,779
<b>Direct, Indirect + Induced GVA (£000s)</b>			
Total change in GVA (2019–2038)	0	Cannot be disclosed	19,524
Average annual change in GVA	0	Cannot be disclosed	976
Present value of total change in GVA (2019–2038)	0	Cannot be disclosed	14,360
<b>Employment (FTEs)</b>			
Direct and indirect reduction in employment	0.0	Cannot be disclosed	15.2
Direct, indirect and induced reduction in employment	0.0	Cannot be disclosed	16.4
<p>* On-site cost impacts may be offset by catches from effort displaced off-site, detailed in the assumptions.</p> <p>** Where the value of landings affected is less than 10% of the value from the site, less than 10% of the value from each ICES rectangle, or less than 1% of the value from the region, it is likely that this activity can be absorbed by other grounds in the pMPA, ICES rectangles or region as appropriate, and therefore no cost impact is anticipated.</p> <p>Definitions of cost and economic impacts:</p> <p>Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period.</p> <p>Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20).</p> <p>Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.</p> <p>Total change in GVA (2019–2038) = The change in GVA (direct/indirect/induced as appropriate) for commercial fisheries summed over the 20 year period.</p> <p>Average annual change to GVA = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries divided by the total number of years under analysis (i.e. 20).</p> <p>Present value of total change in GVA (2019–2038) = Total change in GVA (direct/indirect/induced as appropriate) for commercial fisheries discounted to current value, using a discount rate of 3.5%.</p> <p>Direct, indirect reduction in Employment = The average (mean) reduction in direct employment in the sector in full-time equivalents (FTEs), and indirect reduction in employment on the sector's suppliers.</p> <p>Direct, indirect and induced reduction in employment = The average (mean) reduction in employment in the sector, the sector's suppliers and across the economy as a whole as a result of reduced expenditure by employees and suppliers.</p> <p>The values for the intermediate scenario cannot be disclosed as they would allow the values for the Faroe-Shetland reserve (which cannot be disclosed) to be calculated.</p>			

## Appendix C: Site Assessment Tables

Table 3b: Oil and Gas		FWC	
There is some overlap between the proposed Faroe-Shetland and West of Scotland reserve and oil and gas exploration. This includes 19 licensed blocks, 10 blocks from the 29 <sup>th</sup> licensing round, 5 blocks from the 29 <sup>th</sup> licensing round, 28 blocks from the 30 <sup>th</sup> licensing round and 621 blocks from the 31 <sup>st</sup> licensing round. These are shown in Figure C5. Since oil and gas activity could be conducted under the lower management scenario, the costs for the blocks that have the potential for oil and gas extraction have been estimated. In the assessed Faroe-Shetland reserve area, there is one licensed block that has an undeveloped discovery located inside the block and two licensing round blocks that overlap with an undeveloped discovery and therefore have potential for oil and gas extraction. In the West of Scotland reserve area, there is one licensed block that has an undeveloped discovery located inside the block (licence number 2138 with undeveloped discovery number 154/01- 1). The costs of the additional assessments required for these blocks have been calculated in for the lower management scenario. Under the intermediate and upper management scenarios, no extraction can occur from the seabed and therefore, this represents an opportunity cost for the oil and gas sector that cannot be quantified.			
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)			
	Lower Estimate	Intermediate Estimate	Upper Estimate
Assumptions for impacts	<ul style="list-style-type: none"><li>• New development proposals affecting MPAs will require additional assessment of impacts to protected features;</li><li>• Additional assessment costs per licence application are estimated to be £5.6k (at 2019 prices);</li><li>• In the Faroe-Shetland reserve, costs are incurred for one licensed block and two licensing blocks that overlap with an undeveloped discovery. It is assumed that the licensed block and one of the two licensing blocks will progress to the Third term. The other licensing block will only proceed to the Second term.</li><li>• In the West of Scotland reserve, costs are incurred for one licensed block that overlap with an undeveloped discovery. It is assumed that the licensed block in the West of Scotland reserve will not proceed to the Third term given how remote the site is from current oil and gas infrastructure.</li><li>• Assessments are assumed to be required for geotechnical surveys, seismic surveys, exploration drilling and extraction activities.</li></ul>	<ul style="list-style-type: none"><li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	<ul style="list-style-type: none"><li>• Oil and gas extraction is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>

## Appendix C: Site Assessment Tables

Description of quantified impacts - (on-site)		Additional assessment costs for licence applications: <ul style="list-style-type: none"> <li>• Geotechnical surveys (2021 during the Initial Term) (£22.4k).</li> <li>• Seismic surveys (2024, mid-way through the Initial Term) (£22.4k)</li> <li>• Exploration drilling (2027, end of the Initial Term) (£22.4k)</li> <li>• Extraction activities inc. pipeline development (2038, middle of the Third Term) (£11.2k).</li> </ul>	• N/A	• N/A
Description of non-quantified impacts	On-site	• Cost of uncertainty and delays to licence applications	• Opportunity costs of foregone oil and gas extraction	• Opportunity costs of foregone oil and gas extraction
	Off-site	• N/A	• Future oil and gas activity displaced to areas outside of the reserves	• Future oil and gas activity displaced to areas outside of the reserves
<b>Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)</b>				
<b>Cost Impacts (£000s)</b>				
Total costs (2019–2038)		78	0	0
Average annual costs		4	0	0
Present value of total costs (2019–2038)		63	0	0
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.				

