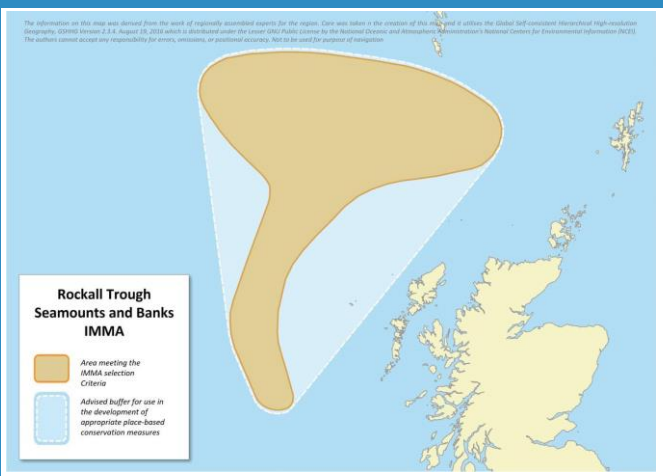

Area Size

106 464 km²

Qualifying Species and Criteria

Sperm whale – *Physeter macrocephalus*

Criterion A

Sei whale – *Balaenoptera borealis*

Criterion A

Blue whale – *Balaenoptera musculus*

Criterion A

Fin whale – *Balaenoptera physalus*

Criterion A

Marine Mammal Diversity

Criterion D (2)

Balaenoptera borealis, Balaenoptera musculus, Balaenoptera physalus, Globicephala melas, Hyperoodon ampullatus, Mesoplodon bidens, Megaptera novaeangliae, Physeter macrocephalus, Ziphius cavirostris

Rockall Trough Seamounts and Banks IMMA

Summary

This IMMA encompasses the waters around the seamount complex of the Rockall Trough, which has depths extending down to around 2000 m. The area includes the Anton Dohrn and Hebrides Terrace seamounts which rise steeply to depths of approx. 500m as well as Rosemary Bank, Bill Bailey's Bank, Lousy Bank and the Wyville-Thompson ridge (at depths of 400 m). These deep seamounts and ridges are known high-use habitats for deep-diving beaked whales and sperm whales (*Physeter macrocephalus*) that are considered Vulnerable on the IUCN Red List. The bathymetry and water currents within this area also encourage upwelling which can drive productivity that attracts baleen whales. The area experienced heavy whaling in the early 20th century, and today this habitat supports recovering populations of Endangered blue (*Balaenoptera musculus*) and sei whales (*Balaenoptera borealis*) and Vulnerable fin whales (*Balaenoptera physalus*).

Description:

The deep trough that lies between Britain and Rockall, a granite islet 300 km west of Soay, Scotland is an important feature in determining deep water circulation in the eastern North Atlantic (Ellett et al., 1983). West of the Outer Hebrides, the ocean floor slopes away steeply to the Rockall Trough which reaches a maximum depth of about 2000 m. The North Atlantic current passes northwards creating upwellings around the Anton Dohrn Sea Mount (which rises to 530 m depth), Hebrides Terrace Sea Mount (rising to about 980 m), and Rosemary Bank in

the west, and the Ymir Ridge and Wyville-Thompson Ridge which form a shallower northern boundary (to 400 m depth) of the area.

The north-eastwards flowing North-Atlantic drift interacts with this deep water in a complex and turbulent manner. This turbulence forces deeper water, richer in nutrients, towards the surface where it enhances productivity. Similar turbulence caused by the steep sides of the offshore banks and sea mounts can enhance primary productivity over distances of several hundred metres. The open ocean is exposed to wind, and gales are frequent with big seas built up by the prevailing westerlies, resulting in the regular mixing of the surface layers and the dispersal of plankton and fish.

The combination of water masses in this area is unique in the North Atlantic, and it is the internal tides, substrate heterogeneity and oceanographic interfaces that are thought to enhance biological diversity on these seamounts (Henry et al., 2014). These deep-water banks are generally rocky, and stony areas supporting diverse communities of deep-water sponges, soft corals and invertebrates (Bett, 2001). Gelatinous animals and planktonic crustaceans dominate the fauna of the surface waters, whereas at >300 m depth, various species of cephalopod may aggregate, forming prey patches for several species of deep-diving marine mammals.

