WWF CANADA

REDUCING IMPACTS FROM SHIPPING IN MARINE PROTECTED AREAS: A TOOLKIT FOR CANADA

REDUCING IMPACTS FROM SHIPPING IN SCOTT ISLANDS MARINE NATIONAL WILDLIFE AREA: PACIFIC CASE STUDY

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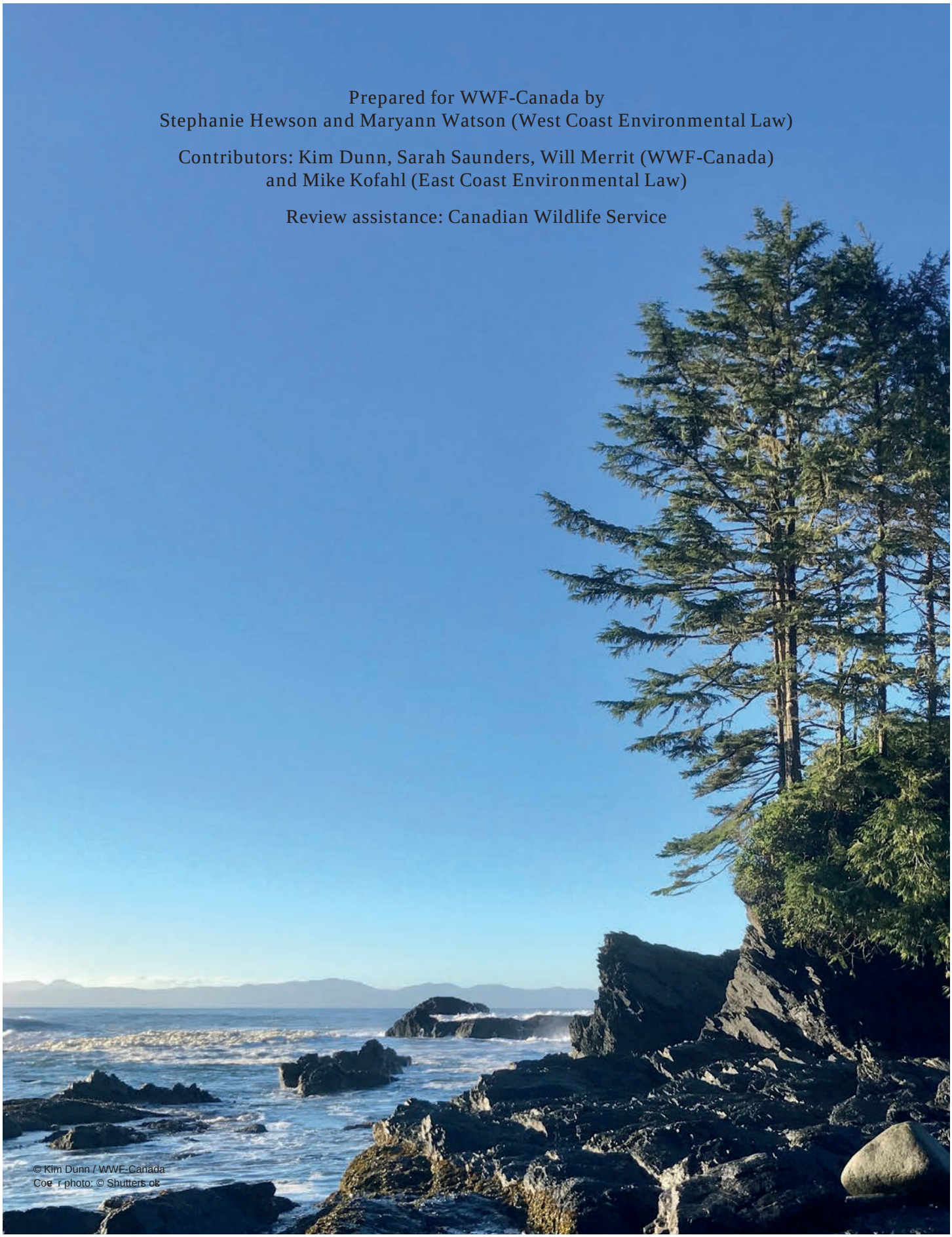

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Contents

EXECUTIVE SUMMARY

The Scott Islands marine National Wildlife Area was established in 2018 to protect the 11,546 square kilometres (km^2) of ocean surrounding the Scott Islands archipelago at the northwestern end of Vancouver Island, British Columbia. Planning for designation of this area has been underway for decades as it supports the largest and most diverse seabird nesting colonies in Pacific Canada. It is the first marine National Wildlife Area (mNWA) designated by Environment and Climate Change Canada (ECCC) under the *Canada Wildlife Act*.

Vessel traffic within the Scott Islands mNWA is frequent and mostly includes traffic from cargo and cruise ships, as well as some oil tanker traffic and towing vessels. Concerns about the potential risks from shipping to ecological components of the mNWA were raised during the development process.

At present, though the Regulations establish some measures to reduce the risk of predator introduction to the islands, they still largely permit shipping and other vessel traffic to continue as before.

Many important species that use the mNWA, including seabird colonies and a number of at-risk species listed under the *Species at Risk Act* (SARA) – several species of migratory birds, sea lions, killer whales, humpback whales and sea otters – have noted vulnerabilities to impacts of oil discharges, spills and disturbance from vessels (both above and underwater). These potential impacts and risks are described in this Case Study.

Recommendations to address these threats are made within the context of the Scott Islands mNWA and its legal framework.

RECOMMENDATIONS

RECOMMENDATION #1:

Introduce measures to regulate vessel routeing. The *Canada Shipping Act*, 2001 (CSA) provides multiple powers to reroute vessels carrying, discharging or at risk of discharging a pollutant in Canadian waters and the Exclusive Economic Zone (EEZ). These can include absolute restrictions, recommended or compulsory routes and no-go zones. In other National Wildlife Areas (NWAs), ships wishing to enter the NWA require a permit. Restrictions on vessel routeing are a useful tool to address all of the impacts of shipping, including oil spills, disturbance and vessel strikes, underwater noise, and vessel discharges.

RECOMMENDATION #2:

Introduce measures to regulate vessel speed. The CSA grants Transport Canada (TC) the authority to regulate navigation within Canadian waters and the EEZ. This authority has been used on the Atlantic and Pacific coasts to reduce risks to threatened whale species, and it could be used to address vessel disturbance, strikes and noise within Scott Islands marine National Wildlife Area (mNWA). Reductions in vessel speed can also play a large role in reducing underwater noise.[1]

RECOMMENDATION #3:

Establish vessel and noise monitoring programs for the mNWA. Vessel and noise monitoring programs have occurred in marine protected areas (MPAs) such as SGaan Kinghlas-Bowie Seamount[2] and the Gully.[3] Similar programs have been established in United States National Marine Sanctuaries.[4] Expanding the use of these indicators and monitoring programs to other Canadian MPAs will increase understanding of human activities and anthropogenic noise and ensure the efficacy of measures taken to address these issues.

1 IMO MEPC.1/Circ 833: Guidelines for the Reduc ion of Underwater Noie from Commerc al Shipping to Addres Adve re Impac s on Marine Life. Information Doc ment 3.2.1. ASCOBANS Adv s ry Committee Meeting, 29 September-1 Oc ober 2014. Sweden. ascobans.org/sites/default/files/document/AC21_Inf_3.2.1_IMO_NoiseGuidelines.pdf

2 DFO. 2011. SGaan Kinghlas Bowie Seamount Marine Protec ed Area Monitoring Indic tors, Protoo ls and Strategies DFO Canadian Sc ene Adv s ry Sec etariat Sc ene Adv s ry Report. 2010/036; NEMES. 2015. Work op on Ves ls and Noie at SGaan Kinghlas Bowie (SK-B) Seamount MPA. neme projec .co m/2015/02/20/work op-on-ve s ls and-noie -at-g aan-k nghlas bowie-k b-s amount-mpa/

3 DFO. 2010. Gully Marine Protec ed Area Monitoring Indic tors, Protoo ls and Strategies DFO Canadian Sc ene Adv s ry Sec etariat Sc ene Adv s ry Report. 2010/066.

4 NOAA. National Marine Sanc uaries Sound Monitoring. Ac s d 12 Dec mber 2020. a nc uaries noaa.gov/s ene /monitoring/s und/

RECOMMENDATION #4:

Introduce prohibitions on vessel discharges. The discharge of potentially harmful substances from vessels should be completely prohibited within the Scott Islands mNWA. This is consistent with the minimum protection standard on dumping within MPAs, which should be comprehensively defined to include all of these common vessel discharges.

Harmful substances include discharges of oily mixtures, greywater, sewage and ballast water, as well as other general vessel discharges. A number of legal options exist under the CSA and its Regulations to prohibit these discharges. For example, the waters of the Scott Islands mNWA have been designated as a no-discharge zone under the *Vessel Pollution and Dangerous Chemicals Regulations* and the *Ballast Water Control and Management Regulations*. A similar no-discharge zone could also be included within the *Scott Islands Protected Marine Area Regulations*. Another option is to require a higher standard of treatment for all effluents discharged within the area.

RECOMMENDATION #5:

P**roactively regulate shipping activities.** The *Scott Islands Protected Marine Area Regulations* include a blanket exception for shipping and navigation within the area, which has been the traditional approach in MPA development in Canada. However, given increasing scientific findings on the impacts of shipping as well as the projected increase in vessel traffic in the future, a more proactive and precautionary risk-based approach is needed. New, more proactive approaches are being pursued in certain MPAs, including vessel traffic restrictions in NWAs in Nunavut, the prohibition on greywater discharge in Banc-des-Américains MPA, and increased monitoring and prohibitions on ballast water exchange surrounding SGaan Kinghlas-Bowie Seamount MPA.

RECOMMENDATION #6:

Improve interdepartmental coordination with Transport Canada (TC). While NWAs are developed and managed by Canadian Wildlife Service (CWS)-ECCC, Fisheries and Oceans Canada (DFO) retains its management authority over fishing, and TC retains its authority over navigation. The development of the Scott Islands mNWA demonstrates extensive coordination between CWS-ECCC and DFO, including in the development of an ecological risk-based analysis on the impacts of commercial fishing. As navigation was identified as one of the other primary threats to marine biodiversity within the mNWA, the same level of engagement and collaboration is needed with TC.

RECOMMENDATION #7:

Increase consideration of shipping impacts on species at risk. One of the objectives of the Scott Islands mNWA is the conservation of species at risk and their habitats. The management plans of several at-risk species rely on Scott Islands mNWA as a protective measure. However, much of the development of the mNWA focused on migratory seabirds, and threats to species at risk do not appear to have been adequately considered or addressed. In particular, the impacts caused by shipping activities to species at risk have not been considered within the mNWA. Fulfilling the goals of the Scott Islands mNWA and the species at risk management plans requires adequately addressing the risks for this population caused by shipping activities within the mNWA.

RECOMMENDATION #8:

Integrate the management of Scott Islands mNWA into wider vessel management. Improved management of shipping in the mNWA should be coordinated with other marine spatial planning initiatives and with activities under the Oceans Protection Plan (OPP). These initiatives present an opportunity to implement management of vessel impacts within a larger marine spatial planning and regulation framework.

THE SCOTT ISLANDS MARINE NATIONAL WILDLIFE AREA

INTRODUCTION

The Pacific Case Study of the Scott Islands marine National Wildlife Area is part of Reducing Impacts from Shipping in MPAs: A Toolkit for Canada (Toolkit), which is a decision-support tool based on policy, regulatory and statutory analysis and supplemented by data analysis and mapping. The Toolkit is aimed at helping decision makers, marine protected area practitioners and the shipping industry make informed decisions to reduce or mitigate shipping impacts in Canadian marine protected areas (MPAs). Within this Case Study and all Toolkit documents, shipping refers to commercial shipping vessels, including commercial passenger vessels. It does not include fishing vessels or recreational vessel traffic.

A key component of the Toolkit is a regulatory and legal analysis of shipping laws in Canada within the context of MPAs, which is found in the *Navigating the Law: Reducing Shipping Impacts in Marine Protected Areas* report. This Case Study is one of the supporting documents to that analysis, and it is complemented by *Reducing Impacts from Shipping in St. Anns Bank MPA: Atlantic Case Study* and *Reducing Impacts from Shipping in Tallurutiup Imanga National Marine Conservation Area: Arctic Case Study*.

Specifically, this Case Study is the culmination of legal, policy and data analysis of shipping impacts in the Scott Islands mNWA to determine how the tools identified in the *Navigating the Law* report might be used within the context of the Pacific Ocean and a marine National Wildlife Area created under the *Canada Wildlife Act*. We note that many of Canada's MPAs are in close proximity to other protected areas, and that while this Case Study examines shipping for the Scott Islands mNWA, management measures on a regional scale should consider a similar analysis for neighbouring MPAs (e.g., Offshore Pacific Area of Interest, Hecate Strait/Queen Charlotte Sound Glass Sponge Reefs MPA).

OVERVIEW OF THE SCOTT ISLANDS AREA

The Scott Islands mNWA protects the 11,546km^2 of ocean areas surrounding the Scott Islands archipelago, off the northwestern tip of Vancouver Island in British Columbia (BC). It is one of the most diverse marine ecosystems on Canada's Pacific coast, supporting the highest concentration of seabirds in the Canadian Pacific, a diversity of marine mammals and fish species and a biologically rich habitat that also supports many species at risk.[5]

The Scott Islands and the surrounding waters are within the territories of the Quatsino and Tlatlasikwala Nations. Several other First Nations have territories or marine interests that overlap with portions of the mNWA. The islands within the archipelago are protected as provincially designated parks and ecological reserves.