## Appendix C: Site Assessment Tables

Table 3c: Power Interconnectors					FWC
There are no power interconnectors currently located within the proposed Faroe-Shetland and West of Scotland reserve. There is one project identified for potential development over the assessment period (IceLink), which is currently in the feasibility stage of the project, and is expected to be in operation in 2025. This transects the assessed Faroe-Shetland reserve area. This project will require additional assessments to support planning applications (including marine licence) and regular survey to support operation and maintenance following construction. The proposed interconnector route is shown in Figure C5.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		It has been assumed that: <ul style="list-style-type: none"><li>• IceLink is the only proposed interconnector in the deep sea marine reserve during the assessment period.</li><li>• the additional assessment required to include MPA features is £5.6k for each application.</li><li>• additional assessment costs will be incurred in 2022.</li></ul>	It has been assumed that: <ul style="list-style-type: none"><li>• IceLink is the only proposed interconnector in the deep sea marine reserve during the assessment period.</li><li>• the additional assessment required to include MPA features is £5.6k for each application.</li><li>• additional assessment costs will be incurred in 2022.</li></ul>	It has been assumed that: <ul style="list-style-type: none"><li>• IceLink is the only proposed interconnector in the deep sea marine reserve during the assessment period.</li><li>• the additional assessment required to include MPA features is £5.6k for each application.</li><li>• additional assessment costs will be incurred in 2022.</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>• Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k.</li></ul>	<ul style="list-style-type: none"><li>• Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k.</li></ul>	<ul style="list-style-type: none"><li>• Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5.6k.</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>• Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>• Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>• Cost of uncertainty and delays to licence applications</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>	<ul style="list-style-type: none"><li>• N/A</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019–2038)		6	6	6	
Average annual costs		<1	<1	<1	
Present value of total costs (2019–2038)		5	5	5	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					

## Appendix C: Site Assessment Tables

Table 3d: Seabed Mining					FWC
There is no seabed mining occurring within the proposed Faroe-Shetland and West of Scotland reserve. The UK's domestic EEZ is not expected to be able to support significant commercial interest as it is currently unknown if the UK harbours sufficient commercial-scale mineral deposits. However, heavy minerals have been identified in Scottish waters, close to the assessed Faroe-Shetland reserve and there may be potential for future exploitation. It is assumed that one application will be submitted towards the end of the assessment period in the assessed Faroe-Shetland reserve area but no applications will be submitted in the West of Scotland reserve area within the assessment period. However, under the intermediate and upper management scenarios, no seabed mining can occur. This represents an opportunity cost that cannot be quantified.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>It is assumed that some application for seabed mining may occur in the Faroe-Shetland part of the marine reserve, towards the end of the assessment period</li><li>New development proposals affecting MPAs will require additional assessment of impacts to protected features</li><li>Additional assessment costs per licence application are estimated to be £5.6k (at 2019 prices)</li></ul>	<ul style="list-style-type: none"><li>Seabed mining activity is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	<ul style="list-style-type: none"><li>Seabed mining activity is not permitted, this represents an opportunity cost that cannot be quantified</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>Cost of additional assessment for seabed mining projects transecting the site in 2038. Total cost = £5.6k</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>Cost of uncertainty and delays to licence applications</li></ul>	<ul style="list-style-type: none"><li>Opportunity costs of foregone mineral extraction</li></ul>	<ul style="list-style-type: none"><li>Opportunity costs of foregone mineral extraction</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>Future seabed mining activity displaced to areas outside of the reserves</li></ul>	<ul style="list-style-type: none"><li>Future seabed mining activity displaced to areas outside of the reserves</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019–2038)		6	0	0	
Average annual costs		<1	0	0	
Present value of total costs (2019–2038)		3	0	0	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					



## Appendix C: Site Assessment Tables

Table 3e: Telecommunication Cables					FWC
There are six telecommunication cables which transit the deep sea marine reserve, total approximately 1,462 km of length within the proposed Faroe-Shetland and West of Scotland reserve. Telecom cables are shown in Figure C5. It is assumed existing telecom cables are designed with a lifespan of 25 years and the lifespan will be reached for all of these cables during the assessment period.					
Economic Impacts Arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive)					
		Lower Estimate	Intermediate Estimate	Upper Estimate	
Assumptions for impacts		<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li><li>When a cable intersects both parts of the reserve, it is assumed that only one additional assessment is required when it is being replaced.</li></ul>	<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li><li>When a cable intersects both parts of the reserve, it is assumed that only one additional assessment is required when it is being replaced.</li></ul>	<ul style="list-style-type: none"><li>It has been assumed that the cost associated with additional assessment to support planning applications is £5.6k at the time of the cable replacement (after 25 years). The cables need replacing as shown in Table 10 in Appendix A.</li><li>When a cable intersects both parts of the reserve, it is assumed that only one additional assessment is required when it is being replaced.</li></ul>	
Description of quantified impacts - (on-site)		<ul style="list-style-type: none"><li>Cost of additional assessment (£33.6k)</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment (£33.6k)</li></ul>	<ul style="list-style-type: none"><li>Cost of additional assessment (£33.6k)</li></ul>	
Description of non-quantified impacts	On-site	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	<ul style="list-style-type: none"><li>Delays and potential re-routing of cables where features have been identified and are required to be avoided</li></ul>	
	Off-site	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>	
Quantified Impacts arising from the Designation and Management of the Site (Over 2019 to 2038 Inclusive) (Deriving from on-Site Impacts)					
Cost Impacts (£000s)					
Total costs (2019–2038)		34	34	34	
Average annual costs		2	2	2	
Present value of total costs (2019–2038)		25	25	25	
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.					

## Appendix C: Site Assessment Tables

### Human activities that would benefit from designation and management of the site as an MPA

Table 4. Human Activities that would Benefit from Designation and Management of the Site as an MPA				FWC
Activity	Description	Lower Estimate	Intermediate Estimate	Upper Estimate
Deep sea medicinal research	Protection of deep sea environments and species provides potential for scientific research to investigate benefits of deep sea organisms	Low		

### Human activities that would be unaffected by designation and management of the site as an MPA

Table 5. Human Activities that would be Unaffected by Designation and Management of the Site as an MPA				FWC
Activity	Description			
Aquaculture Finfish	There is no finfish aquaculture near to the sites.			
Aquaculture Shellfish	There is no shellfish aquaculture near to the sites.			
Aviation	There is no interaction between aviation and the deep sea marine reserve			
Carbon Capture and Storage (CCS)	No CCS sites or potential pipelines near the site.			
Coast Protection and Flood Defence	There are no coastal and flood defences near to the site.			
Energy Generation	There are no current proposals for energy generation which would be affected by the deep sea marine reserve, and the uncertainty regarding future development is too high to conclude any impact within the study period.			
Marine Aggregates	There is currently no existing or planned marine aggregate extraction in Scottish waters			
Ports and Harbours	There are no ports and harbours situated near to the site.			
Recreational Boating	The potential management scenarios would have no impact on recreational boating in the region of the deep sea marine reserve.			
Shipping	The potential management scenarios would have no impact on commercial shipping in the region of the deep sea marine reserve.			
Tourism	The proposed sites are situated too far away from potential tourism sites.			
Water Sports	The potential management scenarios would have no impact on watersports in the region of the deep sea marine reserve.			

