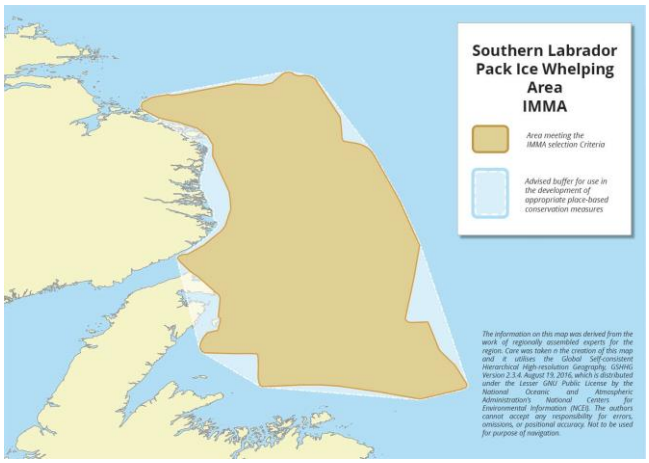
Southern Labrador Pack Ice Whelping Area IMMA



Area Size

78,436 km²

Qualifying Species and Criteria

Hooded seal – *Cystophora cristata*

Criterion A; C (1)

Polar Bear – *Ursus maritimus*

Criterion A; C (2)

Harp seal – *Pagophilus groenlandicus*

Criterion C (1)

Summary

The Southern Labrador Pack Ice IMMA is located off the coast of southern Labrador and northeastern Newfoundland, from south of Hamilton Inlet, to north of Notre Dame Bay. The boundary of the IMMA extends from the coast to approximately 150 nautical miles offshore although the exact location of the pack ice within it varies among and within years. This area is critical for pupping and breeding of Northwest Atlantic harp seals (*Pagophilus groenlandicus*) and hooded seals (*Cystophora cristata*), which are ice-dependent during these life stages. Both populations represent the largest aggregations for the respective species in the world. This area is also an important feeding area for Davis Strait polar bears (*Ursus maritimus*) that migrate annually from as far away as Baffin Island. As such it has been identified as an EBSA by the Canadian government.

Description:

The southern Labrador pack ice IMMA is an area of seasonal pack (drifting) ice that provides an important habitat for a number of species throughout the Newfoundland and Labrador Shelves Bioregion. Freeze-up and melting of the ice in this region influences a variety of important environmental and biological processes including the timing and extent of the spring phytoplankton bloom and provides a stable platform for pupping and nursing of ice-breeding seals such as harp and hooded seals. The ice used by seals usually consists of first year ice (30 cm or thicker) that covers 6-9+ tenths of the surface and will not break up during nursing or the post weaning fasting period. They pup near the southern edge of the seasonal ice pack south of Hamilton Inlet to an area north of Fogo Island, Notre Dame Bay, Newfoundland. The ice may extend from close to the Labrador coast outward, possibly as far as the 200m depth contour. In spring, ice drifts towards the south, but Notre Dame Bay acts as a barrier to stop the drift and retain the ice in the area, providing a stable platform for harp and hooded seals to nurse and rest during the post-weaning fast (Stenson & Hammill, 2014).

The large concentration of seals using this area provides the basis for a complex ecosystem that includes a variety of marine scavengers, seabirds (including ivory gulls), and polar bears. As climate change continues to reduce sea ice concentration and thickness, particularly in the Gulf of St. Lawrence, this area will become increasingly important as pupping habitat for these ice-breeding seals.

Figure 1: Whelping harp seals (*Pagophilus groenlandicus*) nursing their pups on the drifting sea ice along the Labrador coast. Photo credit: G. Stenson.

Figure 2: Female hooded seal and pup (*Cystophora cristata*) with an attending male. Photo credit: M. Hammill.

Figure 3: Polar bears travel from the Arctic to this IMMA each spring to fed upon the abundant seals and build up energy. Photo credit: D. McKinnon.