The primary conservation objective of the mNWA is to "conserve migratory seabirds, species at risk, and the habitats, ecosystem linkages and marine resources that support these species."[6] This objective is to be achieved by managing human activities which may interfere with this objective and with other wildlife and wildlife habitat.[7]

Management of the Scott Islands mNWA is led by the Canadian Wildlife Service (CWS), a branch of Environment and Climate Change Canada (ECCC), with support from Fisheries and Oceans Canada (DFO) and the Canadian Coast Guard, Transport Canada (TC), National Resources Canada and the Province of British Columbia. Co-management frameworks are being developed with the Quatsino and Tlatlasikwala First Nations.[8]

A multi-stakeholder Advisory Committee also gives support to the management of the mNWA. The Committee is chaired by ECCC and has representatives from BC Parks, local governments, commercial and recreational fishing, commercial shipping, conservation organizations, tourism and other industries.[9]

As of 2020, the management plan is currently in development.[10] The management plan builds on the management framework outlined in the regulatory strategy and the 2016 and 2018 Regulatory Impact Analysis Statements developed during the establishment of the mNWA.

DEVELOPMENT OF THE SCOTT ISLANDS mNWA

The Scott Islands mNWA was formally designated as a protected area in 2018; however, the area had been the focus of marine conservation efforts for many years. The marine waters surrounding Scott Islands were first identified as a potential area for protection by conservation organizations and ECCC in 1995.[11]

The Province of BC had previously protected the islands themselves through provincial designations, establishing Anne Vallée (Triangle Island), Beresford Island, and Sartine Island Ecological Reserves in 1971, and the Lanz and Cox Islands Provincial Park in 1995. The province noted the vulnerability of these terrestrial protected areas to activities related to commercial shipping, including "oil spills, disturbance from boats and planes, feral rabbits, invasive species... possible shipwrecks and the subsequent introduction of rats."[12]

5 Environment and Climate Change Canada. 2018. Scott Islands marine National Wildlife Area. Environment and Climate Change Canada. Online: canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/scott-islands marine.html#toc0

6 Government of Canada. 2018. Establishing the Scott Islands marine National Wildlife Area. Online: canada.ca/en/environment-climate-change/news/2018/09/establishing-the-scott-islands marine-national-wildlife-area.html

7 Scott Islands Protected Marine Area Regulations, SOR/2018-119, Regulatory Impact Analysis Statement, (2018) Canada Gazette II, 2197 [2018 RIAS].

8 Government of Canada. Establishing the Scott Islands marine National Wildlife Area. Online: canada.ca/en/environment-climate-change/news/2018/09/establishing-the-scott-islands marine-national-wildlife-area.html

9 Environment and Climate Change Canada. 2018. National Advisory Panel on Marine Protected Area Standards Scott Islands marine National Wildlife Area. Presentation April 7, 2018, Vancouver, BC. Online: dfo-mpo.gc.ca/oceans/documents/consultation/advisory-panel-committee/submissions/SImNWA-deck for-NAP-Final-06Apr2018.pdf

10 Erika Lok Canada Wildlife Service. 2020. Personal Communication.

11 Government of Canada. Establishing the Scott Islands marine National Wildlife Area. Online: canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/scott-islands marine-national-wildlife-area.html

12 BC Parks "Anne Vallé (Triangle Island) Ecological Reserve: Purpose Statement" (February 2003); BC Parks "Beresford Island Ecological Reserve: Purpose Statement"

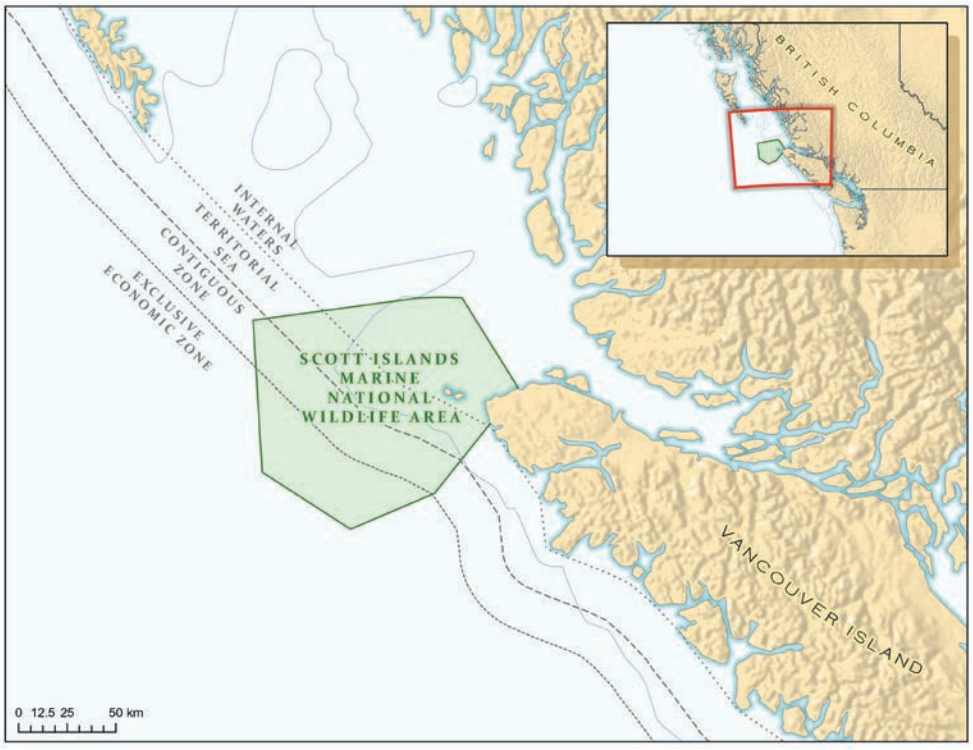
In 2003, the Government of Canada officially announced that ECCC would protect the waters around the Scott Islands. In 2006, DFO recognized the waters surrounding the Scott Islands as an "Ecologically and Biologically Significant Area," a science-based designation that identifies areas worthy of enhanced management or risk aversion.[13] In 2010, CWS established a steering committee and an advisory group, and a regulatory strategy was released for public comment in March 2013.

The Proposed Regulations and Notice of Intent to designate the Scott Islands mNWA were published in *Canada Gazette Part I* (CGI) on December 31, 2016. During the process of developing and designating Scott Islands mNWA, conservation groups voiced concerns that the Regulations did not adequately protect marine biodiversity, seabird populations and other species at risk because they allowed commercial fishing and shipping activities to continue within the protected area.

The mNWA was officially designated on June 27, 2018, by the *Scott Islands Protected Marine Area Regulations* under the *Canada Wildlife Act* (See Figure 1).[14] The Regulations as currently enacted address some impacts of shipping related to predator introduction and invasive species. All other shipping activities continue to be regulated under the *Canada Shipping Act, 2001* (CSA).[15] At the time of designation, Shell Canada announced its intent to relinquish 50,000km^2 of exploratory drilling rights off the coast of Northern Vancouver Island, including 3,205km^2 within the Scott Islands mNWA; however, the status of that relinquishment is not publicly available.[16]

Figure 1. Scott Islands marine National Wildlife Area

Map displaying the location of Scott Islands marine National Wildlife Area relative to Canada's maritime zones.



(February 2003); BC Parks "Sartine Islands Ecological Reserve: Purpose Statement" (February 2003).

13 DFO. 2004. Identification of Ecologically and Biologically Significant Areas. DFO Canadian Science Advisory Secretariat Ecosystem Status Report. 2004/006.

14 Scott Islands Protected Marine Area Regulations SOR/2018-119.

15 Canada Shipping Act, 2001, SC 2001, c 26 [CSA].

16 The Canadian Press Shell Canada Gives up B.C. Exploration Permits to Make Way for Protected Area. September 13, 2018. Online: bca/news/canada/british-columbia/shell-canada-gives-up-exploration-permits-to-make-way-for-protected-area-1.4823180

ECOLOGICAL CHARACTERISTICS

The Scott Islands area is the most important breeding ground for seabirds in British Columbia, including supporting 55 per cent and 73 per cent of the global and national breeding populations of Cassin's auklet, respectively. The Triangle Island nesting population of rhinoceros auklets accounts for about 7 per cent and 12 per cent of the global and national populations, respectively. Nationally significant populations of many other seabirds are also found here. Seabird research has been ongoing in this area since the 1970s and continues to significantly contribute to scientific knowledge about seabirds and interactions with their environment on the Pacific Coast.[17]

In addition to the great abundance of bird life, the marine area provides several important habitat functions for fish species, including being a spawning and rearing area for Pacific cod, lingcod, sablefish and flatfishes, and important feeding areas for Pacific hake and herring.[18] Also, many species of marine mammals, including seals and cetaceans, use the productive waters surrounding the Scott Islands throughout the year.

Species at risk in Scott Islands mNWA

There are 25 species which use the mNWA that are designated as at-risk under Canada's *Species at Risk Act* (SARA) including eight species of migratory birds, eight marine mammals, two reptiles and seven fishes.[19]

Steller sea lions (listed under SARA as Special Concern) utilize areas of shoreline for resting (haul-outs) or breeding (rookeries) (See Figure 2). BC currently supports approximately 33 per cent of the total Eastern population of Steller sea lions. The rookeries within the Scott Islands are the second largest breeding aggregation of Steller sea lions in the world and support over 70 per cent of pup production for BC's population.[20]

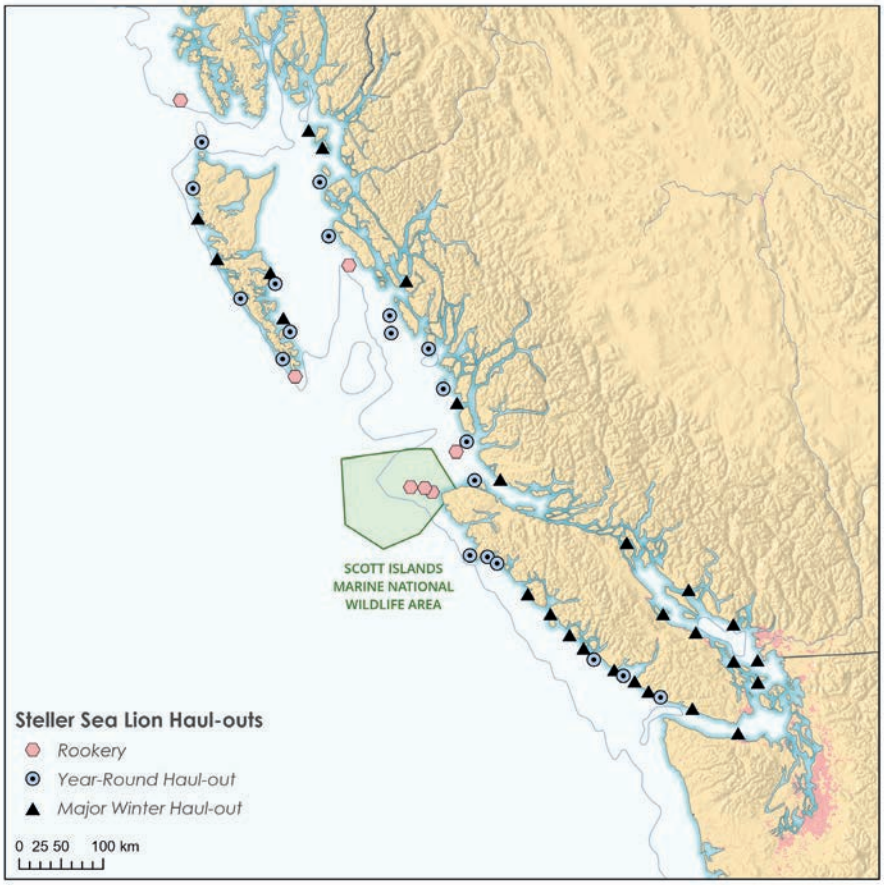
17 Environment Canada. 2013. Regulatory Strategy for the Designation of the Proposed Scott Islands marine National Wildlife Area. Online: canada.ca/en/environment-climate-change/services/national-wildlife-areas-locations-scott-islands marine/regulatory-strategy.html

18 Jamieson, G.S. and Levesque, C. 2014. Identification of Ecologically and Biologically Significant Areas on the West Coast of Vancouver Island and the Strait of Georgia, and in Some Nearshore Areas on the North Coast: Phase II – Designation of EBSAs DFO Canadian Science Advisory Secretariat Research Document. 2014/101. viii + 36 p.

19 Environment and Climate Change Canada. Scott Islands marine National Wildlife Area Management Plan [Proposed].

20 Fisheries and Oceans Canada. 2010. Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada [Final]. Species at Risk Act Management Plan Series Fisheries and Oceans Canada, Ottawa. iv + 69 pp.

Figure 2. Steller sea lion rookeries and haul-out sites



Locations of Steller sea lion rookeries (filled hexagons), year-round haul-out sites (unfilled circles), and major haul-out sites (triangles) in BC, relative to the Scott Islands mNWA. Adapted from the *Species at Risk Act* Management Plan for the Steller Sea Lion.[21]

Sea otters (listed under SARA as Special Concern[22]) are recovering from a greatly reduced population and range. While their numbers are rebuilding and their range is expanding along the coast, the population is not yet clearly secure. The Scott Islands marine area supports one of only two areas within the Pacific North Coast Integrated Management Area (PNCIMA) where sea otters have established a resident population. DFO's management plan for the sea otter notes that "their susceptibility to oil and the proximity to major oil tanker routes make them particularly vulnerable to oil spills."[23]

Additionally, several species of at-risk cetaceans are known to use the waters within the mNWA. These include the blue whale (listed under SARA as Endangered), the northern resident and Bigg's/transient ecotypes of killer whales (both listed under SARA as Threatened), the fin whale (Threatened), grey whale (no status, under consideration) and humpback whales (listed as Special Concern).[24] Of these, the fin whale has important habitat identified within the boundaries of the Scott Islands mNWA (see Figure 3).