Several marine protected areas (SACs and SPAs) have been established in the region, either incorporated into UK law as Marine Protected Areas under the Conservation of Species and Habitats Regulations (2017) or as designated OSPAR offshore MPAs. These include the Anton Dohrn Seamount, Barra Fan and Hebrides Terrace Seamount, East and Northwest Rockall Banks, Rosemary Bank Seamount, Wyville Thomson Ridge, and Darwin Mounds.

Figure 1: Sperm whale (*Physeter macrocephalus*). Photo credit: PGH Evans

Figure 2: Fin whale (*Balaenoptera physalus*). Photo credit: PGH Evans

Figure 3: Sei whales (*Balaenoptera glacialis*). Photo credit: C Weir

Figure 4: Blue whale (*Balaenoptera musculus*). Photo credit: PGH Evans

Criterion A: Species or Population Vulnerability

The IMMA is identified on the basis of important habitat for several species. These include sperm whales (*Physeter macrocephalus*), which are listed as vulnerable on the IUCN Red List of Threatened Species (Taylor et al., 2019).

The area also supports several baleen whale species. The fin whale (*Balaenoptera physalus*) is listed as vulnerable on the IUCN Red List of Threatened Species (Cooke, 2018a). The sei whale (*Balaenoptera glacialis*) and blue whale (*Balaenoptera musculus*) are currently listed as endangered on the IUCN Red List of Threatened Species (Cooke, 2018b, 2018c).

Whaling data from Scottish whaling stations (1903-1951) have demonstrated the importance of this region for these baleen whale species as well as for sperm and northern bottlenose whales (Thompson, 1928; Brown, 1976; Ryan et al., 2022), and recent surveys confirm their continued presence in the area (Weir et al., 2001; Pollock et al., 2000; Rogan et al., 2018; Berrow et al., 2018; Evans & Waggitt, 2020; Lacey et al., 2022). There is also acoustic data showing the regular presence of blue, fin, and humpback whales in this area (Charif et al., 2001; Charif & Clark, 2009).

Although not assessed as threatened on the IUCN Red List, beaked whales in this area are of particular concern due to large mortality events potentially associated with sonar exposure. An unexplained mortality event of beaked whales: Cuvier's (*Ziphius cavirostris*), Sowerby's (*Mesoplodon bidens*) and northern bottlenose whales (*Hyperoodon ampullatus*) occurred adjacent to this region with 118 beaked whales stranded along the western UK seaboard in 2018 (SMASS, 2018), compared to a mean annual

Figure 5: Long-finned pilot whale (*Globicephala melas*). Photo credit: PGH Evans

record of 5 beaked whales stranding for the four preceding years.

Criterion D: Special Attributes
Sub-criterion D2: Diversity

The IMMA hosts deep-diving sperm whales, northern bottlenose whales, Cuvier's beaked whale, Sowerby's beaked whale, long-finned pilot whales (*Globicephala melas*), which are often found along the continental slope in association with topographic singularities such as canyons, banks and seamounts that are within reach of their diving ability. Various studies have documented high numbers of sightings and relative abundance for these species in the IMMA (Weir et al., 2001; Boisseau et al., 2011; Rogan et al., 2017; Berrow et al., 2018; Evans & Waggitt, 2020; Lacey et al., 2022). All of these species dive to over 650 m and use echolocation to locate their prey, generally deep-water cephalopods. Pilot whales undertake deep dives just after sunset as the deep-scattering layer ascends, whereas beaked and sperm whales dive throughout the day. Beaked whales are thought to forage benthically leaving marks observed at seamounts (Woodside et al., 2006). Within the Ziphiidae and Physeteridae, the highest predicted densities based on habitat modelling in the eastern North Atlantic are also along the Trough and Shelf edge of this IMMA (Virgili et al., 2018).

