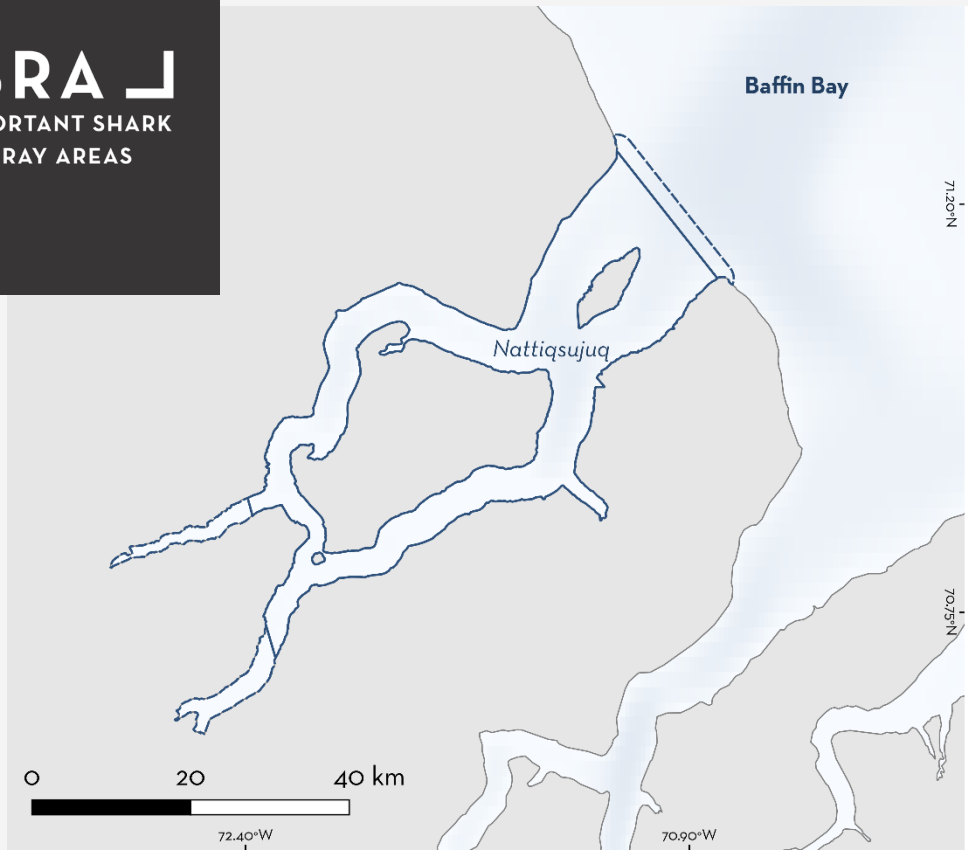
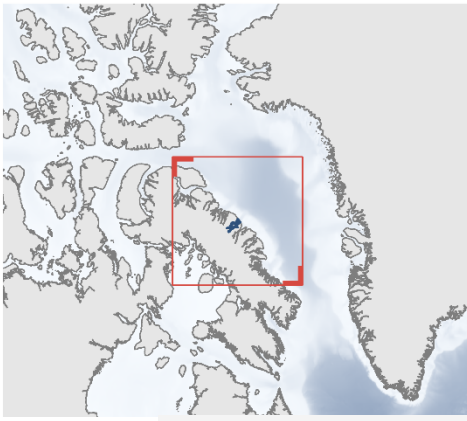
ISRA
IMPORTANT SHARK AND RAY AREAS





Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

NATTIQSUJUQ ISRA

Polar Waters Region

CANADA

0–800 metres

826.2 km²

SUMMARY

Nattiqsujuq, also known as Scott Inlet, is situated on the east coast of Baffin Island, Canada. The area comprises two deep fjords connected to offshore Baffin Bay waters by a prominent deepwater channel. Benthic habitat consists of fine-grained sediments, rocks, and soft corals. The area is influenced by seasonal cycles oscillating between open water during the boreal summer and sea ice coverage during the winter. The area overlaps with the Scott Inlet Key Biodiversity Area. Within the area there are: **threatened species** and **undefined aggregations** (Greenland Shark *Somniosus microcephalus*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Nattiqsujuq, also known as Scott Inlet, is situated on the east coast of Baffin Island in the Qikiqtaaluk region of Nunavut, Canada. The area is connected to offshore Baffin Bay by a prominent channel (800 m depth at its midpoint) on the western side of Baffin Bay (Barkley et al. 2018). Benthic habitat consists of fine-grained sediments and rocks with *Nephtheidae* soft corals (Devine et al. 2019). From December to April, Nattiqsujuq is nearly entirely covered by ice, becoming mostly ice-free by the end of summer (Tang et al. 2004). Greenland Halibut *Reinhardtius hippoglossoides* and Narwhal *Monodon monoceros* occur in the area during the ice-free period (Marcoux et al. 2016; Barkley et al. 2018).

The Baffin Island coast experiences colder, fresher water masses from the High Arctic, with the Baffin Island Current ranging from 0–5°C at the surface and salinities of 30–32. This current flows past the entrance of Nattiqsujuq. The sea ice melts from the fjords are also associated with high productivity as organic carbon content increases in the water column (Pedro et al. 2023).

The area overlaps with the Scott Inlet Key Biodiversity Area (KBA 2024).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 800 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable Greenland Shark (Kulka et al. 2020).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Nattiqsujuq is an important area for undefined aggregations of one shark species.

High catches of Greenland Sharks in Nattiqsujuq during research sampling conducted in September 2011, 2012, and 2013 highlight the high abundance of sharks in this small area. Eight longline sets were completed over three years and caught 52 Greenland Sharks (100–312 cm total length [TL]) (Hussey et al. 2015). Longlines (ranging in length from 368 to 735 m) were set in the same approximate location within Scott Inlet Fjord at depths between 668 and 800 m and soaked for ~10–12 hours. In 2011, eight individuals were caught in one set and in 2012, 17 individuals in two sets. In 2013, another 27 sharks were captured in five days of sampling, highlighting the high number of sharks in this inlet during this season.

Between 2013–2016, 65 Greenland Sharks were tagged with acoustic transmitters in the area (93–350 cm TL) (Edwards et al. 2021). Over the multi-year monitoring period, sharks were present in the area on a defined seasonal basis with the earliest recorded entry on 21st July and the latest departure on 22nd November, and with the overall presence in this inshore system strongly associated with the ice-free season (i.e., boreal summer/fall). Importantly, the receivers remained deployed throughout the winter period, but no sharks were detected, even though Greenland Sharks have been captured by fishers in coastal waters offshore Nattiqsujuq during the ice-covered period (Walsh 2008). The seasonal aggregation of Greenland Sharks in this specific fjord being tied to ice cover is supported by the median date of entry into Nattiqsujuq at one specific gate by 8th August and median date of

exit on 5th October. The majority of tagged sharks exited (n = 89 events) and entered (n = 24) Nattiqsujuq via this closely spaced receiver gate dividing Nattiqsujuq from offshore Baffin Bay. High numbers of individual sharks (relative to those tagged per year) were detected on this gate, including 23 individuals in 2014 (100% of tagged individuals in 2014). In total, 24.6% of the tagged sharks (16 of 65) returned in subsequent years (up to three years post release). These return data and remaining period in the area (up to 99 days) provide evidence of a seasonal aggregations of individuals within this area. The 95% extent of activity space for all Greenland Sharks across all years of study was focused on the inner channel and on the gate at the mouth of Nattiqsujuq.

Between 2012–2018, 193 Greenland Sharks, including those detailed above, were tagged with acoustic transmitters at seven inshore sites along the east coast of Baffin Island (Edwards et al. 2022). Of the 155 detected sharks, 81 were detected at this area.

In September 2016, one baited remote underwater video station (BRUVS) was deployed within the area, at 620 m depth and another one at the exit channel to Baffin Bay at ~800 m. Individuals were identified from the video footage using unique scar and colouration patterns and other physical characteristics. Six sharks were recorded in this area (9.15 hours total recording time) and two sharks offshore the inlet (9.5 hours) (mean size, 198.3 ± 73.8 cm TL) (Devine et al. 2018).