21 Fisheries and Oceans Canada. 2010. Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada [Final]. Species at Risk Act Management Plan Series Fisheries and Oceans Canada, Ottawa. iv + 69 pp.

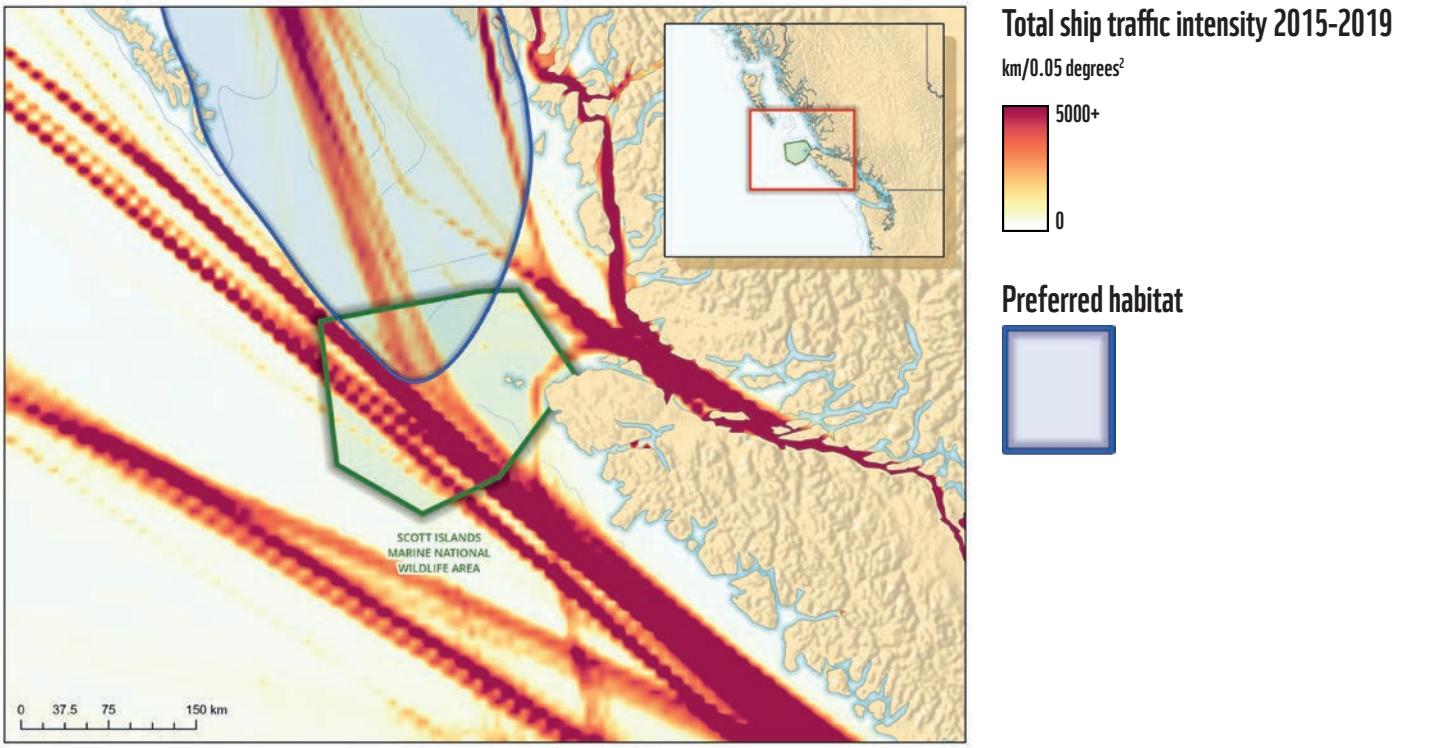
22 Fisheries and Oceans Canada. 2014. Management Plan for the Sea Otter (Enhydra lutris) in Canada. Species at Risk Act Management Plan Series Fisheries and Oceans Canada, Ottawa. iv + 50 pp.

23 Ibid.

24 Jamieson, G.S. and Levesque, C. 2014. Identification of Ecologically and Biologically Significant Areas on the West Coast of Vancouver Island and the Strait of Georgia, and in Some Nearshore Areas on the North Coast: Phase II – Designation of EBSAs DFO Canadian Science Advisory Secretariat Research Document. 2014/101. iv i + 36 pp.

Figure 3. Identified important habitat for the Pacific fin whale

Map displaying the location of the designated important habitat for the Pacific fin whale (blue shaded area) relative to the Scott Islands mNWA (green polygon).[25]



A number of at-risk marine birds are also known to use the waters surrounding the Scott Islands. These include the marbled murrelet (Threatened), the short-tailed albatross (Threatened), the pink-footed shearwater (Threatened), the black-footed albatross (Special Concern)[26] and the ancient murrelet (Special Concern).

As mentioned previously, two of the Scott Islands, Lanz and Cox, have been protected as a provincial park. The Purpose Statement for this protected area also lists the following federally or provincially designated species at risk:[27]

- Northern abalone (listed as Endangered under SARA);
- Marine algae (*Percursaria dawsonii*) (blue-listed under BC's provincial conservation status rank);[28]
- Great blue heron, Peale's peregrine falcon (blue-listed under BC's provincial conservation status rank);
- Leach's storm petrel, fork-tailed storm petrel, pelagic cormorant, bald eagle, and black oystercatcher (yellow-listed under BC's provincial conservation status rank).

25 DFO. (2017). Identification of Habitat of Special Importance to Fin Whales (Balaenoptera physalus) in Canadian Pacific Waters. DFO Canadian Science Advisory Sec etariat Sc ene Adv s ry Report. 2017/039.

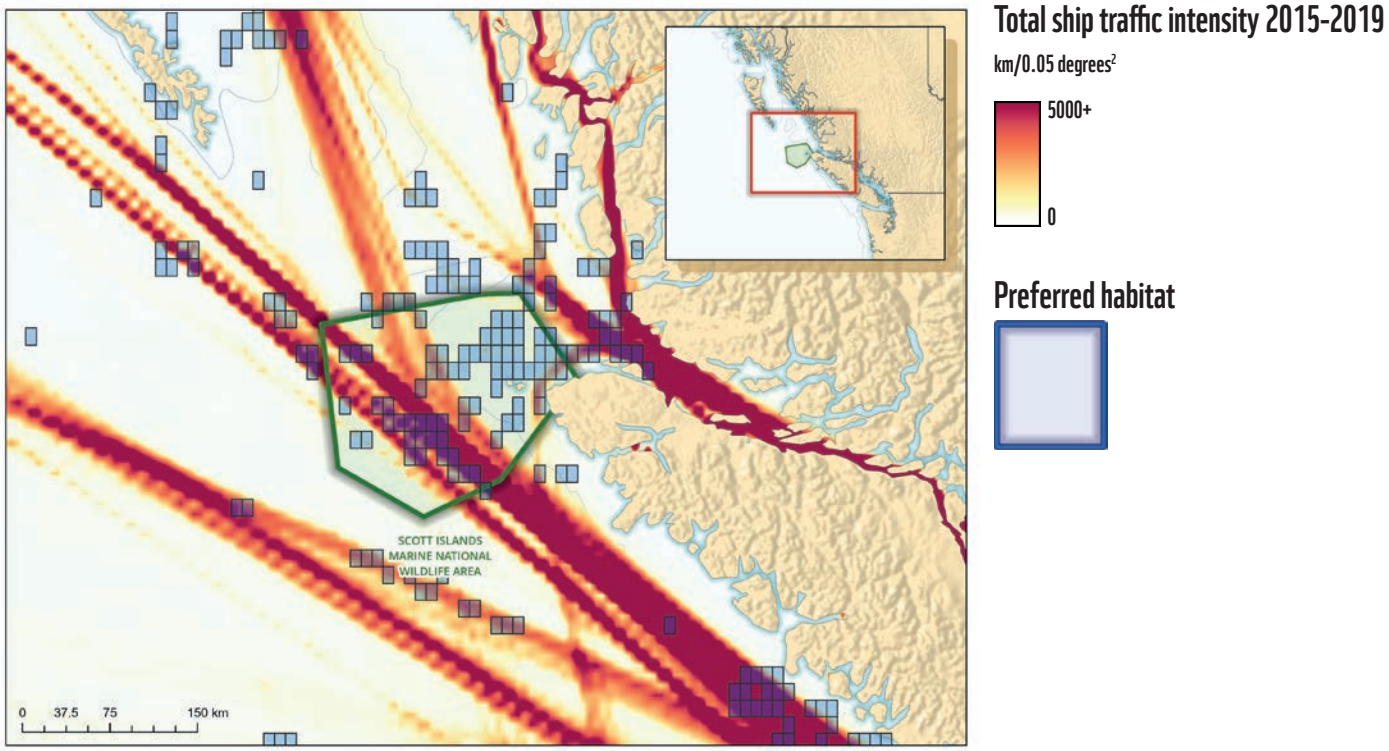
26 Env ronment and Climate Change Canada. 2017. Management Plan for the Black Footed Albatros (Phoebas ria nigripes) in Canada. Spec es at Ris Act Management Plan Series Env ronment and Climate Change Canada. Ottawa. iv 30 pp.

27 BC Parks. 2003. Lanz and Cox Islands Provincial Park Purpose Statement and Zoning Plan. 6 pp. Online: bcparks.ca/planning/mgmtplns/lanzcox/lanz_ps pdf?v=1472509570230

28 Prov ne of Britis Columbia. Red, Blue & Yellow Lis s Online: gov.bc a /gov o ntent/env ronment/plants animals eo sy ems s o ne ra tion-data-e ntre/ep lore-d c data/red-blue-y llow-lis s Red refers to p ec es that are ex irpated, endangered or threatened; blue refers to p ec es of p ec al o ne rn; and y llow refers to p ec es that are uno mmon, o mmon, dec ining or inc eas ng.

Figure 4. Preferred habitat of pelagic seabirds

Map displaying the preferred habitat of pelagic seabirds relative to the Scott Islands mNWA and cumulative 2015 to 2019 ship traffic intensity. Preferred habitat is represented as grid cells in the 90th percentile of bird sightings for all bird species contained in the west-coast pelagic seabird atlas.[29] See ***Appendix A*** for maps of select species.



29 Canadian Wildlife Service. 2016. Atlas of Pelagic Seabirds off the West Coast of Canada and Adjacent Areas [Shapefile]. Environment Canada.

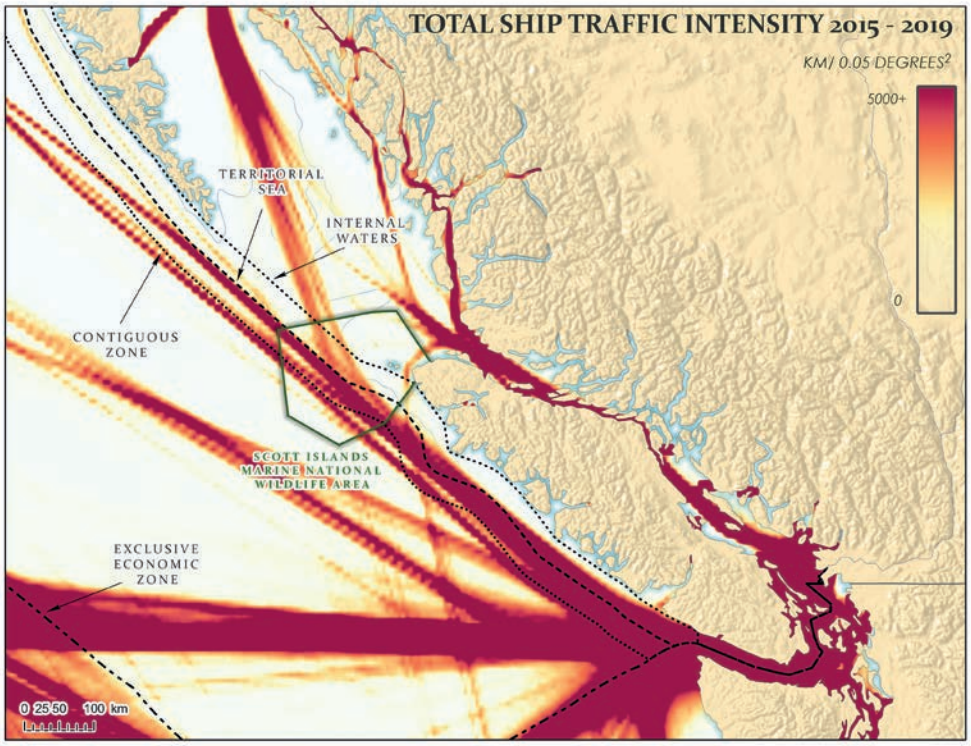
VESSEL TRAFFIC WITHIN THE SCOTT ISLANDS mNWA

Scott Islands is located in a marine region with regular commercial vessel traffic. These are primarily cargo and passenger vessels such as cruise ships transiting through the Scott Islands between Beresford and Lanz and Cox Islands, as well as towing vessels and log booms.

Oil tankers may transit through the area, though they generally use waters farther offshore in accordance with the Voluntary Tanker Exclusion Zone.[30] The islands also provide temporary anchorage in poor weather.[31] In addition to deep sea vessels and cruise ships, some of the vessel traffic is related to economic activities on northern Vancouver Island, such as the forestry industry, as well as guided recreational activities.[32]

Figure 5. Cumulative 2015-2019 ship traffic intensity for the South Coast of BC

Map displaying cumulative ship traffic intensity for the South Coast of BC from 2015 to 2019, represented by total distance travelled in kilometres per 0.5 degrees^2. Distance was derived from Automatic Identification System (AIS) point locations across all available ship types. See ***Appendix B*** for a breakdown of intensity by individual ship types.