## Appendix C: Site Assessment Tables

### C.3.4 Social and Distributional Analysis of Impacts Arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Social and Distributional Analysis of Impacts arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 inclusive)

Table 6a. Social Impacts Associated with Quantified and Non-Quantified Economic Impacts				FWC
Potential Economic Impacts	Area of Social Impact Affected	Mitigation	Significance of Social Impact	
x - xx	Employment in commercial fisheries (upper scenario)	None	x (upper scenario: xx)	
Impacts: xxx – significant negative effect; xx – possible negative effects; x – minimal negative effect, if any; 0 – no noticeable effect expected.				

Table 6b. Distribution of Social Impacts (Location, Age and Gender)								FWC
Sector/Impact	Scale of Impact by location			Age			Gender	
	Region	Ports*	Rural, Urban, Mainland or Island	Children	Working age	Pensionable Age	Male	Female
Unemployment	North East, North-east England, (upper also: Orkney)  For landings: North West (upper also: North East)	Home: North Shields – 77% (12%) Fraserburgh – 22% (21%) Lerwick – <1% (19%) Peterhead – 0% (49%) (also <1% at Ayr, Lochinver, Mallaig)	Rural	x	x	0	x	0
Lower Income		Landing: Abroad – 44% (25%) Ullapool – 27% (4%) Kinlochbervie – 21% (3%) Londonderry – 7% (1%) Scrabster – 1% (<1%) Fraserburgh – <1% (11%) Lerwick – 0% (3%) Peterhead – 0% (52%) Scalloway and Isles – <1% (<1%)	Rural	x	x	0	x	X
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected. * The value of landings affected by home or landing port, as a percentage of all the landings affected, under intermediate estimate (upper estimate in brackets)								

## Appendix C: Site Assessment Tables

Table 6c. Distribution of Social Impacts (Fishing Groups, Income Groups and Social Groups)								FWC
Sector/Impact	Fishing Groups		Income Groups			Vulnerable Social Groups		
	Vessel Category <12 m >12 m	Gear Types/Sector	10% most deprived	Middle 80%	10% most affluent	Crofters	Ethnic minorities	With disability or long-term sick
Unemployment	>12 m	Set nets, demersal trawls (upper also midwater trawls and surrounding nets)	x	x	x*	0	0	0
Lower Income			x	x	x*	0	0	0
Impacts: xxx/+++ – significant negative/positive effect; xx/++ – possible negative/positive effects; x/+ – minimal negative/positive effect, if any; 0 – no noticeable effect expected.								
* Possible negative impact on upper income group under the upper scenario, but data on wages in the pelagic sector are not available to confirm this								

## Appendix C: Site Assessment Tables

### C.3.5 Public Sector Costs

Table 7. Site/Feature-Specific Public Sector Costs arising from the Designation and Management of the Site as an MPA (over 2019 to 2038 Inclusive)				FWC
Description	Public Sector Costs (Present value discounted over assessment period)			
	Lower Estimate (£k)	Intermediate Estimate (£k)	Upper Estimate (£k)	
<b>Quantified Public Sector Costs (Present value, discounted over assessment period)</b>				
Preparation of Statutory Instruments	0.0	4.2	4.2	
De-designation of existing sites	8.4	8.4	8.4	
Site monitoring	3,220.9	3,220.9	3,220.9	
Compliance and enforcement	0	0	0	
Promotion of public understanding	0	0	0	
Regulatory and advisory costs associated with licensing decisions	9.6	3.1	3.1	
<b>Total Quantified Public Sector Costs</b>	<b>4,320.7</b>	<b>4,316.5</b>	<b>4,316.5</b>	
<b>Average annual costs</b>	<b>161.9</b>	<b>161.8</b>	<b>161.8</b>	
<b>Present value of total costs (2019–2038)</b>	<b>3,238.9</b>	<b>3,236.6</b>	<b>3,236.6</b>	

## C.3.6 Potential Contribution of the Site to an Ecologically-coherent Network

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
Cold-water coral reefs (including <i>Lophelia pertusa</i> reefs)	Provides representation of OSPAR listed feature. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Cold-water coral reefs are protected in both Anton Dohrn Seamount and East Rockall Bank SACs <sup>129</sup> . <i>Lophelia pertusa</i> has been protected in Darwin Mounds <sup>130</sup> .	<i>Lophelia pertusa</i> are shown to seed a metapopulation in larger areas around Scottish waters <sup>131</sup> and there is potential for long distance dispersal <sup>132</sup> .	Cold-water corals are found throughout the world's oceans, with a range from 55°S to 70°N in water temperatures between 4–8°C. The majority of cold-water corals are found beyond the shelf break around the Northeast Atlantic and off the UK, mainly on the continental slopes of west Scotland and Ireland <sup>133</sup> .	<i>Lophelia pertusa</i> are considered to have a 'very low resilience' <sup>134</sup> , are listed by OSPAR as a threatened or declining species and biogenic reefs under the EU Habitats Directive. Cold water coral reefs are defined as Annex I listed 'reef' habitat under the Habitat Directive <sup>135</sup> and listed as a VME by ICES <sup>136</sup> . Therefore, the pMPA provides protection of an OSPAR, Annex I and VME habitat.
Coral gardens	Provides representation of a primary marine feature that would not otherwise be included	The feature is protected in two SACs in the deep sea marine reserve (Anton Dohrn Seamount	No information available.	Several sites have been identified off Scottish coasts. Little is known about their geographic	Coral gardens are Annex I habitat and OSPAR Threatened and/or Declining (T&D) species and habitats

<sup>129</sup> JNCC. 2019. Marine Protected Areas in the UK map. Available at: <http://jncc.defra.gov.uk/page-5201>. [Accessed on 05/02/2019]

<sup>130</sup> Huvenne, V.A.I., Bett, B.J., Massona, D.G., Le Bas, T.P., Wheeler, A.J., 2016. Effectiveness of a deep-sea cold-water coral Marine Protected Area, following eight years of fisheries closure. *Biological Conservation*. 200, pp: 60–69.

