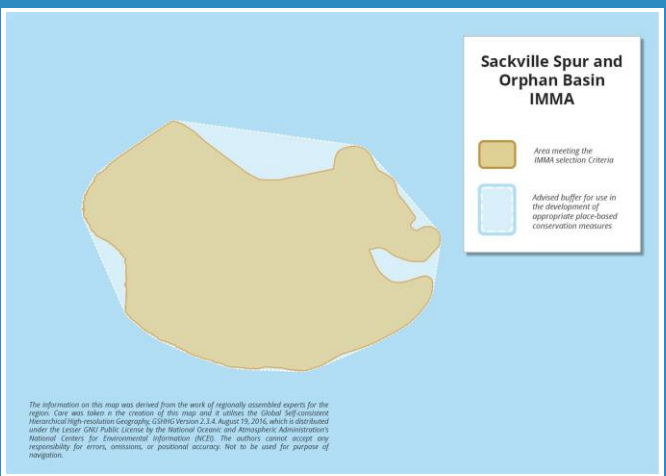

Area Size

115,402 km^2

Qualifying Species and Criteria

Sei whale – *Balaenoptera borealis*

Criterion A

Blue Whale – *Balaenoptera musculus*

Criterion A

Fin Whale – *Balaenoptera physalus*

Criterion A

Long-finned Pilot Whale – *Globicephala melas*

Criterion B (2)

Northern Bottlenose Whale – *Hyperoodon ampullatus*

Criterion B (2); C (2)

Sperm Whale – *Physeter macrocephalus*

Criterion A; B (2); C (2)

Sowerby's Beaked Whale – *Mesoplodon bidens*

Criterion B (2); C (2)

Criterion D (2) - Marine Mammal Diversity

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

Sackville Spur and Orphan Basin IMMA

Other Marine Mammal Species Documented

Delphinus delphis, Lagenorhynchus albirostris, Orcinus orca, Phocoena phocoena, Tursiops truncatus

Summary

The Sackville Spur-Orphan Basin IMMA lies off the northeastern corner of the Grand Banks of Newfoundland. The area includes the Sackville Spur, a long but narrow ridge extending northeastward from the Grand Banks, the Orphan Knoll, an undersea peak rising to about 1,800 m from the surface, as well as the shelf edge region and Orphan Basin which lie to the west of the Spur and southwest of the Knoll. The IMMA hosts Endangered blue whales (*Balaenoptera musculus*) and sei whales (*Balaenoptera borealis*), and Vulnerable fin (*Balaenoptera physalus*) and sperm (*Physeter macrocephalus*) whales. Aggregations of sperm whales, northern bottlenose whales (*Hyperoodon ampullatus*) and pilot whales (*Globicephala melas*) have been documented, all of which likely use the productive waters for feeding along with other species, including Sowerby's beaked whales (*Mesoplodon bidens*). A high diversity of at least 11 species of marine mammals regularly occurs in the area. The area overlaps with the "Orphan Spur" EBSA.

Description:

The Sackville Spur-Orphan Basin IMMA is located off the northeastern corner of the Grand Banks of Newfoundland. It includes the Sackville Spur, an elongate raised sediment drift feature that extends northeastward from the Grand Banks, as well as the shelf-edge region and Orphan Basin which lie to the