30 Environment and Climate Change Canada. Scott Islands marine National Wildlife Area Management Plan [Proposed].
31 Drever, M. 2002. Important Bird Area Conservation Plan for the Scott Islands Prepared for the Canadian Nature Federation.
32 2018 RIAS, supra note 7, 2219-20.

There are several key areas where shipping activities are particularly of concern to marine biodiversity. These include:

- **The shelf break,** an area where cold, nutrient-rich water rises up from the seafloor, supporting food webs that attract whales and seabirds.[33] The shelf break is an area of intense shipping traffic, especially for large bulk carriers, cargo ships, tankers and passenger vessels, which pose a number of threats including noise, physical disturbance, risk of spills and potential for collisions.
- **The Scott Islands.** Vessels transiting through or between the islands may cause visual disturbance and noise pollution, and potentially impact seabirds that are offshore. Vessels transiting the area may also impact the feeding ranges of sea otters and Steller sea lions.[34]
- **The Scott Channel,** which runs between the southernmost Scott Islands and the north coast of Vancouver Island. It is an important area for seabirds, sea otters and Steller sea lions, and also receives a high volume of vessel traffic in the form of bulk carriers, container ships and passenger vessels, much of which services communities in northwest Vancouver Island.[35]
- **Northeast corner of the Scott Islands marine NWA,** which is an area of moderate to high densities of seabird populations and also an area of moderate to high density of vessel traffic, including large passenger vessels, smaller container ships, bulk carriers and some tanker traffic.
- **Deepwater offshore foraging areas,** where large concentrations of sea birds congregate to forage.

33 Bertram, D., Mackas, D., Welch, D., Boyd, W., Ryder, J., Galbraith, M., Hedd, A., Morgan, K. and P. O'Hara. 2017. Variation in Zooplankton Prey Distribution Determines Marine Foraging Distributions of Breeding Cassin's Auklet. Deep Sea Research Part 1: Oceanographic Research Papers (129): 32-40; Gregr, et al. Recovery Strategy for Blue, Fin, and Sei Whales [illegible] i + 53 pp; Environment and Climate Change Canada. 2017. Management Plan for the Black Footed Albatross (Phoebastria nigripes) in Canada. Species at Risk Act Management Plan Series Environment and Climate Change Canada. Ottawa. iv + 30 pp.

34 Fisheries and Oceans Canada. Management Plan for the Sea Otter. iv + 50 pp.; Fisheries and Oceans Canada. Management Plan for the Steller Sea Lion. iv + 69 pp.

35 Robinson Consulting and Associates Ltd. 2011. Net Economic Cost Analysis of Designation for Scott Islands marine National Wildlife Area.15 pp.

LEGAL FRAMEWORK FOR SHIPPING IN SCOTT ISLANDS mNWA

LEGAL FRAMEWORK

The Scott Islands mNWA was established in 2018 by the *Scott Islands Protected Marine Area Regulations* under the *Canada Wildlife Act*. It spans three maritime zones: Canada's territorial sea, contiguous zone and exclusive economic zone (EEZ) (See Figure 1).

Section 2 of the *Scott Islands Protected Marine Area Regulations* prohibit certain activities related to commercial shipping, including:

- Introducing any living organism that is likely to harm wildlife or degrade the quality of wildlife habitat in the mNWA;[36]
- Being within 300 metres (m) of the low water mark of the Triangle, Sartine or Beresford Islands;[37]
- Anchoring a vessel of more than 400 gross tonnes within one nautical mile (NM), or 1.8km, of the low water mark of the Triangle, Sartine or Beresford Islands.[38]

These prohibitions apply to all vessels, including foreign vessels, within the portions of the mNWA that lie within Canada's internal waters and territorial sea.

These prohibitions only apply to foreign vessels within the EEZ of the Scott Islands mNWA to the extent that they are consistent with Article 56 of the *United Nations Convention on the Law of the Sea*.[39] In practice, this is only relevant for the prohibition on introducing living organisms into the mNWA, as the other two prohibitions are spatially defined. Article 56 grants coastal states the jurisdiction to protect and preserve the marine environment within their EEZ as long as they exercise this jurisdiction with due regard to the rights and duties of other states, including the freedom of navigation. The implications of this provision are discussed in greater detail in the "International legal framework" section of *Navigating the Law*.[40]

Section 2 of the *Scott Islands Protected Marine Area Regulations* also prohibits:

- Carrying out any activity that is likely to disturb, damage or destroy wildlife or its habitat in the mNWA or to remove wildlife or its habitat from the mNWA;[41]
- Dumping or discharging any waste material or substance that is likely to harm wildlife or degrade the quality of wildlife habitat in the mNWA.[42]

36 *Scott Islands Protected Marine Area Regulations*, *supra* note 14, s 2(1)(c).
37 Ibid., s 2(1)(e).
38 Ibid., s 2(1)(f).
39 Ibid., s 4.
40 See specifically "Regulating shipping in the EEZ" under the "United Nations Convention on the Law of the Sea" subsection.
41 *Scott Islands Protected Marine Area Regulations*, *supra* note 14, s 2(1)(a).
42 Ibid., s 2(1)(b).

However, Section 5 exempts vessels navigating in accordance with the CSA from these two prohibitions.[43] This means that vessels operating in accordance with the CSA and its Regulations may navigate through the area, even if this activity is likely to disturb, damage or destroy wildlife or habitat within the mNWA. It also means that vessels may continue to discharge waste and effluent as usual, as long as the vessels observe the requirements of the CSA and its Regulations. For the definition of navigation, see the introduction of *Navigating the Law*. For more on the legal framework governing navigation in the CSA, see "The Canadian legal framework" in *Navigating the Law*.

Legal framework for other NWAs

Although Scott Islands is commonly referred to as a "marine National Wildlife Area," or mNWA, the legal name for this designation is in fact a "Protected Marine Area" under section 4.1 of the *Canada Wildlife Act*. Scott Islands is the first Protected Marine Area to be established under the *Canada Wildlife Act*.

There are several important distinctions between Protected Marine Areas and National Wildlife Areas (NWAs), which are designated under section 9 of the *Canada Wildlife Act* and the *Wildlife Area Regulations*.[44] NWAs are generally used to protect terrestrial areas or terrestrial areas and adjacent marine areas. However, NWAs may only extend to the limit of the territorial sea (the limit for NWAs established on public lands under the *Canada Wildlife Act*).[45] In contrast, Protected Marine Areas may only be designated in marine areas, and they may extend to the 200NM limit of the territorial sea. This makes the Protected Marine Areas better suited to protecting large marine areas like Scott Islands.

The second distinction is that NWAs are governed by a much stricter and more protective legal framework than Protected Marine Areas. Within NWAs, including NWAs with marine components, it is prohibited to operate a conveyance, which includes vessels, without a permit.[46] It is also prohibited to carry out any commercial or industrial activity within the NWA without a permit from CWS and its management partners.[47] Similarly restrictive measures were not included within the *Scott Islands Protected Marine Area Regulations*.

Introducing additional shipping measures into the mNWA regulations

The "Shipping impacts for Scott Islands mNWA" section of this Case Study analyzes the most harmful impacts from shipping activities and proposes regulatory solutions to mitigate the risks of these impacts. These solutions include complementary measures under existing shipping-related legislation, as well as measures that could be included directly within the *Scott Islands Protected Marine Area Regulations*.

Although the Regulations currently contain very few measures to reduce the impacts of shipping, there is no legal reason preventing additional measures from being introduced. The *Canada Wildlife Act* empowers the Minister of the Environment to prescribe measures for the conservation of wildlife within Protected Marine Areas/mNWAs.[48] This is broader authority than is provided under other federal MPA legislation. For example, the *Canada National Marine Conservation Areas Act* requires that any regulations that prohibit marine navigation be made on the joint recommendation of the Minister of Environment and Minister of Transport.[49] In practice, it is unlikely that the Minister of Environment would recommend any regulations affecting marine navigation without first consulting TC; however, this does indicate the broad capabilities to address shipping impacts through MPA legislation itself.

43 Ibid., s 2(1)(a),(b), 5(b).
44 Canada Wildlife Act, RSC 1985, c W-9, s 9; Wildlife Area Regulations, CRC c 1609.
45 Scott Islands proposed Management Plan at p iii; Canada Wildlife Act, supra note 45, s 2(1) "public lands." For more detail, see discussion on the Canada Wildlife Act in the "Canadian legal framework" section of Navigating the Law.
46 Wildlife Area Regulations, supra note 45, s 3(1)(h).
47 Ibid, s 3(1)(k). For example, within the Nunavut Settlement Area, any requests for access to NWAs, including requests from cruise ships and other ships, must be reviewed by the appropriate Area Co-Management Committee before a permit is issued. This is in accordance with the Inuit Impact and Benefit Agreement for National Wildlife Areas and Migratory Bird Sanctuaries in the Nunavut Settlement Area (2007-2014 & 2016-2023). See Regulations Amending the Wildlife Area Regulations and Other Department of the Environment Regulations (2019), Canada Gazette I, 2170; Canadian Coast Guard, Notices to Mariners 1 to 46: Annual Edition 2020, (Ottawa: Her Majesty the Queen in Right of Canada, 2020) at 93.
48 Canada Wildlife Act, supra note 45, s 12(i)(iii).
49 Canada National Marine Conservation Areas Act, SC 2002, c 18, s 16(3).

MANAGEMENT GOALS AND OBJECTIVES

The regulatory strategy outlines a management framework for the NWA as well as conservation objectives that will support and inform the development of the management plan.

Box 1. Management goals for the Scott Islands mNWA related to shipping from the Scott Islands Regulatory Strategy.

Goal 1: The natural habitats, ecosystem linkages and marine resources that support seabird populations nesting on the Scott Islands are protected and conserved.

A. Marine habitats and ecosystem functions important for seabird foraging are protected from harmful disturbance, damage or destruction.

B. Forage species utilized by seabirds are available, within the limits of natural variation, to support viable populations of seabirds nesting on the Scott Islands.

Goal 2: The risk of adverse effects on the breeding productivity and survival of seabirds resulting from human activities is mitigated in keeping with the conservation and protection objectives.

A. New and existing activities are reviewed based on demonstrated consistency with the management plan, application of effective mitigation measures and best available information.

B. Proactive measures are in place to ensure effective response to catastrophic and chronic spills of oil or any other hazardous materials.

C. Direct mortality of seabirds caused by human activities is minimized through the use of effective mitigation measures.

Goal 3: The mNWA is managed in a manner that recognizes the authorities for management of human activities in the marine environment and takes into account the socio-economic and cultural values sustained by the marine ecosystem.

A. Breeding habitats on the Scott Islands are maintained, and where feasible restored, in collaboration with the Province of BC, Tlatlasikawala First Nation and Quatsino First Nation.

B. Surveillance, monitoring and enforcement are implemented in collaboration with other agencies, First Nations and marine users.

C. The social and cultural values of First Nations for the Scott Islands and surrounding marine area are respected.

D. In collaboration with other responsible authorities, support the implementation of recovery strategies, action plans and management plans for species listed under Schedule 1 of SARA.

E. Management of the mNWA contributes to the broader marine ecosystem-based management goals for the PNCIMA and the Canada-British Columbia Marine Protected Area Network Strategy.

SHIPPING IMPACTS FOR SCOTT ISLANDS mNWA

OIL DISCHARGES AND SPILLS

Oily discharges and spills are two of the biggest risks posed by commercial shipping within the Scott Islands mNWA. These can occur in the form of authorized discharges of oily mixtures, illegal or unauthorized discharges and small-scale oil spills, and large-scale oil spills. Analysis of oil discharges within the EEZ on the Pacific coast by aerial surveillance detected 101 discharges between 2008 and 2010 and identified northwest Vancouver Island as an area important to marine birds that is potentially at higher risk of exposure to oiling.[50] In another study, a total of 471 oiling incidents were detected along BC's coast between 1997 and 2010 (about 33 per year), and three of these incidents were in the vicinity of the mNWA.[51]

It is estimated that small-scale oil discharges (less than 1,000 litres) likely have a greater ecological impact per volume spilled than large spills because of their higher frequency and larger geographic impact. These discharges, often referred to as "chronic" oil pollution, are mainly associated with bilge water, discharges from routine operations, illegal cleaning of tanks, and propeller shaft bearings.[52] A study investigating potential interactions between marine birds and oil from small-scale discharges identified the waters adjacent to the Scott Islands as being one of two areas at the highest potential risk from oil exposure on the BC coast due to the convergence of high bird density and high probability of small-scale oil discharges.[53]

50 Oiling occurs when oil physically harms an animal, such as by coating a seabird's wings or a marine mammal's fur. Bertazzon, S., O'Hara, P.D., Barrett, O. and N. Serra-Sogas. 2014. Geospatial Analysis of Oil Discharges Observed by the National Aerial Surveillance Program in the Canadian Pacific Ocean. Applied Geography Volume 52, Augus 2014, pp 78-89. Ae s d on Oc ober 19, 2017

51 Env ronment Canada. 2013. Regulatory Strategy for the De gnation of the Propo d So tt Is ands Marine National Wildlife Area.