<sup>131</sup> Henry, L. A., Mayorga-Adame, C. G., Fox, A. D., Polton, J. A., Ferris, J. S., McLellan, F., McCabe, C., Kutti, T., Roberts, J. M. 2018. Ocean sprawl facilitates dispersal and connectivity of protected species. *Scientific reports*, 8(1), 11346. doi:10.1038/s41598-018-29575-4.

<sup>132</sup> Marine Scotland. 2018. Priority Marine Feature (PMF) - Fisheries management review – Cold-water Coral reefs. Available at: [https://consult.gov.scot/marine-scotland/priority-marine-features/supporting\\_documents/Review%20of%20PMFs%20outside%20the%20Scottish%20MPA%20network%20%20FINAL%20%20Coldwater%20coral%20reefs.pdf](https://consult.gov.scot/marine-scotland/priority-marine-features/supporting_documents/Review%20of%20PMFs%20outside%20the%20Scottish%20MPA%20network%20%20FINAL%20%20Coldwater%20coral%20reefs.pdf)

<sup>133</sup> Marine Scotland. 2018. Ibid.

<sup>134</sup> Huvenne *et al.* 2016. Ibid.

<sup>135</sup> Davies, J. S., Stewart, H. A., Narayanaswamy, B. E., Jacobs, C., Spicer, J., Golding, N., & Howell, K. L. 2015. Benthic Assemblages of the Anton Dohrn Seamount (NE Atlantic): Defining Deep-Sea Biotopes to Support Habitat Mapping and Management Efforts with a Focus on Vulnerable Marine Ecosystems. *PloS one*, 10(5), e0124815. doi:10.1371/journal.pone.0124815

<sup>136</sup> JNCC. 2018. Supplementary Advice on Conservation Objectives for Rosemary Bank Seamount Nature Conservation Marine Protected Area Available at: [http://jncc.defra.gov.uk/pdf/RBS\\_SACO\\_V1.0.pdf](http://jncc.defra.gov.uk/pdf/RBS_SACO_V1.0.pdf)

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
	within the network. Provides representation of an OSPAR species in Region V <sup>137</sup> and for Annex I habitat. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	and East Rockall Bank) and in Hatton Bank cSAC outside the reserve <sup>138</sup> .		range and variation. There are both hard and soft bottom coral gardens found in these waters <sup>139</sup> .	and it is suspected that trawling and smothering have been a threat to their decline <sup>140</sup> . Therefore, the pMPA can provide protection for an OSPAR and Annex I habitat. Coral gardens are also designated as a Vulnerable Marine Ecosystem
Leafscale gulper shark	Provides representation of this feature in OSPAR Region III and a highly-migratory feature <sup>141</sup> .	Leafscale gulper sharks are not protected at any other sites, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature). The deep sea marine reserve provides the only representation in OSPAR Region III <sup>142</sup> .	There are likely to be important populations of the species that are resident throughout the deep sea reserve. The reserve is also central to the species' distribution. There are possible breeding sites within the deep sea marine reserve and the species is highly-migratory with extensive migrations	The deep sea marine reserve provides representation of leafscale gulper shark in OSPAR Region III. The Rockall Trough serves as classic deep sea habitat and rich feeding grounds for the species <sup>144</sup> .	The stock is depleted and classified as endangered. They are at-risk of being caught as bycatch in trawl fisheries (particularly for roughnose grenadier, black scabbardfish and blue ling) and occur in 15% of trawl hauls). Therefore, protection in this area could reduce their mortality through bycatch in commercial fisheries <sup>145</sup> .

<sup>137</sup> Marine Scotland. 2018. Scottish MPA network - Parliamentary Report.

<sup>138</sup> MCCIP. 2018. Climate change and marine conservation: Supporting management in a changing environment: Coral gardens. Available at: [http://www.mccip.org.uk/media/1810/mccip-coral-gardens-report-card\\_second-run\\_v5.pdf](http://www.mccip.org.uk/media/1810/mccip-coral-gardens-report-card_second-run_v5.pdf)

<sup>139</sup> Marine Scotland. 2019. FeAST tool. Available at: <https://www.marine.scotland.gov.uk/feast/GlossaryFeatureView.aspx>. [Accessed on 05/02/2019]

<sup>140</sup> Tyler-Walters, H., James, B. (eds.), Wilding, C., Durkin, O., Lacey, C., Philpott, E., Adams, L., Chaniotis, P.D., Wilkes, P.T.V., Seeley, R., Neilly, M., Dargie, J. and Crawford-Avis, O.T. 2012. Descriptions of Marine Protected Area (MPA) search features. A report produced by MarLIN (Marine Life Information Network), SMRU Ltd., Scottish Natural Heritage and the Joint Nature Conservation Committee, for the Scottish Marine Protected Areas Project.

<sup>141</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough.

<sup>142</sup> Priede, I.G. 2018. Ibid.

<sup>144</sup> Priede, I.G. 2018. Ibid.

<sup>145</sup> Priede, I.G. 2018. Ibid.

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
			throughout the Northeast Atlantic <sup>143</sup> .		
Burrowed mud (including sea pens)	The pMPA provides the only representation of the feature within the deep sea marine reserve area. Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	There are several sites within Scottish waters where burrowed muds are designated within MPAs <sup>146</sup> with two that are on the boundary with the West of Scotland pMPA (Geikie Slide and Hebridean Slope MPA and Barra Fan and Hebrides Terrace Seamount MPA). This site is not subject to management <sup>147</sup> and therefore, the feature is not protected in offshore sites.	The site has PMFs including sea pens and sea pen and burrowing megafauna communities (which are OSPAR species) and these provide functional links to other features within the deep sea marine reserve that are OSPAR species <sup>148</sup> .	Deep burrowed muds are almost exclusively found in from the northern North Sea and from sea lochs in western Scotland and the Hebrides <sup>149</sup> . The pMPA reflects areas essential for this species.	Burrowed mud can support communities and species such as Seapens and burrowing megafauna in circalittoral fine mud. Whilst additional representation may not be required, some of the supporting communities and species have low population levels for example, fireworks anemone are nationally scarce <sup>150</sup> . In addition, they support OSPAR species. Therefore, the site complements existing protection of dependent features, adding to resilience and provide protection to OSPAR species.
Deep sea sponge aggregations	The proposal provides an area with important concentrations and quantities of sponges <sup>151</sup> . The site provides protection of this	Several sites within or neighbouring the deep sea marine reserve currently include deep sea sponge aggregations as a protected feature	No information available.	The proposed site provides a good quality example of the feature to add to the integrity of the proposals and complement the existing	Deep sea sponge aggregations are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR

<sup>143</sup> Priede, I.G. 2018. Ibid.