The topographic features and currents around the seamounts and banks in the Rockall Trough create dynamic frontal zones and eddies which support densities of copepods that are also of interest for sei whales, blue whales, fin whales and humpback whales (Ryan et al., 2022), which are frequently documented in visual surveys (Rogan et al., 2017; Berrow et al., 2018; Evans & Waggitt, 2020; Lacey et al., 2022) as well as by acoustic data (Charif et al., 2001; Charif & Clark, 2009).

There are even some reports of critically endangered North Atlantic right whales (*Eubalaena glacialis*) in the area (O'Cadhla et al., 2004; Evans & Waggitt, 2020).

Supporting Information

Berrow, S.D., O'Brien, J., Meade, R., Delarue, J., Kowarski, K., Martin, B., Moloney, J., Wall, D., Gillespie, D., Leaper, R., Gordon, J., Lee, A., and Porter, L. 2018. Acoustic Surveys of Cetaceans in the Irish Atlantic Margin in 2015–2016: Occurrence, distribution and abundance. Department of Communications, Climate Action & Environment and the National Parks and Wildlife Service (NPWS), Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland, 348pp.

Bett, B.J. 2001. UK Atlantic Margin Environmental Survey: Introduction and overview of bathyal benthic ecology. Continental Shelf Research 21: 917–956.

Boisseau, O., Moscrop, A., Cucknell, A., McLanaghan, R., and Wall, D. 2011. An acoustic survey for beaked whales in the Rockall Trough. SC-63-SM2. Available at: https://iwc.int/private/downloads/mj61BVmcoeF7tzSg1vjc6A/SC-63-SM2.pdf.

Brown, S.G. 1976. Modern whaling in Britain and the north-east Atlantic Ocean. Mammal Review, 6: 25-36.

Charif, R.A. and Clark, C.W. 2009. Acoustic monitoring of large whales in deep waters north and west of the British Isles, 1996-2005. Cornell Lab of Ornithology Technical Report 08-07. 40pp.

Charif, R.A., Clapham. P.J. and Clark, C.W. 2001. Acoustic detections of signing humpback whales in deep waters off the British Isles. Marine Mammal Science, 17(4): 751-768.

Cooke, J.G. 2018a. *Balaenoptera physalus*. The IUCN Red List of Threatened Species 2018: e.T2478A50349982.https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2478A50349982.en. Accessed on 11 April 2023.

Cooke, J.G. 2018b. *Balaenoptera borealis*. The IUCN Red List of Threatened Species 2018: e.T2475A130482064. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2475A130482064.en. Accessed on 12 April 2023.

Cooke, J.G. 2018c. *Balaenoptera musculus* (errata version published in 2019). The IUCN Red List of Threatened Species 2018: e.T2477A156923585. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2477A156923585.en. Accessed on 25 May 2023.

Ellett, D.J., Kruseman, P., Prangsma, G.J., Pollard, R.T., Vanaken, H.M., Edwards, A., Dooley, H.D., and Gould, W.J. 1983. Water masses and mesoscale circulation of North Rockall Trough waters during JASIN 1978. Phil Trans R. Soc. Lond A., 308: 231-252.

Evans, P.G.H. and Waggitt, J.J. 2020. Cetaceans. Pp. 134-184. In: Crawley, D., Coomber, F., Kubasiewicz, L., Harrower, C., Evans, P., Waggitt, J., Smith, B., and Mathews, F. (Editors) *Atlas of the Mammals of Great Britain and Northern Ireland*. Published for The Mammal Society by Pelagic Publishing, Exeter. 205pp.

Henry, L-A., Vad, J., Findlay, H.S., Murillo, J., Milligan, R., and Roberts, J.M. 2014. Environmental variability and biodiversity of megabenthos on the Hebrides Terrace Seamount (Northeast Atlantic). Scientific Reports 4, 5589 (2014). https://doi.org/10.1038/srep05589.

Lacey, C., Hammond, P.S., Gilles, A., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J., Vingada, J., Viquerat, S., and Øien, N. 2022. Modelled density surfaces of cetaceans in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard

surveys. SCANS-III project report 2. Available at: https://scans3.wp.st-andrews.ac.uk/files/2022/08/SCANS-III_density_surface_modelling_report_final_20220815.pdf.