52 Gertler, C., Yakimov, M.M., Malpass, M.C. and P.N. Golyshin. 2010. Shipping-Related Accidental and Deliberate Release into the Environment BT – Handbook of Hydrocarbon and Lipid Microbiology, in: Timmis, K.N. (Ed.). Springer Berlin Heidelberg, Berlin, Heidelberg, pp 243-256. doi.org/10.1007/978-3-540-77587-4_16

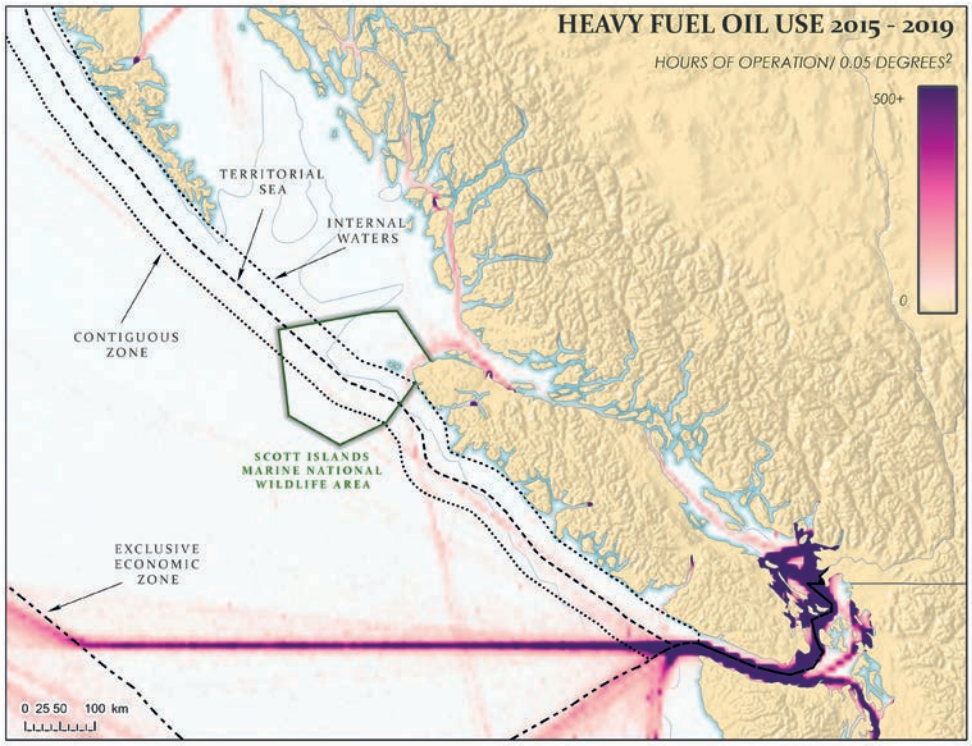
53 Fox, C.H., O'Hara, P.D., Bertazzon, S., Morgan, K., Underwood, F.E. and P.C. Paquet. 2016. A preliminary spatial assessment of risk: Marine birds and Chronic Oil Pollution on Canada's Pacific Coast. Science of the Total Environment; 573, pp 799-809. doi.org/10.1016/j.scitotenv.2016.08.145

Small-scale oil discharges are very unlikely to trigger formal clean-up or mitigation efforts because of their small size and high frequency of occurrence within large and remote areas. As a result, their oil often persists in ocean sediment and the marine environment for years.[54] This chronic impact is a significant risk and source of mortality for seabirds as oil reduces the waterproofing and insulating properties of their feathers, leading to death from hypothermia. Oil in the marine environment is also a significant threat to many other levels of marine life, from zooplankton to marine mammals.[55]

Though less common, large-scale, "catastrophic" oil spills from ships are also a threat. In 1999, two freighters, the *M.V. Elizabeth* and *M.V. Caria*, lost power offshore of the Scott Islands and drifted. Together, these vessels contained a total of almost 3,000 metric tonnes of intermediate fuel and distillate and 100 tonnes of hazardous materials. Fortunately, the *M.V. Elizabeth* was able to regain power, and a rescue tug reached the *M.V. Caria* and towed it to shelter.[56] This incident and others are a reminder of the vulnerability of the area and the significant damage that could be caused by a spill within the mNWA. Most of the vessels using heavy fuel oil are not operating within the boundaries of the mNWA (See Figure 6).

Figure 6. Cumulative 2015-2019 ship heavy fuel use for the South Coast of BC

Map displaying the cumulative ship heavy fuel use from 2015 to 2019 along the South Coast of British Columbia as represented by total hours of operation per 0.5 degrees.[2] Time spent by residual-fuel-oil-using ships was derived from AIS point locations across all available ship types. See ***Appendix C*** for a breakdown by individual ship types.



54 D.S. Etkin "Worldwide Analysis of In-Port Vessel Operational Lubricant Discharges and Leakages" (2009) Environmental Research Consulting, 1529-1553; R Pitt "Case study example for oil spill movement and fate" (2002) online: rpitt.eng.ua.edu/Class/Effect and Fates Module7/Module7.htm

55 Ibid.

56 IBA Canada. 2002. Important Bird Area Conservation Plan for the Scott Islands By Mark Drever for the Canadian Nature Federation. Online at ibacanada.com/documents/conservationplans/scottislands pdf at 20.

Another significant issue is a lack of capacity for monitoring and enforcement. The Scott Islands mNWA Regulatory Strategy notes that surveillance for the area is low, and that less than 1 per cent of oiling occurrences will be detected. Where surveillance does exist, it may not necessarily deter ships from discharging oily substances. A comparison of aerial surveillance detections of small-scale oil spills to distributions of beached bird survey data on the BC coast indicates that, in some regions of the coast, the presence of aerial surveys does not necessarily function as a deterrent for ships activities which result in oil discharges.[57] For more information about monitoring, see the Toolkit report *Reducing Impacts from Shipping in MPAs: Evaluating Tools for Monitoring and Compliance.*

Legal options

The *Scott Islands Protected Marine Area Regulations* allow for navigation and vessel transit that is carried out in accordance with the CSA and its Regulations, and therefore the CSA provides the relevant legal framework for oil discharges and spills (discussed in greater detail in subsection "Select laws affecting commercial shipping" in the "Canadian legal framework" section of *Navigating the Law*). Under the CSA, oil and oily mixtures are a prescribed pollutant and their discharge is prohibited except in accordance with regulations.[58] The *Vessel Pollution and Dangerous Chemicals Regulations* outline the conditions for legal discharges of oily mixtures, including the concentration of the solution.[59] The Regulations do not currently allow for the establishment of no-discharge zones, though this may be an avenue for legal reform in the future.[60]

The risk of large-scale oil spills in the vicinity of Scott Islands mNWA is in part addressed by the Voluntary Tanker Exclusion Zone and the *Oil Tanker Moratorium Act*, described in Box 2, below. Together, these measures greatly reduce the risk that loaded oil tankers travel within the vicinity of the Scott Islands. However, even spills from unloaded commercial vessels can be consequential and cause significant local impacts.[61]

Despite the Regulations under the CSA, chronic small-scale oil spills, whether accidental or intentional, also pose a threat, and are not addressed by the Act. Though they are not as catastrophic as larger spills, they are more difficult to monitor and manage. Monitoring through aerial surveillance does not necessarily deter ships from these illegal discharges, and they are often in remote locations and therefore difficult to address.[62]

Vessel routeing

Vessel routeing is perhaps the only way to mitigate the risk of all forms of oil discharge and spills, by ensuring that commercial vessels maintain an appropriate distance from the mNWA. This could be accomplished in several ways. First, vessel traffic could be prohibited in the portion of the mNWA that is within Canada's territorial sea. This would displace cruise ship and other vessel traffic through the Scott Islands, reducing the risk of oil damage in the nearshore area and to the terrestrial protected areas. A routeing measure such as this could be designed to include vessels of a specific size or type, so that vessel traffic servicing local communities would not be impacted.

Second, there are powers under the CSA to reroute vessels carrying, discharging or at risk of discharging a pollutant in Canadian waters and the EEZ. Under section 175.1, a pollution response officer may direct ships carrying pollutants, which includes oil, to proceed by a route and at a speed they specify.[63] And under section 189, the Minister of Transport may direct a vessel that could discharge a prescribed pollutant, including oil, to proceed by a route and

57 O'Hara, P.D. and Davidson, P.J.A. 2009. Aerial Surveillance and Oil Spill Impacts Based on Beached Bird Survey Data Collected in Southern British Columbia. Marine Ornithology 37; pp 61-65.

58 Canada Shipping Act, 2001, s pra note 15, s 187; Ves l Pollution and Dangerous Chemia l Regulations SOR/2012-69, s 4(a).

59 Ves l Pollution and Dangerous Chemia l Regulations, s pra note 60, s 1(1) "Set ion II waters" s 31. As noted in the legal framework analy s s e t ion 3.2.1.4, the regulations are s ightly more permis e of dis arge within "Set ion II waters" where So tt Is and marine NWA is loa ted.

60 For ea mple, the Ves l Pollution and Dangerous Chemia l Regulations do identify "des gnated s wage areas" where s wage dis arge is res ric ed unles it is pas d through an approved marine sanitation device and the effluent meets strict fecal coliform standards. See Vessel Pollution and Dangerous Chemical Regulations, SOR/2012-69, s pra note 60, s 96.

61 See, for example, R v Kirby Offshore Marine Operating LLC, 2019 BCPC 185; Lindsay, B. "We're the ones that have to live here": Heiltsuk Still Feel Impact of Fuel Spill. CBC News (13 Oct 2017). Online: b c a /news/ a nada/britis -co lumbia/tug-s nk ng-bella-bella-1.4352953

62 O'Hara, P.D., Davidson, P.J.A. 2009. Aerial Surveillance and Oil Spill Impacts Based on Beached Bird Survey Data Collected in Southern British Columbia. Marine Ornithology 37; pp 61-65.

63 CSA, s pra note 15, s 175.1(1)(b); and s e s 165 "pollutant."

at a speed as specified.[64] These measures might be inefficient in practice, because each individual ship passing through the Scott Islands mNWA would need to be identified by the Minister or a pollution response officer. However, it may be possible to introduce a general measure that identifies Scott Islands as an area that the Minister or a pollution response officer would never designate as part of a routeing order made under these sections.

Finally, the Minister of Transport may introduce compulsory or recommended shipping routes in order to protect the marine environment under section 35.1(1)(j) of the CSA. These regulations may apply to all vessels, Canadian and foreign, within Canadian waters and the EEZ.[65] This power could be used to establish routes that reduce the risk of chronic or acute spills within the Scott Islands mNWA.

In other parts of Canada, shipping traffic has been managed more proactively within NWAs. For example, a permit is required to enter NWAs with marine components in Nunavut.[66] These NWAs extend to the limit of the territorial sea. CWS could introduce similar measures within the territorial sea portion of the Scott Islands mNWA.

RECOMMENDATION #1:

Introduce measures to regulate vessel routeing. The *Canada Shipping Act, 2001* (CSA) provides multiple powers to reroute vessels carrying, discharging or at risk of discharging a pollutant in Canadian waters and the Exclusive Economic Zone (EEZ). These can include absolute restrictions, recommended or compulsory routes and no-go zones. In other National Wildlife Areas (NWAs), ships wishing to enter the NWA require a permit. Restrictions on vessel routeing are a useful tool to address all of the impacts of shipping, including oil spills, disturbance and vessel strikes, underwater noise, and vessel discharges.

64 Ibid, s 189(c); and see s 185 "pollutant."
65 Ibid, s 8(b), 35.1(1)(j).
66 See footnote 47.

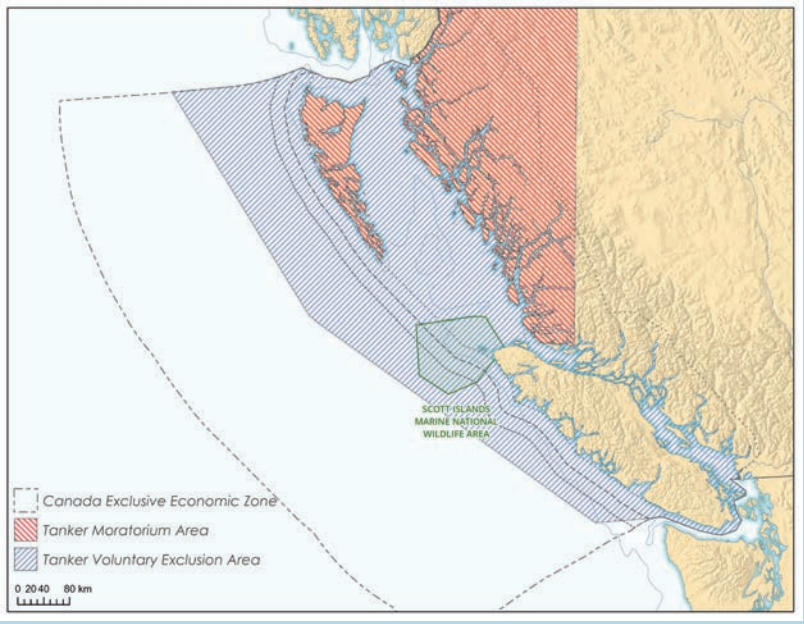
Box 2: Voluntary Tanker Exclusion Zone and the Oil Tanker Moratorium Act

On the Pacific coast, a Voluntary Tanker Exclusion Zone has been in place since 1985. The boundary of the area was based on models of possible worst-case scenarios of the drift of a disabled tanker with cargo (Figure 7). The exclusion zone requires loaded oil tankers travelling between Valdez, Alaska, and Puget Sound, Washington, to travel outside the exclusion zone boundary, west of Vancouver Island and Haida Gwaii. It does not apply to tankers travelling to and from Canadian ports, a gap which appears to have been filled between the 1980s and 2000s through a de facto oil tanker moratorium policy on BC's north coast.[67,68]

A complementary measure to the Voluntary Tanker Exclusion Zone, the *Oil Tanker Moratorium Act*, was introduced in 2019. This moratorium applies to the area from the northern Canada-United States border in BC to the point on BC's mainland across from the northern tip of Vancouver Island (Figure 7).[69] The Act prohibits oil tankers carrying more than 12,500 tonnes of crude oil or persistent oil products as cargo from stopping, loading or unloading at ports or marine installations in the moratorium area. It also prohibits the transport of oil between tankers and ports or marine installations, closing a potential loophole where crude or persistent oil could be shuttled to or from tankers moored offshore. While tanker travel in the area is not technically illegal, in practice the combination of the Tanker Exclusion Zone and the *Oil Tanker Moratorium Act* greatly reduces the potential for oil tankers to travel along BC's north coast, including within the Scott Islands mNWA.