<sup>146</sup> JNCC. 2019. Marine Protected Areas in the UK map. Available at: <http://jncc.defra.gov.uk/page-5201>. [Accessed on 05/02/2019]

<sup>147</sup> JNCC. 2018. Geikie Slide and Hebridean Slope MPA. Available at: <http://jncc.defra.gov.uk/page-6481>. [Accessed on 05/02/2019]

<sup>148</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>149</sup> Marine Scotland. 2018. Burrowed mud. Available at: <http://marine.gov.scot/information/burrowed-mud>. [Accessed on 05/02/2019]

<sup>150</sup> Marine Scotland. 2018. Ibid.

<sup>151</sup> JNCC. 2014. Faroe-Shetland sponge belt nature conservation MPA. Available at: [http://jncc.defra.gov.uk/pdf/Faroe-Shetland\\_Sponge\\_Belt\\_Application\\_of\\_the\\_MPA\\_Selection\\_Guidelines\\_v5\\_0.pdf](http://jncc.defra.gov.uk/pdf/Faroe-Shetland_Sponge_Belt_Application_of_the_MPA_Selection_Guidelines_v5_0.pdf). [Accessed on 05/02/2019]



## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
	OSPAR species <sup>152</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	(Rosemary Bank Seamount; Faroe Shetland Sponge Belt) <sup>153</sup> .		protection where the feature is considered to be threatened or declining in Regions III and V.	Commission <sup>154</sup> . Though there are designated sites with the feature listed, there is currently a lack of management within these sites to protect the species.
Offshore deep sea muds	Representative of Scotland's continental slope habitat and deep sea floor <sup>155</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	Several sites within or near the pMPA currently have offshore deep sea muds as a designated feature (Barra Fan and Hebrides Terrace Seamount; Geikie Slide and Hebridean Slope; North-east Faroe-Shetland Channel) <sup>156</sup> .	This habitat provides a variety of functional links with several features and add to the integrity of these proposals and complement the existing protection throughout the sites found in the deep sea marine reserve. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>157</sup> .	Deep sea muds are mainly present in the deeper sections of the Faroe-Shetland Channel and the Rockall Trough and along continental slope habitats. Deep sea muds vary throughout the reserve, dependent on the depth, substrate, topography / current regime and temperature; variations in mud coarseness support different communities <sup>158</sup> .	Additional representation not required to achieve resilience, however the site complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>159</sup> .
Offshore subtidal sands and gravels	Representative of Scotland's continental slope habitat and deep	Several sites that have designated this feature within or near the pMPA:	This habitat provides a variety of functional links with several features and add to the	The pMPA provides a good quality example of the feature to add to the	Additional representation not required to achieve resilience, however the site

<sup>152</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>153</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. JNCC Report No. 625, JNCC, Peterborough, ISSN 0963-8091.

<sup>154</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

<sup>155</sup> Doggett *et al.* 2018. Ibid.

<sup>156</sup> Doggett *et al.* 2018. Ibid.

<sup>157</sup> Doggett *et al.* 2018. Ibid.

<sup>158</sup> Doggett *et al.* 2018. Ibid.

<sup>159</sup> Doggett *et al.* 2018. Ibid.

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs						FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience	
	sea floor <sup>160</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	North-east Faroe-Shetland Channel, Faroe Shetland Sponge Belt and the Geikie Slide and Hebridean Slope <sup>161</sup> .	integrity of these proposals and complement the existing protection throughout the sites found in the deep sea marine reserve. These features include burrowed muds, cold-water coral reefs and deep sea sponge aggregations <sup>162</sup> .	integrity of the proposals and complement the existing protection in several sites already designated in the deep sea reserve area. There are important variations in gravel coarseness throughout the reserve, dependent on the depth, substrate, topography / current regime and temperature; variations in coarseness support different communities <sup>163</sup> .	complements existing protection of the feature in the region, adding to resilience. The habitat type supports many taxa associated with slow growth and long recovery times <sup>164</sup> .	
Seamount communities	MPA proposal would ensure representation of seamounts in OSPAR Region I and V <sup>165</sup> . Additionally, Article 8 of the Regulation (EU) 2016/2336 does not cover distribution of the proposed protected feature above 800m depth.	The feature is currently designated in Rosemary Bank Seamount and Barra Fan and Hebrides Terrace Seamount <sup>166</sup> .	No information available.	Seamount communities are found across the Northeast Atlantic. Different types of seamount communities, and habitats that occur on them, are represented within the pMPA. These include various non-reef forming corals, individual	Seamount communities are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR Commission <sup>168</sup> . Therefore, the proposed MPA provides additional protection for an OSPAR species, which supports many other proposed features.	

<sup>160</sup> Doggett *et al.* 2018. Ibid.

<sup>161</sup> Doggett *et al.* 2018. Ibid.

<sup>162</sup> Doggett *et al.* 2018. Ibid.

<sup>163</sup> Doggett *et al.* 2018. Ibid.

<sup>164</sup> Doggett *et al.* 2018. Ibid.

<sup>165</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>166</sup> Doggett *et al.* 2018. Ibid.