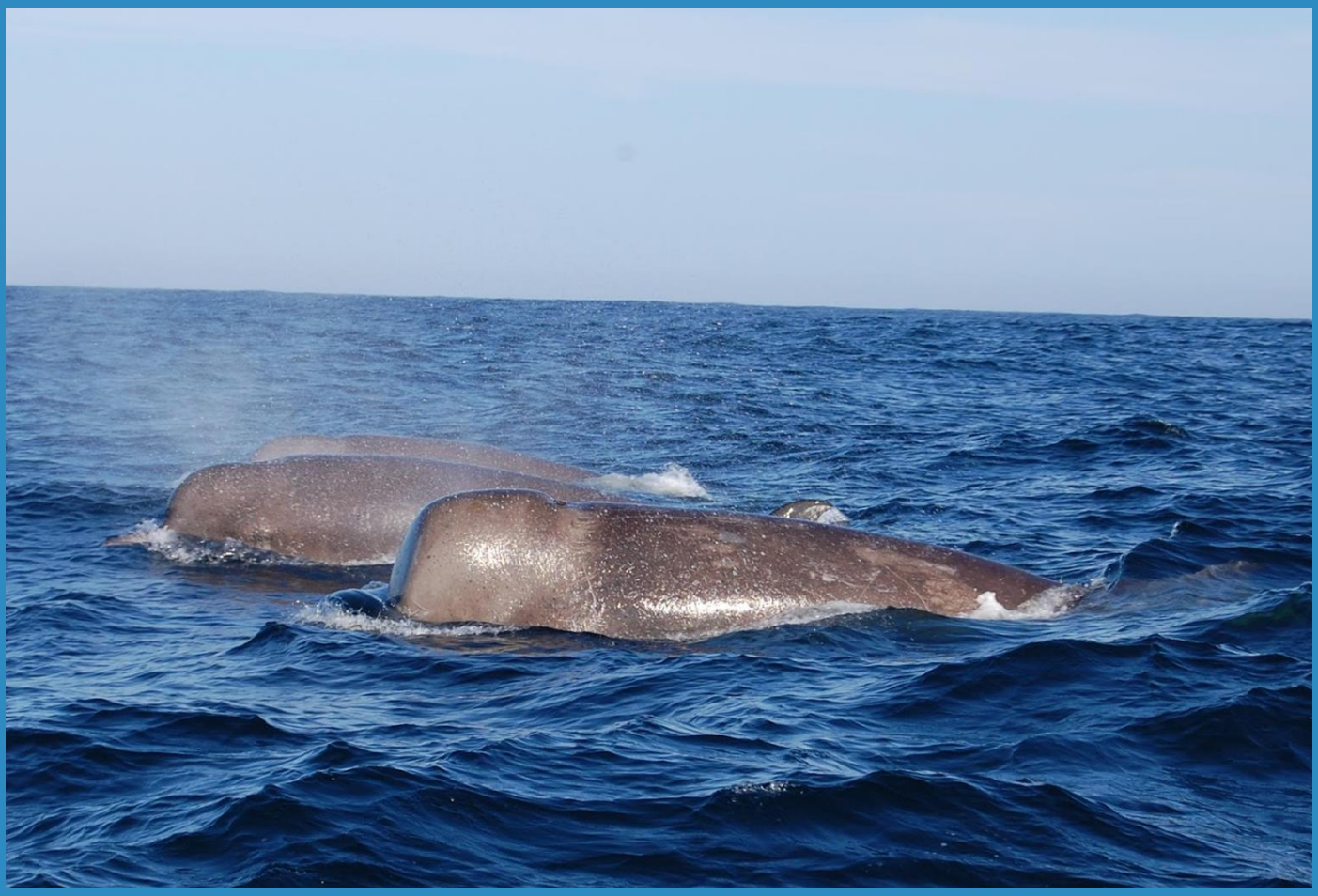

Figure 1: A group of northern bottlenose whales (*Hyperoodon ampullatus*) at the surface. Aggregations of northern bottlenose whales have been documented in the Sackville Spur-Orphan Basin IMMA, among several other odontocete species. Photo credit: H. Moors-Murphy.

Figure 2: Ariel view of a fin whale (*Balaenoptera physalus*) mom and calf pair. Multiple baleen whale species have been documented in the Sackville Spur-Orphan Basin IMMA. Photo credit: David Gaspard.

west of the Spur. In the northeast part is the Orphan Knoll, an undersea peak rising to about 1,800 m from the surface. The IMMA extends about 450 km east to west and 350 km north to south. Apart from the steeper northwestern edge of the Sackville Spur, the area has a generally smooth bottom between 500-3,200 m deep. The area is under the strong influence of the cold Labrador Current, which likely has an important role in its exceptional productivity (Maillet et al., 2006). Fishing and oil and gas development affect the area although there is protection from benthic fishing for the remarkable sponge (Porifera) grounds along the Sackville Spur. The area overlaps with the "Orphan Spur" EBSA .