Figure 7. Boundaries of the Voluntary Tanker Exclusion Zone and the area under the Oil Tanker Moratorium Act

Map displaying the boundaries of the Voluntary Tanker Exclusion Zone and the area under the *Oil Tanker Moratorium Act* (2019), relative to the Scott Islands mNWA.



67 Smith, supra note 621; Transport Canada. Safe Routing, Reporting and Restrictions for Vessels Online: tc.canada.ca/en/marine-transportation/marine-safety/safe-routing-reporting-restrictions-vessels

68 Living Oceans Society. 2011. Shipping on the British Columbia Coast. Current Status, Projected Trends, Potential Casualties, and Our Ability to Respond: A Briefing Report. Sointula, BC: Living Oceans Society.

69 Transport Canada. Oil Tanker Moratorium on British Columbia's North Coast. Online: tc.canada.ca/en/marine-transportation/marine-safety/oil-tanker-moratorium-british-columbia-s north-coast; Canadian Coast Guard, Notices to Mariners 1 to 46 Annual Edition 2019, supra note 316, section A5, notice 10, article 2.5.

PREDATOR INTRODUCTION

The introduction of invasive and predatory species to islands is one of the greatest threats to nesting seabirds and can lead to the extinction of island bird species. This has already occurred in the Scott Islands: mink and raccoons were introduced to Lanz and Cox islands in the 1930s for fur trapping, and it is presumed that the introduction of these animals resulted in the extirpation of Cassin's auklets and rhinoceros auklets.[70] Domestic cats have also periodically been left on the islands by fishers.[71]

The bird colonies on the Triangle, Sartine and Beresford Islands are vulnerable to predator introductions, namely from rats that could jump from ships or be deposited on the islands from disabled boats or lost cargo. The possibility of the introduction of rats to these islands could have disastrous consequences for breeding birds.

Currently, research teams visiting the island adhere to strict protocols to prevent any introductions. Rats might also be introduced to the islands via shipwrecks. A model of rodent introduction risk to island ecosystems in Alaska found that the density of near-shore fishing activity and volumes of nearby shipping traffic were the best predictors of shipwrecks which could result in accidental introductions.[72]

Legal options

The *Scott Islands Protected Marine Area Regulations* have introduced legal measures to address this risk, including a prohibition on introducing "any living organism that is likely to harm wildlife or degrade the quality of wildlife habitat" within the area;[73] a prohibition on coming within 300m of the low water mark of the Triangle, Sartine or Beresford Islands;[74] and a prohibition on anchoring a vessel of more than 400 gross tonnes within one NM of the low water mark of the Triangle, Sartine or Beresford Islands.[75]

These provisions provide some protection to the area from the risk of invasive species, primarily in the form of predator introduction. However, there is a risk of introduction of other invasive species through shipping activities such as greywater discharge and ballast water exchange. These invasive species could be equally harmful to birds and other species and could contravene the Scott Islands conservation and management objectives as well. These risks are not thoroughly addressed in the Scott Islands Regulations. Legal and management measures to address these risks are discussed below in the sections on greywater, sewage and ballast water.

70 BC Parks. 2003. Lanz and Cox Islands Provincial Park Purpose Statement and Zoning Plan. Online: bcparks.ca/planning/mgmtplns/lanzcox/lanz_ps pdf?v=1472509570230

71 Drever, M. 2002. Important Bird Area Conservation Plan for the Scott Islands Canadian Nature Federation. Online: ibacanada.com/documents/conservationplans/scottislands pdf

72 Renner, M., Nelson, E., Watson, J., Haynie, A., Poe, A., Robards, M. and S.C. Hess. 2018. The Risk of Rodent Introductions from Shipwrecks to Seabirds on Aleutian and Bering Sea Islands Biological Invasions Online: doi.org/10.1007/s10530-018-1726-z

73 Scott Islands Protected Marine Area Regulations, supra note 14 at s 2(1)(c).

74 Ibid. at s 2(1)(e).

75 Ibid. at s 2(1)(f).

VESSEL DISTURBANCE AND VESSEL STRIKES

Vessel transit through the Scott Islands mNWA can result in disturbance to seabirds while at sea and can cause serious injury and death of marine mammals as a result of vessel strikes.

Vessel traffic has been found to result in changes in behaviour and distribution patterns of seabirds on the water.[76] These include everything from energetically costly responses such as causing birds to take flight, or dive, to physiological stress responses, such as elevated heart rates. Though different species respond differently to vessels, disturbances can disrupt foraging behaviours and feeding times, which are particularly important to birds foraging during their breeding seasons. Implementation of low-disturbance or disturbance-free zones for seabirds have been put forward as management actions to mitigate the risk of these impacts in other jurisdictions.[77]

Whales are particularly vulnerable to ship strikes, often resulting in death or serious injury. Fin and humpback whales, two of the cetacean species found in the Scott Islands mNWA,[78] are the most common victims of ship strikes in BC. Vessel strikes are also a known threat to the two endangered species of sea turtle (leatherback and loggerhead turtles) known to occur in BC waters and within the area of the mNWA.[79]

Vessel speed is one of the primary predictors of ship strike frequency and in the severity of collisions, and vessels operating within Scott Islands mNWA travel at speeds consistent with ship strike mortality for cetaceans (see Figure 8). Vessel speed regulations have been shown to be somewhat effective in mitigating ship strikes. For example, research on ship strikes to North Atlantic right whales (NARW) on the Atlantic coast estimated that vessel speed restrictions reduced mortality of whales by 80 to 90 per cent;[80] however, more recent modelling demonstrates that there is no speed at which large vessels could strike a whale without significant risk of lethal injury, and that the speed limits commonly discussed (i.e. 10 knots) would provide only small reductions in the probability of lethal ship strikes.[81]

The Scott Islands mNWA has been identified as an "Important Area" for known concentrations of humpback whales as part of the Ecologically and Biologically Significant Area identification process.[82] The Management Plan also notes that marine mammal strikes are a potential impact of vessel traffic in the area. However, the 2016 and 2018 Regulatory Impact Analysis Statements for the mNWA did not address threats or risks of vessel disturbance or vessel strikes within the area, and the *Scott Islands Protected Marine Area Regulations* do not provide any measures to reduce the impacts of vessel disturbance and strikes.

76 Schwemmer, P., Mendel, B., Sonntag, N., Dierschke, V. and S. Garthe. 2011. Effects of Ship Traffic on Seabirds in Offshore Waters: Implications for Marine Conservation and Spatial Planning. Eo logia l Applia tions 21(5); pp 1851-1860.

77 Fliessbach, K.L., Borkenhagen, K., Guse, N., Markones, N., Schwemmer, P. and S. Garthe. 2019. A Ship Traffic Disturbance Vulnerability Index for Northwest European Seabirds as a Tool for Marine Spatial Planning. Frontiers in Marine Sciene 6.

78 Gregr, E.J., Calambok dis J , Conve y, L., Ford, J K.B., Perry, R.I., Spave n, L. and M. Zab arias 2006. Reo ve ry Strategy for Blue, Fin, and Sei Whales (Balaenoptera musculus, B. physalus, and B. borealis) in Pacific Canadian Waters. Species at Risk Act Recovery Strategy Series. Vancouver: Fisheries and Oceans Canada. vii + 53 pp; Fisheries and Oceans Canada. 2013. Recovery Strategy for the North Pacific Humpback Whale (*Megaptera novaeangliae*) in Canada. *Species at Risk Act* Reo ve ry Strategy Series Fish eries and Oe ans Canada, Ottawa. 67 pp.

79 Species at Risk Public Registry. 2017. Action Plan for the Leatherback Sea Turtle (Dermochelys coriacea) in Canada (Pacific population); Species at Risk Public Registry. Species Profile: Loggerhead Sea Turtle. Online: wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1090

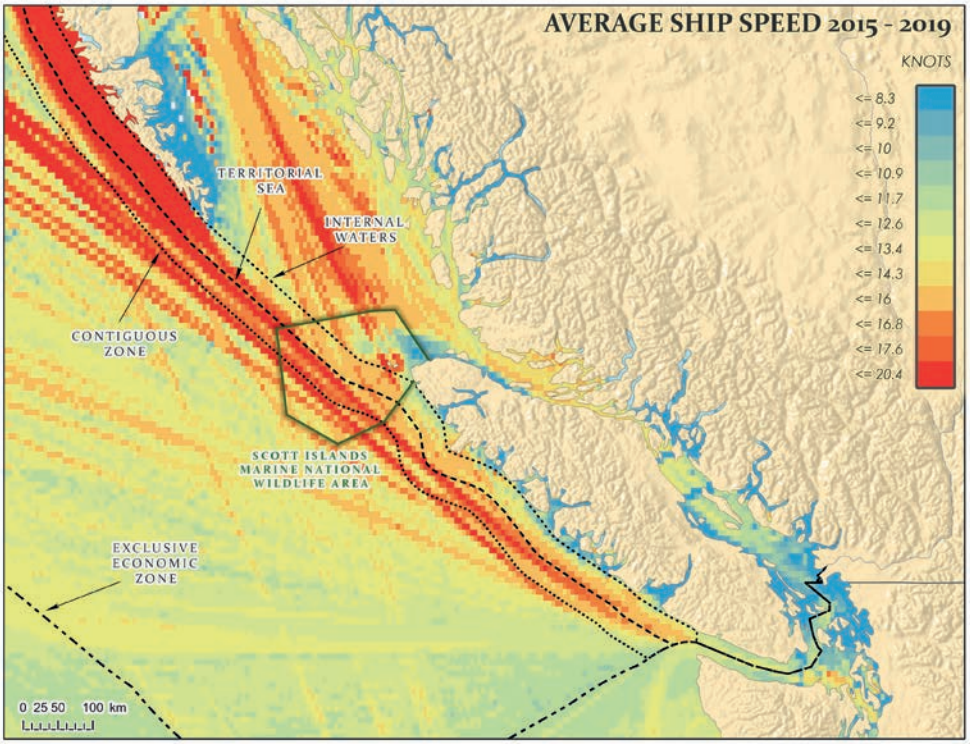
80 Conn, P.B. and Silber, G.K. 2013. Vese l Speed Ret rit ions Reduce Rik of Collis on-Related Mortality for North Atlantic Right Whales Eo p here, 4(4); pp 1-16.

81 Kelly, E.K., Vlas ç J P. and S.W. Brilliant. 2020. Ae is ng the Lethality of Ship Strike s on Whales Us ng Simple Biophy a l Models Marine Mammal Sc ene , pp 1-17. Online: doi.org/10.1111/mms.12745

82 Jamieson, G.S. and Levesque, C. 2014. Identification of Ecologically and Biologically Significant Areas on the West Coast of Vancouver Island and the Strait of Georgia, and in Some Nearh ore Areas on the North Coat : Phae II – Dei gnation of EBSAs DFO Canadian Sc ene Adv o ry Sec etariat Ree arh Document. 2014/101. iv i + 36 pp at 8.

Figure 8. Average 2015-2019 ship speeds for the South Coast of BC

Map displaying average ship speeds in knots for the South Coast of British Columbia from 2015 to 2019. Average speeds were derived from AIS point locations across all available ship types on a per-pixel basis. See ***Appendix D*** for a breakdown by individual ship types.



Legal options

The *Scott Islands Protected Marine Area Regulations* do not provide any measures to reduce the risk of vessel disturbance and vessel strikes, nor are there any existing measures under the CSA or other statutes or regulations that would address these issues.

Speed reduction

Speed reduction measures could be introduced through complementary measures to the MPA, or via measures within the Scott Islands mNWA Regulations themselves.

The legislative authority to introduce complementary speed reduction measures can be found under the CSA. Under that Act, the Minister of Transport may make general regulations for the purpose of protecting the marine environment.[83] These regulations can be made to apply to all Canadian and foreign vessels within Canadian waters and the EEZ.[84] They may include measures that regulate ship navigation (including speed restrictions) within the mNWA. The CSA also allows the Minister of Transport to introduce the same measures via an interim order, which can last up to one year.[85] Such an order may be extended for a further two years, or be established more permanently through regulation.

These powers have been used on the Atlantic coast to introduce a seasonal speed restriction zone to reduce the risk of fatal ship strikes to NARW in the western portion of the Gulf of St. Lawrence. Within the "dynamic" sectors of the speed restriction zone, vessels may proceed at safe operational speeds unless NARW are present. The restrictions are in place from April until November, and a voluntary speed reduction is in place for vessels in the presence of the whales at all times. Speed reductions are posted monthly as Notices to Mariners (NOTMAR) and Notices to Shipping.

83 CSA, supra note 15, s 35.1(1), 136(1).
84 Ibid., s 8(b), which states that s 35.1(1) applies to "foreign vessels in waters in the exclusive economic zone of Canada."
85 Ibid., s 10.1.

Measures could also be introduced into the *Scott Islands Protected Marine Area Regulations* that introduce speed restriction zones or seasonal speed restrictions. The Regulations could also mandate that these measures be introduced through management planning.