Mackey, M., Perales i Giménez, D. and Cadhla, O.O. SEA678 Data Report for Offshore Cetacean Populations (Report). Coastal & Marine Resources Centre. Pdf available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/197025/SEA678_Cetaceans.pdf.

O'Cadhla, O., Mackey, M., Aguilar de Soto, A., Rogan, E., and Connolly, N. 2004. Cetaceans and Seabirds of Ireland's Atlantic Margin. Volume II. Cetacean Distribution & Abundance. Report on research carried out under the Irish Infrastructure Programme (PIP) Rockall Studies Group (RSG) projects 98/6 and 00/13, Porcupine Studies Group project P00/15 and Offshore Support Group (OSG) project 99/38. 82pp. Available at: https://cetaceos.webs.ull.es/papers/2004/2004.CetaceansandseabirdsofIrelandsAtlanticmargin.pdf.

Paxton, C.G.M., Scott-Hayward, L.A.S. and Rexstad, E. 2014. Statistical Approaches to Aid the Identification of Marine Protected Areas with Regard to Minke Whale, Risso's Dolphin, White-Beaked Dolphin and Basking Shark. Scottish Natural Heritage Commissioned Report No. 594. 132pp.

Pollock, C.M., Mavor, R., Weir, C.R., Reid, A., White, R.W., Tasker, M.L., Webb, A., and Reid, J.B. 2000. The distribution of seabirds and Marine Mammals in the Atlantic Frontier, north and west of Scotland. Joint Nature Conservation Committee, Aberdeen. 92pp.

Rogan, E., Cañadas, A., Macleod, K., Santos, M.B., Mikkelsen, B., Uriarte, A., Van Canneyt, O., Vázquez, J.A., and Hammond, P.S. 2017. Distribution, abundance and habitat use of deep diving cetaceans in the North-East Atlantic. Deep–Sea Research Part II, 141: 8–19.

Rogan, E., Breen, P., Mackey, M., Cañadas, A., Scheidat, M., Geelhoed, S., and Jessopp, M. 2018. Aerial surveys of cetaceans and seabirds in Irish waters: Occurrence, distribution and abundance in 2015-2017. Department of Communications, Climate Action & Environment and National Parks and Wildlife Service (NPWS), Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland. 297pp.

Ryan, C., Calderan, S., Allison, C., Leaper, R. and Risch, D. 2022. Historical occurrence of whales in Scottish Waters inferred from whaling records. Aquatic Conserv: Mar Freshw Ecosyst., 32:1675–1692.

SMASS. 2018. Annual Report for Marine Scotland, Scottish Government.

Taylor, B.L., Baird, R., Barlow, J., Dawson, S.M., Ford, J., Mead, J.G., Notarbartolo di Sciara, G., Wade, P., and Pitman, R.L. 2019. *Physeter macrocephalus* (amended version of 2008 assessment). The IUCN Red List of Threatened Species 2019: e.T41755A160983555. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41755A160983555.en. Accessed on 11 April 2023.

Thompson, D.A. 1928. On whales landed at the Scottish whaling stations during the years 1908-1914 and 1920-1927. Sci Invest Fish Bd Scott 3. 3-40.

Virgili, A., Authier, M., Boisseau, O., et al. 2019. Combining multiple visual surveys to model the habitat of deep-diving cetaceans at the basin scale. Global Ecol Biogeogr., 28:300–314. https://doi.org/10.1111/geb.12850.

Weir, C.R., Pollock, C., Cronin, C., and Taylor, S. 2001.

Cetaceans of the Atlantic Frontier, north and west of Scotland. Continental Shelf Research, 21: 1047-1071.

Woodside, J.M., David, L., Frantzis, A., and Hooker, S.K. 2006. Gouge marks on deep-sea mud volcanoes in the eastern Mediterranean: Caused by Cuvier's beaked whales? Deep-Sea Res Part I-Oceanogr Res Pap 53:1762-1771.

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PDF made available for download at ***https://www.marinemammalhabitat.org/factsheets/rockall-trough-seamounts-and-banks-imma/***