<sup>168</sup> JNCC. 2018. Rosemary Bank Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6486>. [Accessed on 05/02/2018]

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
				sponges, bivalves or bryozoans <sup>167</sup> .	
Seamounts	MPA proposal would ensure representation of seamounts in OSPAR Region and V <sup>169</sup> .	The feature is currently protected in two sites (Rosemary Bank Seamount and Barra Fan and Hebrides Terrace Seamount). The proposal would ensure replication of this feature in regions I and V.	Seamounts within the pMPA are recommended because they protect several OSPAR Region I and V features, which are protected in the deep sea marine reserve area, such as orange roughy <sup>170</sup> . They also harbour listed species e.g. <i>Lophelia pertusa</i> <sup>171</sup> .	The pMPA provides a good quality example of the feature to add to the integrity of the proposals and complement the existing protection in several sites already designated in Region I and V.	Seamounts are considered to be Threatened and/or Declining across the North-east Atlantic by the OSPAR Commission <sup>172</sup> . Therefore, the proposed MPA provides additional protection for an OSPAR species, which supports many other proposed features.
Blue Ling ( <i>Molva dypterygia</i> )	Provides representation of a commercially important species, covering its key spawning grounds <sup>173</sup> .	This feature is protected in sites: Rosemary Bank and West of Scotland <sup>174</sup> .	Rockall Trough provides important areas for spawning blue ling, which may be a critical source of juveniles throughout the deep sea marine reserve and surrounding seas as studies have shown that larvae are	There is one stock of Blue ling in the area (the southern stock), which is found from Faroes to the west of Scotland. The proposed area contains important spawning ground for the species <sup>176</sup> .	The stock is not overfished <sup>177</sup> but is vulnerable to targeted fishing on spawning aggregations <sup>178</sup> . Existing protection of this feature will add to resilience of the species by protecting spawning habitat, which has

<sup>167</sup> JNCC. 2018. Supplementary Advice on Conservation Objectives for Rosemary Bank Seamount Nature Conservation Marine Protected Area Available at: [http://jncc.defra.gov.uk/pdf/RBS\\_SACO\\_V1.0.pdf](http://jncc.defra.gov.uk/pdf/RBS_SACO_V1.0.pdf)

<sup>169</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>170</sup> Doggett *et al.* 2018. Ibid.

<sup>171</sup> Davies, J. S., Stewart, H. A., Narayanaswamy, B. E., Jacobs, C., Spicer, J., Golding, N., & Howell, K. L. 2015. Benthic Assemblages of the Anton Dohrn Seamount (NE Atlantic): Defining Deep-Sea Biotopes to Support Habitat Mapping and Management Efforts with a Focus on Vulnerable Marine Ecosystems. PloS one, 10(5), e0124815. doi:10.1371/journal.pone.0124815

<sup>172</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>173</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough

<sup>174</sup> Marine Scotland. 2018. Scottish MPA network - Parliamentary Report.

<sup>176</sup> Priede, I.G. 2018. Ibid.

<sup>177</sup> ICES. 2018. Blue ling (*Molva dypterygia*) in subareas 6–7 and Division 5.b (Celtic Seas, English Channel, and Faroes grounds). Published 7 June 2018

<sup>178</sup> Priede, I.G. 2018. Ibid.

## Appendix C: Site Assessment Tables

Table 8. Overview of MPA interest features for which designation and management have been proposed and how these contribute to an ecologically coherent network of MPAs					FWC
Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
			carried by the current to other areas within its range <sup>175</sup> .		been shown to supply surrounding areas <sup>179</sup> .
Orange roughy ( <i>Hoplostethus atlanticus</i> )	The proposal provides representation of an OSPAR List of threatened and/or declining species and habitats and represents a mobile feature, where the proposed area may afford protection for its functional habitats, such as coral <sup>180</sup> .	Only represented within one site (Barra Fan and Hebrides Terrace Seamount MPA) <sup>181</sup> . Therefore, the proposal would allow further replication for this species. Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature) and there is a zero TAC for the species across the Northeast Atlantic.	Rockall Trough provides important areas for spawning orange roughy and the site may be of critical importance as a source of juveniles for the deep sea marine reserve and surrounding seas <sup>182</sup> .	In the North Atlantic, the feature inhabits continental slopes in the Mid-Ocean Ridge and around offshore banks in its preferred depths. Different parts of the site support orange roughy at various life stages, for example, larger fish are generally found on hills, while juveniles are found over flatter grounds <sup>183</sup> .	This feature is considered to be threatened and/or declining by the OSPAR Commission <sup>184</sup> . The proposed site will likely afford greater protection to this recovering species, as it is considered as a critical source of juveniles for surrounding waters <sup>185</sup> .
Portuguese dogfish ( <i>Centroscymnus coelolepis</i> )	The pMPA ensures representation of the feature in OSPAR Region V <sup>186</sup> .	There are no other protected sites in the area for this feature, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the	It is unknown if the Portuguese dogfish stock in this area is genetically distinct but there is evidence to show that the feature use the Rockall Trough for all or parts of their lifecycle.	The feature is found globally, however, the feature is resident in the deep sea marine reserve and the area serves as a potential breeding ground	This feature is considered to be threatened and/or declining by the OSPAR Commission <sup>189</sup> and the feature likely use all or part of the site for its entire

<sup>175</sup> Priede, I.G. 2018. Ibid.

<sup>179</sup> Priede, I.G. 2018. Ibid.

<sup>180</sup> Priede, I.G. 2018. Ibid.

<sup>181</sup> JNCC. 2018. Barra Fan and Hebrides Terrace Seamount MPA. Available at: <http://jncc.defra.gov.uk/page-6489>. [Accessed on 05/02/2019]

<sup>182</sup> Priede, I.G. 2018. Ibid.

<sup>183</sup> Priede, I.G. 2018. Ibid.

<sup>184</sup> Priede, I.G. 2018. Ibid.

<sup>185</sup> Priede, I.G. 2018. Ibid.

<sup>186</sup> OSPAR. 2019. List of Threatened and/or Declining Species & Habitats. Available at: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>. [Accessed on 05/02/2019]

<sup>189</sup> OSPAR. 2019. Ibid.