Criterion A: Species or Population Vulnerability

Two of the Qualifying Species within the Southern Labrador Pack Ice IMMA are considered threatened with extinction according to the IUCN Red List. Polar bears (*Ursus maritimus*) and hooded seals (*Cystophora cristata*) are both assessed as Vulnerable (Wig et al., 2015; Kovacs, 2016). The polar bear is listed as Threatened under the USA Endangered Species Act and Special Concern by the Committee on the Status of Endangered Species (COSEWIC) in Canada. In 2011 it was formally listed as Special Concern under the Canadian Species at Risk Act. In Newfoundland and Labrador, polar bears are listed as Vulnerable (COSEWIC, 2018).

Criterion C: Key Life Cycle Activities Sub-criterion C1: Reproductive Areas

Harp (*Pagophilus groenlandicus*) and Hooded seals are endemic to the North Atlantic. With a total abundance of 6.5 million animals (ICES, 2023[1]), harp seals are the most abundant marine mammals in the North Atlantic. At approximately 4.7 million animals, Northwest Atlantic harp seals account for 72% of the global population (ICES, 2023[1]; Tinker et al., 2023). Harp seals only haul out on ice to give birth and to rest. Northwest Atlantic harp seals pup on the pack ice off southern Labrador/northeast Newfoundland (referred to as the Front) and in the Gulf of St. Lawrence (Gulf). This population has been impacted by climate change both directly through increased

pup mortality associated with reduced ice, and indirectly through changes in prey availability resulting in increased late-term abortions (Stenson et al., 2014; Tinker et al., 2023). Since 1990, the proportion of the NW Atlantic population pupping on the pack ice at the Front has increased from ~80% of total pupping to ~96% in 2017 (69% of the world's total now pups off Newfoundland), due to a significant reduction of ice in the Gulf (Stenson et al., 2022). The southern Gulf component of this population is likely to disappear as seals move to the Labrador area to pup.

The estimated total global abundance of hooded seals is 670,300 animals (ICES, 2023, Hammill & Stenson, 2006). The Northwest Atlantic population accounts for 89% of the total, but this population has not been assessed since 2006. The 2006 NE Atlantic hooded seal population estimate was 88,300 animals, much smaller than the abundance estimate for NW Atlantic hooded seals at the time (ICES, 2008; Hammill & Stenson, 2006). Hooded seals also pup on the southern Labrador pack ice in areas close to the harp seal concentrations. Historically there are two other whelping (i.e. pupping) areas, the southern Gulf of St. Lawrence and in the Davis Strait, but a 2005 survey of all three areas found that >91% of the pups were born off southern Labrador (Stenson et al., 2006). Davis Strait pupping had declined since a previous survey and poor ice in the Gulf of St. Lawrence has likely reduced pupping there. As a result, almost the entirety of the NW Atlantic hooded seal population now pups in the southern Labrador pack ice area IMMA.

[1] Assuming an adult to pup ratio of 5:1 to estimate Barents Sea harp seal abundance (ICES 2023).

Sub-criterion C2: Feeding Areas

The global abundance of polar bears (*Ursus maritimus*) is estimated to be 23,300 animals (Hamilton & Derocher, 2018). The Davis Strait (DS) population accounts for approximately 9% of the global total or 2200 animals (Hamilton & Derocher, 2018; Peacock et al., 2013). The southern Labrador pack ice is an important feeding area for polar bears from the DS population. Bears migrate annually from northern Labrador and Baffin Island to the harp and hooded seal whelping concentrations on the southern Labrador pack ice, where they feed intensively during March on the energy-rich harp and hooded seal pups. The energy gained off southern Labrador maintains the bears for much of the year. The proportion of the DS polar bear population migrating south to the harp and hooded seal breeding ice is not known, but increased survival and reproduction of the bears in the southern Davis Strait population has been linked to changes in the abundance breeding harp seals in Labrador (Peacock et al., 2013).

Supporting Information

Burns, J.M., Lestyk, K., Freistroffer, D., and Hammill, M.O. 2015. 'Preparing Muscles for Diving: Age-Related Changes in Muscle Metabolic Profiles in Harp (*Pagophilus groenlandicus*) and Hooded (*Cystophora cristata*) Seals'. Physiol. and Biochem. Zool. 88:167-182.

COSEWIC. 2018. COSEWIC assessment and status report on the Polar Bear *Ursus maritimus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 113 pp.

Department of Fisheries and Oceans (DFO). 2013. Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) within the

Newfoundland and Labrador Shelves Bioregion. DFO Canadian Science Advisory Secretariat Science Advisory Report 2013/048.