RECOMMENDATION #2:

Introduce measures to regulate vessel speed. The CSA grants Transport Canada (TC) the authority to regulate navigation within Canadian waters and the EEZ. This authority has been used on the Atlantic and Pacific coasts to reduce risks to threatened whale species, and it could be used to address vessel disturbance, strikes and noise within Scott Islands marine National Wildlife Area (mNWA). Reductions in vessel speed can also play a large role in reducing underwater noise.[86]

Approach distances

The Minister of Transport may also establish approach distances from whales within the mNWA under sections 35.1 and 136 of the CSA. The Minister of Transport has relied on these provisions to issue interim orders in 2019 and 2020 that protect southern resident killer whales (SRKW). These measures include a requirement that vessels maintain a 400m approach distance from SKRW; a requirement that whale-watching boats maintain a 200m to 400m approach distance, if so authorized; and the introduction of "interim sanctuary zones" for SRKW by creating vessel no-go zones in the waters off of Saturna Island, Pender Island and Swiftsure Bank.[87]

Similar measures could be introduced to protect marine wildlife, including whale and seabird populations, within the Scott Islands mNWA. ECCC has seabird avoidance guidelines, which require vessels to maintain distance sufficient to avoid disturbing nesting seabirds, to avoid concentrations of seabirds on the water, and several other measures. However, these guidelines are non-binding, and other migratory bird legislation still applies.[88]

Vessel routeing

As noted above in the "Oil discharges and spills" section, the Minister of Transport may introduce compulsory or recommended shipping routes in order to protect the marine environment under section 35.1(1)(j) of the CSA. These regulations may apply to all vessels, Canadian and foreign, within Canadian waters and the EEZ.[89] This power could be used to introduce low-disturbance or disturbance-free zones within known feeding and foraging zones, as well as in areas adjacent to nesting bird colonies, in order to reduce the impacts of vessel disturbance on seabirds.

See Recommendation #1: Introduce measures to regulate vessel routeing.

86 IMO MEPC.1/Circ 833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life. Information Document 3.2.1. ASCOBANS Advisory Committee Meeting, 29 September-1 October 2014. Sweden. ascobans.org/sites/default/files/document/AC21_Inf_3.2.1_IMO_NoiseGuidelines.pdf

87 Interim Order for the Protection of Killer Whales (Orcinus orca) in the Waters of Southern British Columbia, May 27, 2019 (pursuant to Canada Shipping Act, 2001); Interim Order for the Protection of Killer Whales (Orcinus orca) in the Waters of Southern British Columbia, 2020, May 31, 2020 (pursuant to Canada Shipping Act, 2001).

88 Government of Canada. 2018. Guidelines to Avoid Disturbance to Seabird and Waterbird Colonies in Canada.

89 CSA, supra note 15, s 8(b), 35.1(1)(j).

UNDERWATER NOISE

Across the world's oceans, low-frequency underwater noise has doubled since 1960, largely due to shipping.[90] This has impacted marine life, especially marine mammals that rely on the acoustic environment, by affecting communication, hunting and feeding; forcing animals to avoid preferred habitats; and increasing stress hormones, all of which has led to fewer offspring and higher death rates.[91] In areas of high vessel density, the impacts on these animals are increased because of the continual and chronic input into the marine environment. Therefore, while there may be a need to directly regulate the noise generated from vessels (e.g., through vessel design regulation, such as hull design and engine type), an indirect way to reduce noise impacts in Scott Islands is to reduce or limit the volume and speed of vessel traffic.

The development of the Scott Islands mNWA was significantly influenced by recognition of the importance of offshore feeding grounds, which provide an important source of deepwater zooplankton for the seabirds nesting on the islands.[92] Seabirds that dive to forage for their food may use, or be sensitive to, underwater sounds. Underwater hearing has only been measured for a few species of diving birds, but research indicates that they respond to and use sounds underwater.[93] This may make birds vulnerable to impacts of underwater anthropogenic noise during foraging.

Several species of marine mammals, including cetaceans and seals, also transit and use the productive waters within the area of the mNWA. Several areas off the BC coast present opportunities to implement noise restrictions in areas where lower levels of noise overlap with areas of higher animal density, in order to conserve areas that are acoustic sanctuaries, or refugia.[94]

The International Union for Conservation of Nature (IUCN) has recommended the establishment of noise restrictions in MPAs to achieve relatively undisturbed seascapes significantly free of human disturbances.[95] The reduction of direct injury or mortality from ship strikes and the sub-lethal behavioural effects of underwater noise pollution were also components of the IUCN's call for action to achieve the Sustainable Development Goal 14 (conserve and sustainably use the oceans, seas and marine resources for sustainable development).[96]

Legal options

As noted above, the *Scott Islands Protected Marine Area Regulations* permit the navigation of vessels through the mNWA in accordance with the CSA. There are currently no measures under the CSA or any other Canadian legislation that address underwater noise. However, there are existing legal tools that can mitigate underwater noise and its impacts within the Scott Islands mNWA, including speed restrictions, vessel routeing and monitoring (discussed in greater detail below).

The Government of Canada is developing the Ocean Noise Strategy to address underwater noise. One guiding principle of this strategy is the precautionary approach, that "a lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to reduce the effects of anthropogenic underwater noise" and to take a risk-based approach by assuming that "adverse consequences increase with increased exposure to underwater noise."[97]

90 International Maritime Organization. 2020. Ship Noise. Online: imo.org/en/MediaCentre/HotTopics/Pages/Noise.aspx

91 WWF-Canada. 2017. Underwater Noise from Arctic Shipping: Impacts Regulations and Recommendations Online: wwf.ca/wp-content/uploads/2020/03/Underwater-noise-from-Arctic-Shipping-impacts-regulations-andrecommendations_April-2017.pdf

92 Bertram, D.F. 2019. Oil Spill Settlement Funds Directed to Seabird Conservation. Marine Policy 108. Online: doi.org/10.1016/j.marpol.2019.103622

93 Hansen, K.A., Larsen, O.N. and M. Wahlberg. 2016. Underwater Hearing in the Great Cormorant (Phalacrocorax carbo sinensis): Methodological Considerations. Fourth International Conference on the Effects of Noise on Aquatic Life, Volume 27, 010015. Online: doi.org/10.1121/2.0000267; Crowell, S.C. 2016. Measuring In-Air and Underwater Hearing in Seabirds, in: Popper, A.N., Hawkins, A. (Eds.), The Effects of Noise on Aquatic Life II. Springer New York: New York, NY. pp 1155-1160.

94 Williams R., Erbe, C., Ashe, E. and C.W. Clark 2015. Quiet(er) Marine Protected Areas Marine Pollution Bulletin. 100, pp 154-161. Online: doi.org/10.1016/j.marpolbul.2015.09.012

95 Day, J., Dudley, N., Hockings, M., Holmes, G., Laffoley, D., Stolton, S. and S. Wells. 2012. Guidelines for Applying the IUCN Protected Area Management Categories to Marine Protected Areas IUCN.

96 IUCN. 2017. IUCN Position on SDG14 -Call for Action. The Ocean Conference, New-York, 5-9 June 2017. Online: iucn.org/sites/dev/files/sdg14_conference_2017_iucn_position_paper.pdf

97 Government of Canada. 2020. Ocean Noise Strategy for Canada: Discussion Document. Online: dfo-mpo.gc.ca/oceans/consultations/noise-bruit/ocean-noise-strategy-strategie-bruit-oceans eng.pdf

Canada should draw on international guidance and standards for measuring and mitigating underwater noise levels. For example, the European Union Marine Strategy Framework Directive (2008/56/EC) suggests that the annual average ambient noise level should not be greater than 100 decibels,[98] though shipping noise in some areas of the BC coast exceeds this.[99] In addition, the International Maritime Organization (IMO) has recognized that underwater noise can have short- and long-term negative consequences on marine life, and it has released *Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life*.[100]

Speed reduction

Reducing ship speed is an effective means of reducing underwater noise. Underwater noise could be addressed through the Minister of Transport's power to make general regulations for the purposes of protecting the marine environment under the CSA.[101] As noted above, these regulations can be made to apply to all Canadian and foreign vessels within Canadian waters and the EEZ.[102] These measures may also be introduced through an interim order.[103]

A voluntary slow-down program initiated by the Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation (ECHO) Program has shown promising results.[104] The program, which began in 2017, introduced a voluntary slow down for commercial ships transiting Haro Strait and Boundary Pass in the Juan de Fuca Strait from early July to October.[105] This program was successful in gaining participation, with 82 per cent of large commercial ships voluntarily slowing down in 2019, and was effective in reducing underwater noise intensity by half.[106] Given the known greater efficacy of mandatory measures, this indicates that mandatory speed reduction measures should be considered as an effective solution to underwater noise, particularly in areas of low compliance.[107]

See Recommendation #2: Introduce measures to regulate vessel speed.

Vessel routeing

A 2013 workshop on underwater noise in Canada's Pacific recommended that noise-producing activities be excluded altogether from certain sensitive habitat areas.[108] This could be accomplished through the Minister of Transport's vessel routeing powers to protect the marine environment, discussed above in "Oil discharges and spills." The Minister of Transport may introduce compulsory or recommended shipping routes, and may regulate navigation, in order to protect the marine environment.[109] These regulations may apply to Canadian and foreign vessels within Canadian waters and the EEZ.[110]

See Recommendation #1: Introduce measures to regulate vessel routeing.

98 Tasker, M.L., Amundin, M., Andre, M., Hawkins, A., Lang, W. and T. Merck. 2010. Marine Strategy Framework Directive: Task Group 11 Report and Other Forms of Energy Underwater Noise. Online: doi.org/10.2788/87079

99 Erbe, C., MacGillivray, A. and Williams, R. 2012. Mapping Cumulative Noise from Shipping to Inform Marine Spatial Planning. Journal of the Acoustical Society of America 132(5). Online: doi.org/10.1121/1.4758779

100 IMO MEPC.1/Circ 833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life (30 July 2014).

101 CSA, supra note 15, s 35.1(1), 136(1).

102 Ibid., s 8(b), which states that s 35.1(1) applies to "foreign vessels in waters in the exclusive economic zone of Canada."

103 Ibid., s 10.1.

104 Vancouver Fraser Port Authority. Enhancing Cetacean Habitat and Observation (ECHO) Program. Online: portvancouver.com/environmental-protection-at-the-port-of-vancouver/maintaining-healthy-ecosystems throughout-our-jurisdiction/echo-program

105 The slow-down requirement was 14.5 knots or less through the water for vehicle carriers cruise ships and container vessels and 11.5 knots or less through the water for bulkers tankers ferries and government vessels

106 Vancouver Fraser Port Authority. 2020. ECHO Program: 2019 Voluntary Vessel Slowdown Trial in Haro Strait and Boundary Pass. Summary findings. Online: portvancouver.com/wp-content/uploads/2020/08/ECHO-Program-2019-voluntary-vessel-slowdown-in-Haro-Strait-and-Boundary-Pass-final-report.pdf

107 See Whitney, C.K., et al. 2016. Impreciseand Weakly Assessed: Evaluating Voluntary Measures for Management of Marine Protected Areas Marine Policy 69, 92: "Very few papers (only 20 of 144) provided thorough assessments of voluntary measures of these, less than a quarter pointed to useful outcomes in connection with voluntary measures for MPAs or marine conservation more broadly, while half indicated mixed or uncertain results The main factor to which failure of voluntary measures was attributed was the lack of leverage to discourage non-compliance."; See also McKenna, M.F., et al. 2012. Response of Commercial Ships to a Voluntary Speed Reduction Measure: Are Voluntary Strategies Adequate for Mitigating Ship-Strike Risk? Coastal Management 40, 634; Silber, G.K., Adams, J D. and C.J Fonnesbeck 2014. Compliance with Vessel Speed Restrictions to Protect North Atlantic Right Whales Peer Journal 2, e399.

108 WWF-Canada. 2013. Finding Management Solutions for Underwater Noise in Canada's Pacific. Vancouver Aquarium and WWF-Canada, Vancouver, BC.

109 CSA, supra note 15, s 35.1(1).

110 Ibid., s 8(b), 35.1(1)(j).

Management and monitoring of underwater noise

Measures to manage and monitor underwater noise could also be included within the Scott Islands mNWA Management Plan. Recommended measures include noise monitoring in key areas and inclusion of specific objectives in relation to noise, such as a goal of no net increase in underwater anthropogenic noise for important areas that are currently subject to low noise levels.[111]

RECOMMENDATION #3:

Establish vessel and noise monitoring programs for the mNWA. Vessel and noise monitoring programs have occurred in marine protected areas (MPAs) such as SGaan Kinghlas-Bowie Seamount[112] and the Gully.[113] Similar programs have been established in United States National Marine Sanctuaries.[114] Expanding the use of these indicators and monitoring programs to other Canadian MPAs will increase understanding of human activities and anthropogenic noise and ensure the efficacy of measures taken to address these issues.

111 WWF-Canada. 2013. Finding Management Solutions for Underwater Noise in Canada's Pacific. Vancouver Aquarium and WWF-Canada, Vancouver, BC.

112 DFO. 2011. SGaan Kinghlas Bowie Seamount Marine Protected Area Monitoring Indicators Protocols and Strategies DFO Canadian Science Advisory Secretariat Science Advisory Report. 2010/036; NEMES. 2015. Workshop on Vessels and Noise at SGaan Kinghlas Bowie (SK-B) Seamount MPA. nemesprojects.com/2015/02/20/workshop-on-vessels-and-noise-at-sgaan-kinghlas-bowie-sk-b-seamount-mpa/

113 DFO. 2010. Gully Marine Protected Area Monitoring Indicators Protocols and Strategies DFO Canadian Science Advisory Secretariat Science Advisory Report. 2010/066.