## Appendix C: Site Assessment Tables

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Feature Name	Representation	Replication	Linkages	Geographic Range and Variation	Resilience
		known distribution of the proposed protected feature).	However, previous studies have suggested that the site is important for adult mating and subsequently pregnant females migrate to the pupping grounds in West Africa <sup>187</sup> . Therefore, there may be important linkages with other fisheries.	for the species and important adult mating area. The whole lifecycle may be conducted in single areas such as those found in the deep sea marine reserve <sup>188</sup> .	lifecycle <sup>190</sup> . Therefore, this site would provide important protection to the feature in Region V.
Roundnose grenadier ( <i>Coryphaenoides rupestris</i> )	The proposal provides representation of important spawning grounds <sup>191</sup> for the feature that would not otherwise be included within the network.	There are no other protected sites in the area for this feature, however, Article 8 of the Regulation (EU) 2016/2336 overlaps with the majority of the known distribution of the proposed protected feature).	There are separate populations North and South of the Wyville Thompson Ridge. It is unknown how genetically distinct the feature's populations are but the Rockall Trough provides important areas for spawning and may be of critical importance as a source of juveniles within the area and for surrounding seas. Roundnose grenadier have a pelagic reproductive strategy and therefore, there is potential for linkage with areas outside of the deep sea marine reserve <sup>192</sup> .	The feature is widespread in North Atlantic slopes, however, the provides "optimal habitat for feeding, growth and spawning" <sup>193</sup> .  There are several populations found in the deep sea marine reserve. In the North of the Faroe-Shetland Channel, the species is replaced by the roughnose grenadier ( <i>Macrourus berglax</i> ) <sup>194</sup> .	The stock is not overfished (above $B_{MSYTrigger}$ but below $B_{MSY}$ <sup>195</sup> ). The pMPA will benefit the feature as it uses the Rockall Trough for all or part of its life cycle and protects important spawning habitats for the species

<sup>187</sup> Priede, I.G. 2018. Ibid.

<sup>188</sup> Priede, I.G. 2018. Ibid.

<sup>190</sup> Priede, I.G. 2018. Ibid.

<sup>191</sup> Priede, I.G. 2018. Ibid.

<sup>192</sup> Priede, I.G. 2018. Ibid.

<sup>193</sup> Priede, I.G. 2018. Ibid.

<sup>194</sup> Priede, I.G. 2018. Ibid.

<sup>195</sup> ICES. 2018. Roundnose grenadier (*Coryphaenoides rupestris*) in subareas 6 and 7 and divisions 5.b and 12.b (Celtic Seas and the English Channel, Faroes grounds, and western Hatton Bank). Published 7 June 2018. Available at: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/rng.27.5b6712b.pdf>

## C.3.7 Anticipated Impacts on Ecosystem Services

Table 9a. Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									FWC
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Benefits	Confidence
				Lower	Intermediate	Upper			
Fish and shellfish for human consumption	Moderate, important spawning sites <sup>196</sup>	On-site and off-site	Many stocks' biomass are not at MSY	Nil	Deep sea species to benefit from protection	Moderate, spawning areas for commercial species such as anglerfish and key habitats e.g. for elasmobranchs	Low	Moderate	
Fish and shellfish for non-human consumption			Stocks reduced from potential maximum						
Climate regulation	Moderate - high, carbon storage in deep sea habitats	On-site	Uncertain but potentially important services	Minimal			Moderate	Minimal	Moderate
Waste breakdown/detoxification	Low	On-site	Low - moderate	Minimal			Low	Minimal	Low
Non-use value of natural environment	Moderate, deep sea features (e.g. sponges) and sites, have non-use value	On-site	Non-use value of the site may decline	Moderate, protection of features of site from potential future decline			Low–Moderate, protection of features is valued non-users	Moderate	Moderate, extent of features, and value to society all uncertain
Research and Education	Moderate, a number of biological features have research value, such as deep sea species <sup>197</sup>	On-site	Value of site may decline	Low, protection of key characteristics of site from decline, improving future research opportunities			Moderate	Low - Moderate	Low, extent to which research uses site in future uncertain.
Genetic Resources									
Supporting services	High	On-site and off-site	Moderate	Designation and management reduces risks of future decline			Moderate	Low	Moderate

<sup>196</sup> Priede, I.G. 2018. Deep-sea Fishes Literature Review. JNCC Report No. 619. JNCC, Peterborough. ISSN 0963-8091

<sup>197</sup> Doggett, M., Baldock, B. & Goudge, H. 2018. A review of the distribution and ecological importance of seabed communities in the deep waters surrounding Scotland. *JNCC Report No. 625*, JNCC, Peterborough, ISSN 0963-8091.

## Appendix C: Site Assessment Tables

Table 9a. Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)								FWC	
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Benefits	Confidence
				Lower	Intermediate	Upper			
Total value of changes in ecosystem services		On site & off-site	Moderate	Low - Moderate				Low - moderate	Low

Table 9b. Summary of Ecosystem Services Costs arising from the Designation and Management of the Site as an MPA (Over 2019 to 2038 Inclusive)									FWC
Services	Relevance to Site	On-site / Off-site	Baseline Level	Estimated Impacts of Management			Value Weighting	Scale of Costs	Confidence
				Lower	Intermediate	Upper			
No costs are expected to arise. The scale of fisheries impacts is considered to be too small for changes in fishing gear to occur, or for displacement of fishing effort, to have any noticeable impacts on ecosystem services outside the site									