Criterion A: Species or Population Vulnerability

The blue (*Balaenoptera musculus*) and sei whale (*Balaenoptera borealis*) are listed as Endangered on the Red List globally (Cooke, 2018a, b), and the fin whale (*Balaenoptera physalus*) and sperm whale (*Physeter macrocephalus*) are both listed as Vulnerable on the Red List globally (Cooke, 2018c; Taylor et al., 2019).

Criterion B: Distribution and Abundance Sub-criterion B2: Aggregations

Sighting rates of groups (per hour equivalent in excellent conditions) from a 12 m research sailing vessel between 2001-2017 from June to August were considerably higher in and around the Sackville Spur-Orphan Basin region (149 hours effort) than other areas along the edge of the Newfoundland Shelf (140 hours effort) for the following species: pilot whales (*Globicephala melas*; 0.355 vs 0.043); northern bottlenose whales (*Hyperoodon ampullatus;* 0.194 vs 0.000); sperm whales (0.321 vs 0.036) (Whitehead & Feyrer, unpublished). Additionally, a comprehensive habitat analysis identified this region as the second most important year-round habitat for northern bottlenose whales in the western North Atlantic after the eastern canyons region of the Scotian Shelf, and also highlighted this area as part of important habitat for Sowerby's beaked whales (*Mesoplodon bidens*; Feyrer et al., 2024). An analysis of 25 acoustic recorders deployed off eastern Canada between May 2015 and November 2017 identified the Sackville Spur area as especially important for northern bottlenose whales year-round with northern bottlenose whale foraging clicks detected on 25-75% of recording days for two hydrophones deployed in the eastern and western ends of the area in all four seasons (Delarue et al., 2024). Drivers of enhanced densities of marine mammals in the Sackville Spur-Orphan Basin region are not clear, but likely relate to the cold, southeast-flowing Labrador Current interacting with the complex bathymetry on the northeast corner of the Grand Banks (Maillet et al., 2006).

Criterion C: Key Life Cycle Activities Sub-criterion C2: Feeding Areas

The strong, cold Labrador Current which flows southeast along the edge of the continental shelf off Labrador and northeast Newfoundland creates highly productive conditions when it encounters the rises of the Sackville Spur and Orphan Knoll at the northeast corner of the Grand Banks (Maillet et al., 2006). Northern bottlenose whales and sperm whales have been frequently observed feeding in the Sackville Spur region (Hal Whitehead, pers. comm). Northern bottlenose whales and Sowerby's beaked whales were also acoustically detected foraging in the area year-round (Delarue et al., 2024; Feyrer et al., 2024).

Criterion D: Special Attributes Sub-criterion D2: Diversity

With regular presence of more than 11 marine

Figure 3: Ariel view of a group of sperm whale (*Physeter macrocephalus*) sighted within the Sackville Spur-Orphan Basin IMMA. Photo credit: David Gaspard.

mammal species, this area supports a high species diversity. This is evidenced by a concentration of cetacean sighting records of free-swimming cetaceans collected during the post-whaling period (1975 – 2015) (Gomez et al., 2020). As discussed above, sighting rates from vessel-based surveys conducted over multiple years within this area were found to be higher for northern bottlenose, Sowerby's beaked, sperm, and pilot whales than other deep-water areas off Newfoundland (Whitehead & Feyrer, unpublished). Multi-year passive acoustic monitoring efforts within the area also demonstrate regular presence of the echolocation (foraging) clicks of these species as well as Cuvier's beaked whales (*Ziphius cavirostris*) (Delarue et al., 2024; Feyrer et al., 2024). Minke whales (*Balaenoptera a. acutorostrata*) and Atlantic white-sided dolphins (*Leucopleurus acutus*) have also been

reported within the area (Gomez et al., 2020). Data from passive acoustic monitoring also provides evidence for the regular presence of baleen whales in this area, especially fin whales throughout most of the year, blue whales in fall and winter and humpback whales (*Megaptera novaeangliae*) in winter (Delarue et al., 2022). Sei whales were mainly heard in the autumn (Macklin 2022). There are more occasional sightings of other species such as killer whales (*Orcinus orca*), common dolphins (*Delphinus delphis*), bottlenose dolphins (*Tursiops truncatus*), white-beaked dolphins, (*Lagenorhynchus albirostris*), and harbour porpoises (*Phocoena phocoena*) (Gomez et al., 2020).

Supporting Information

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