Dunham, K.D., Dyck, M.G., Ware, J., Derocher, A.E., Regehr, E.V., Stern, H.L., Stenson, G.B., and Koons, D.N. 2024. 'A demographic survey of the Davis Strait polar bear subpopulation using physical and genetic capture-recapture-recovery sampling'. Marine Mammal Science, 2024;e13107.

Hammill, M.O. and Stenson, G. 2006. Abundance of Northwest Atlantic hooded seals (1960-2005). DFO Canadian Science Advisory Secretariat Research Document 2006/068.

Hamilton, S.G. and Derocher, A.E. 2018. 'Assessment of global polar bear abundance and vulnerability'. Animal Conservation, 22:83-95. Available at: doi:10.1111/acv.12439.

ICES. 2008. Report of the Working Group on ICES/NAFO Working Group on Harp and Hooded Seals (WGHARP), 12-16 June 2006, ICES Headquarters. ICES CM 2006/ACFM:32. 28 pp.

ICES. 2023. Report of the Joint ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WGHARP). ICES Scientific Reports. 5:96. 75 pp. Available at: https://doi.org/10.17895/ices.pub.24306100.

Kovacs, K.M. 2016. *Cystophora cristata. The IUCN Red List of Threatened Species 2016*: e.T6204A45225150. Available at:http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T6204A45225150.en.

Peacock, E., Taylor, M.K., Laake, J., and Stirling, I. 2013. 'Population ecology of polar bears in Davis Strait, Canada and Greenland'. J. Wildl. Manage, 77(3):463-476.

Stenson, G.B. and Hammill, M.O. 2014. 'Can ice breeding seals adapt to habitat loss in a time of climate change?' ICES J. Mar. Sci., 71:1977-1986.

Stenson, G.B., Buren, A.D. and Koen-Alonso, M. 2016. 'The impact of changing climate and abundance on reproduction in an ice-dependent species, the Northwest Atlantic harp seal, *Pagophilus groenlandicus*'. ICES. J. Mar. Sci., 73:250-262.

Stenson, G., Gosselin, J.-F., Lawson, J., Buren, A., Goulet, P. Lang, S., Nilssen, K.T., and Hammill, M. 2022. 'Pup production of Harp Seals in the Northwest Atlantic in 2017 during a time of ecosystem change'. NAMMCO Scientific Publications 12. Available at: https://doi.org/10.7557/3.6214.

Stenson, G.B., Hammill, M.O., Lawson, J., and Gosselin, J.F. 2006. 2005 Pup Production of Hooded Seals, *Cystophora cristata*, in the Northwest Atlantic. DFO Canadian Science Advisory Secretariat Research Document 2006/067.

Stenson, G.B., Haug, T. and Hammill, M.O. 2020. 'Harp seals: monitors of change in differing ecosystems'. Frontiers in Marine Science, 7:569258. Available at: https://doi.org/10.3389/fmars.2020.569258.

Tinker, M.T., Stenson, G.B., Mosnier, A., and Hammill, M.O. 2023. Estimating abundance of Northwest Atlantic harp seal using a Bayesian modelling approach. DFO Canadian Science Advisory Secretariat Research Document 2023/068. iv + 56 p.

Wiig, Ø., Amstrup, S., Atwood, T., Laidre, K., Lunn, N., Obbard, M., Regehr, E., and Thiemann, G. 2015. *Ursus maritimus. The IUCN Red List of Threatened Species 2015*: e.T22823A14871490. Available at: http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T22823A14871490.en.

Acknowledgements

We would like to thank the participants of the 2024 IMMA Regional Expert Workshop for the identification of IMMAs in the North West Atlantic Ocean and wider Caribbean region. Funding for the identification of this IMMA was provided by the Water Revolution Foundation, with additional funding and collaboration from the Sargasso Sea Commission, OceanCare and Animal Welfare Institute. Essential administrative support was given by Tethys Research Institute and Whale and Dolphin Conservation.

Suggested Citation: IUCN-MMPATF (2025) Southern Labrador Pack Ice Whelping Area IMMA Factsheet. IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force, 2025.

PDF made available for download at
https://www.marinemammalhabitat.org/factsheets/southern-labrador-pack-ice-whelping-area-imma/