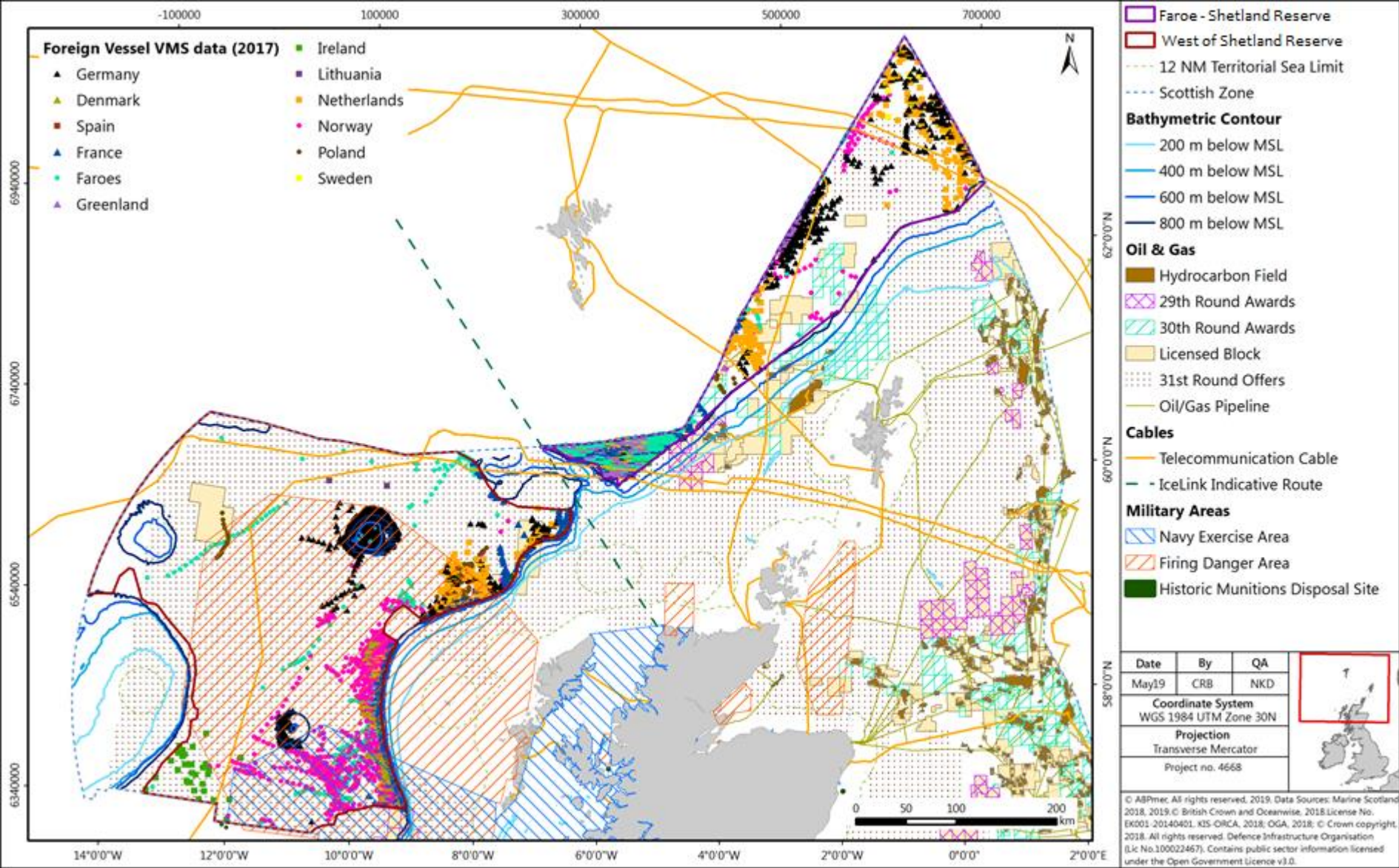


Figure C5 All sector activities in the assessed Faroe-Shetland and West of Scotland reserve (excluding UK commercial fisheries)



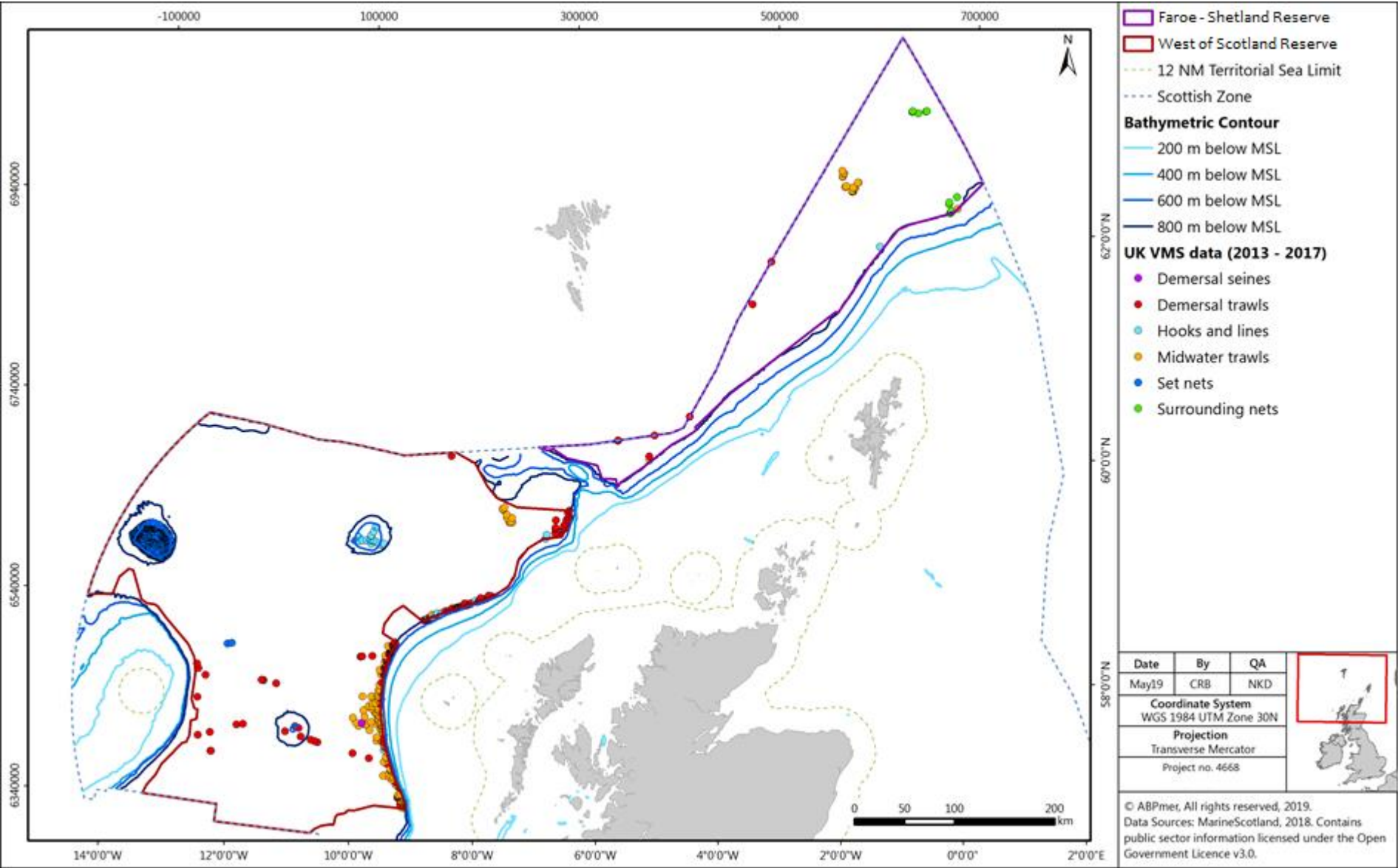


Figure C6 Commercial fisheries VMS data for the assessed Faroe-Shetland and West of Scotland reserve (UK vessels)