Combined, these studies provide evidence for the seasonal aggregation of Greenland Sharks at Nattiqsujuq during the ice-free period (July–November). It is possible these juvenile/sub-adult animals are aggregating in this system during the ice-free period to feed as potential prey such as Greenland Halibut and Narwhal also move offshore as sea ice forms (McMeans et al. 2015; Marcoux et al. 2016; Barkley et al. 2018). More information is required to determine the nature and function of this aggregation.

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QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
Somniosus microcephalus	Greenland Shark	VU	0–2,992	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
RAYS		
Amblyraja hyperborea	Arctic Skate	LC

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.

REFERENCES

Barkley AN, Hussey NE, Fisk AT, Hedges KJ, Treble MA. 2018. Transient movements of a deep-water flatfish in coastal waters: Implications of inshore–offshore connectivity for fisheries management. *Journal of Applied Ecology* 55: 1071–1081. https://doi.org/10.1111/1365-2664.13079

Devine BM, Wheeland LJ, Fisher JA. 2018. First estimates of Greenland shark (*Somniosus microcephalus*) local abundances in Arctic waters. *Scientific Reports* 8(1): 974. https://doi.org/10.1038/s41598-017-19115-x

Devine BM, Wheeland LJ, de Moura Neves B, Fisher JA. 2019. Baited remote underwater video estimates of benthic fish and invertebrate diversity within the eastern Canadian Arctic. *Polar Biology* 42: 1323–1341. https://doi.org/10.1007/s00300-019-02520-5

Edwards JE, Hedges KJ, Hussey NE. 2021. Seasonal residency, activity space, and use of deep-water channels by Greenland sharks (*Somniosus microcephalus*) in an Arctic fjord system. Canadian *Journal of Fisheries and Aquatic Sciences* 79(2): 314–330. https://doi.org/10.1139/cjfas-2021-0009

Edwards JE, Hedges KJ, Kessel ST, Hussey NE. 2022. Multi-year acoustic tracking reveals transient movements, recurring hotspots and apparent seasonality in the coastal-offshore presence of Greenland sharks (*Somniosus microcephalus*). *Frontiers in Marine Science* 9: 902854. https://doi.org/10.3389/fmars.2022.902854

Hussey NE, Cosandey-Godin A, Walter RP, Hedges KJ, VanGerwen-Toyne M, Barkley AN, Kessel ST, Fisk AT. 2015. Juvenile Greenland sharks *Somniosus microcephalus* (Bloch & Schneider, 1801) in the Canadian Arctic. *Polar Biology* 38: 493–504. https://doi.org/10.1007/s00300-014-1610-y

Key Biodiversity Areas (KBA). 2024. Key Biodiversity Areas factsheet: Scott Inlet. Available at: https://www.keybiodiversityareas.org/site/factsheet/11310 Accessed May 2024.

Kulka DW, Cotton CF, Anderson B, Derrick D, Herman K, Dulvy NK. 2020. *Somniosus microcephalus. The IUCN Red List of Threatened Species* 2020: e.T60213A124452872. https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T60213A124452872.en

Marcoux M, Ferguson SH, Roy N, Bedard JM, Simard Y. 2016. Seasonal marine mammal occurrence detected from passive acoustic monitoring in Scott Inlet, Nunavut, Canada. *Polar Biology* 40: 1127–1138.

McMeans BC, Arts MT, Fisk AT. 2015. Impacts of food web structure and feeding behavior on mercury exposure in Greenland Sharks (*Somniosus microcephalus*). *Science of the Total Environment* 509–510: 216–225. https://doi.org/10.1016/j.scitotenv.2014.01.128

Pedro S, Lemire M, Hoover C, Saint-Béat B, Janjua MY, Herbig J, Geoffroy M, Yunda-Guarin G, Mosian M-A, Boissinot J, et al. 2023. Structure and function of the western Baffin Bay coastal and shelf ecosystem. *Elementa Science of the Anthropocene* 11: 1. https://doi.org/10.1525/elementa.2022.00015

Walsh P. 2008. Winter longline fishing in Scott inlet/Sam Fjord, Baffin Island. Technical Report. Centre for Sustainable Aquatic Resources, Fisheries and Marine Institute of Memorial University of Newfoundland & Clyde River Hunters and Trappers Association.