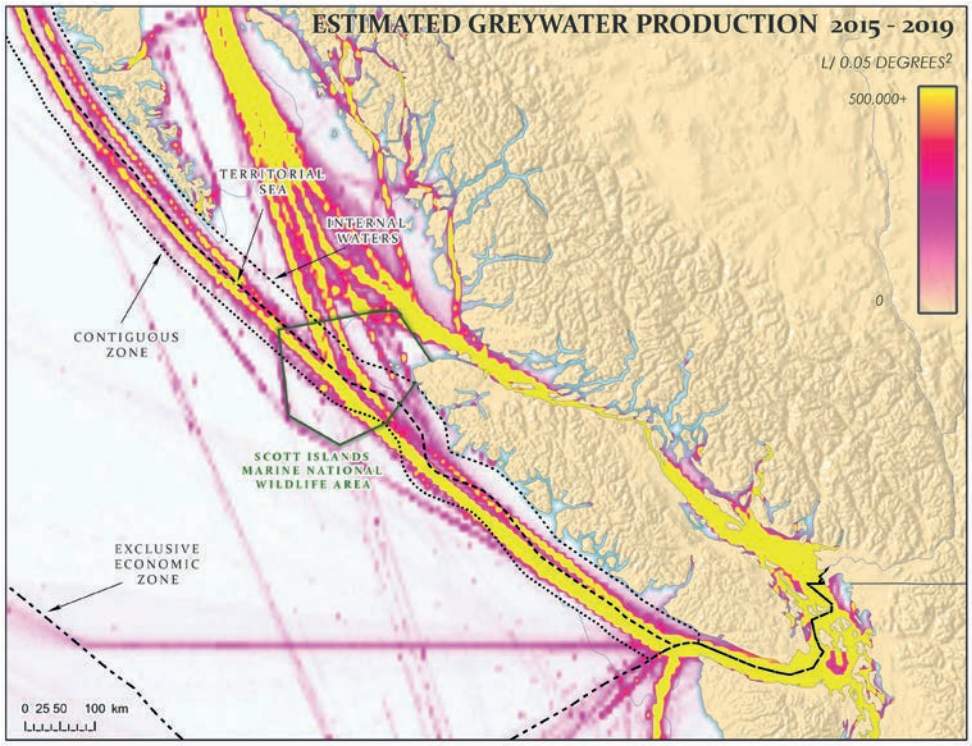
114 NOAA. National Marine Sanctuaries Sound Monitoring. Accessed 12 December 2020. sanctuaries.noaa.gov/science/monitoring/sound/

GREYWATER

Greywater, characterized as drainage from sinks, laundry machines, bath tubs, shower stalls or dishwashers, can have pollution levels comparable to untreated sewage.[115] It can contain a variety of pollutants; it can increase the amount of nutrients in the surrounding water, causing algal blooms and anoxic dead zones; and it can spread harmful bacteria and disease, posing risks to human health.[116] In 2017, it was estimated that an annual total of 1.54 billion litres of greywater was been generated on the BC coast, with 1.37 billion litres of that total generated by vessels associated with tourism, including cruise ships and yachts.[117] Cruise ship traffic commonly transits through the Scott Islands, between Beresford Island and the Lanz and Cox Islands. An estimated 143.9 million litres of greywater have been produced and potentially discharged in the mNWA during the period of January 2015 to December 2019 (see Figure 9).

Figure 9. Cumulative 2015-2019 ship greywater generation for the South Coast of BC

Map displaying cumulative ship greywater generation for the South Coast of British Columbia from 2015 to 2019 as represented by total litres per 0.5 degrees.[2] Estimates were derived from AIS point locations across all available ship types in combination with coefficients of greywater production. See ***Appendix E*** for a breakdown by individual ship types.[118]



115 Vessel Pollution and Dangerous Chemicals Regulations, SOR/2012-69 at s 131.1(1).

116 Nowlan, L. and Kwan, I. 2001. Cruise Control – Regulating Cruise Ship Pollution on the Pacific Coast of Canada. West Coast Environmental Law. Online: georgiastrait.org/wp-content/uploads/2015/02/CruiseControl_WCEL.pdf

117 Vard Marine Inc. 2019. Greywater Generation Estimates for the BC Coast. Report #381-000. Produced for WWF-Canada. Online: wwf.ca/wp-content/uploads/2020/03/GREYWATER-GENERATION-ESTIMATES-FOR-THE-BC-Coast_June-2019.pdf

118 Vard Marine, Inc. 2019. Greywater Generation Estimates for the BC Coast. Ottawa, ON: Vard Marine. Online: wwf.ca/wp-content/uploads/2020/03/greywater-generation-estimates-for-the-bc-coast_june-2019.pdf

Legal options

The *Scott Islands Protected Marine Area Regulations* do not expressly address greywater discharges, and the Regulatory Strategy indicates that no restrictions were anticipated beyond existing CSA Regulations.[119] Additionally, the prohibition on dumping or discharging waste or other substances likely to harm wildlife or habitat within the mNWA does not apply to vessel navigation. It appears therefore that CWS considers greywater discharge to be an aspect of vessel navigation and therefore permitted within Scott Islands mNWA if consistent with the CSA and its Regulations.[120]

However, the prohibition to "introduce any living organism that is likely to harm wildlife or degrade the quality of wildlife habitat" *does* apply to vessel navigation. This means that greywater discharge, which is known to introduce pathogens in marine areas, should be prohibited within the mNWA according to its Regulation.[121]

Under the CSA, greywater and other discharges are governed by the *Vessel Pollution and Dangerous Chemicals Regulations*. The provisions on greywater apply to all vessels in waters under Canadian jurisdiction other than Arctic waters.[122]

The *Vessel Pollution and Dangerous Chemicals Regulations* define greywater as drainage from sinks, laundry machines, bath tubs, shower-stalls or dishwashers.[123] It does not include sewage, or drainage from machinery spaces or workshop areas.[124] The Regulation requires that any release of greywater by or from the vessel into the water does not result in deposit of solids or leave a sheen on the water.[125] The terms "solids" or "sheen" are undefined, and the type of substances allowed in greywater discharges are not specified.

Discharge prohibition and no-discharge zones

The Scott Islands mNWA could restrict the discharge of greywater within the entire mNWA, as is the case in the Banc-des-Américains MPA.[126] This would be consistent with foreign vessels' freedom of navigation, because greywater discharge does not serve a navigational purpose and is therefore not essential to foreign states' exercise of this freedom. An exception in the event of emergencies is already provided for in the *Vessel Pollution and Dangerous Chemicals Regulations*.[127] Another option is to identify a no-discharge zone under the *Vessel Pollution and Dangerous Chemicals Regulations* that encompasses the Scott Islands mNWA.

Alternatively, greywater discharges within Scott Islands mNWA could be required to meet a higher standard for treatment and effluent quality. This could be accomplished through provisions in the mNWA Regulation. It could also be established under the *Vessel Pollution and Dangerous Chemicals Regulations*, which has established areas where sewage discharge must meet a higher standard for fecal coliform count.[128]

119 Environment Canada. 2013. Regulatory Strategy for the Designation of the Proposed Scott Islands Marine National Wildlife Area, Table 2 "Summary of management approaches for current activities occurring within the proposed boundaries of the Scott Islands National Wildlife Area".
120 Scott Islands Protected Marine Area Regulations, supra note 14 s 5(b).
121 Ibid., s 2(1).
122 Ibid., s 131.1(2).
123 This definition is incorporated by reference into the recent Banc-des-Américains Marine Protected Area Regulations, SOR/2019-50.
124 Vessel Pollution and Dangerous Chemicals Regulations, supra note 60 s. 131.1(1).
125 Ibid., s 131.1(4).
126 Banc des Américains Marine Protected Area Regulations, supra note 124, s 6(b).
127 Vessel Pollution and Dangerous Chemicals Regulations, supra note 60, s 131.1(3).
128 Ibid., s 96.

RECOMMENDATION #4:

Introduce prohibitions on vessel discharges. The discharge of potentially harmful substances from vessels should be completely prohibited within the Scott Islands mNWA. This is consistent with the minimum protection standard on dumping within MPAs, which should be comprehensively defined to include all of these common vessel discharges.

Harmful substances include discharges of oily mixtures, greywater, sewage and ballast water, as well as other general vessel discharges. A number of legal options exist under the CSA and its Regulations to prohibit these discharges. For example, the waters of the Scott Islands mNWA have been designated as a no-discharge zone under the *Vessel Pollution and Dangerous Chemicals Regulations* and the *Ballast Water Control and Management Regulations*. A similar no-discharge zone could also be included within the *Scott Islands Protected Marine Area Regulations*. Another option is to require a higher standard of treatment for all effluents discharged within the area.

SEWAGE

Sewage discharge can introduce invasive species and produce fecal-contaminated waters, which pose health risks to humans who eat fish and bivalves from these areas.[129] Similar to greywater, and unlike physical transit or ballast water discharge, the release of sewage is unnecessary for safe and continuous navigation.

Although treated sewage is generally permitted for discharge (dependent on the type of vessel and area) by the *Vessel Pollution and Dangerous Chemical Regulations,* the IMO's Marine Environmental Protection Committee has found onboard sewage treatment plants fail to treat sewage to minimum standards up to 97 per cent of the time.[130] In light of these findings, all sewage should be considered unsafe for disposal in sensitive and important areas.

Legal options

Like greywater, the *Scott Islands Protected Marine Area Regulations* do not address sewage discharges, and the Regulatory Strategy indicates that no restrictions on sewage discharge were anticipated beyond existing CSA Regulations.[131] This similarly indicates that CWS considers sewage discharge to be an aspect of vessel navigation that is permitted within Scott Islands mNWA if consistent with the CSA and its Regulations.[132] However, it is prohibited to "introduce any living organism that is likely to harm wildlife or degrade the quality of wildlife habitat" does apply to pathogens that could be introduced through sewage discharges.[133]

The CSA regulates sewage discharge under the *Vessel Pollution and Dangerous Chemicals Regulations,* covered in greater detail in "Select laws affecting commercial shipping" in the "Canadian legal framework" section of *Navigating the Law*. Sewage discharge is strictly regulated in terms of location and concentration: within 3NM of the shoreline, the discharge of raw sewage is prohibited with few and specific exceptions.

The Regulations also create Designated Sewage Areas where vessel sewage effluent must meet a higher standard (a coliform count of less than 14/100mL versus a coliform count of less than 250/100mL in other areas).[134]

Discharge Prohibition and Designated Sewage Areas

As with greywater, the Scott Islands mNWA would benefit from a total prohibition on sewage discharge within the entire mNWA. This prohibition could be included within the *Scott Islands Protected Marine Area Regulations*, similar to the prohibition found in the *Banc-des-Américains Marine Protected Area Regulations*.[135]

Alternatively, the Scott Islands mNWA could be established as a Designated Sewage Area under the *Vessel Pollution and Dangerous Chemicals Regulations,* where sewage discharge would be required to meet a high standard for treatment and effluent quality. This would require ongoing monitoring and enforcement to ensure that vessels transiting Scott Islands meet this standard.

See Recommendation #4: Introduce prohibitions on vessel discharges.

129 Smith, J.J. and Riddle, M. 2009. Sewage Disposal and Wildlife Health on Antarctica. Health of Antarctic Wildlife: A Challenge for Science and Policy. Springer, Berlin Heidelberg, Germany. pp 271.
130 MEPC 71/INF.22, "Updated information and analysis based on tests on the effluent of sewage treatment plants," s 6.
131 Environment Canada. 2013. Regulatory Strategy for the Designation of the Proposed Scott Islands marine National Wildlife Area, Table 2 "Summary of management approaches for current activities occurring within the proposed boundaries of the Scott Islands National Wildlife Area."
132 As per Scott Islands Protected Marine Area Regulations, supra note 14, s 5(b).
133 Ibid., s 2(c).
134 Vessel Pollution and Dangerous Chemicals Regulations, supra note 60, s 96.
135 Banc des Américains Marine Protected Area Regulations, supra note 124, s 6(b).

BALLAST WATER

Ballast water can carry pathogens and invasive organisms[136] and is a potential threat to the Scott Islands mNWA ecosystem and conservation objectives. Introductions of marine species at other levels of the food web, such as phytoplankton or zooplankton, can also pose a threat to the marine ecosystem. In other regions of the Pacific coast, invasions of introduced zooplankton species have been found to be associated with declines in native and historically dominant species, and with declining fish populations.[137] Such introductions may impact higher levels of the food web, such as seabirds.

Legal options

The *Scott Islands Protected Marine Area Regulations* and the Scott Islands Regulatory Strategy do not address ballast water discharges. Ballast water discharges may be considered as an aspect of vessel navigation and therefore permitted within Scott Islands mNWA if consistent with the CSA and its Regulations.[138] However, the Regulations do prohibit the introduction of "any living organism that is likely to harm wildlife or degrade the quality of wildlife habitat," which would apply to invasive species that could be introduced through ballast water discharges.[139]

The CSA regulates ballast water under the *Ballast Water Control and Management Regulations.* These Regulations generally restrict ballast exchange outside of designated ballast water exchange zones for marine areas inside Canada's territorial sea and EEZ.

The Regulations are designed to minimize the introduction of harmful aquatic organisms or pathogens from ballast water into waters under Canadian jurisdiction.[140] They prohibit the release within the limits of Canada's EEZ of ballast water that was taken onboard a vessel outside of Canada's EEZ, with exceptions for emergencies.[141] If the requirements cannot be met, alternative exchange areas are provided in the Regulations.[142] One of the alternative exchange areas provided for in the Regulations incorporates protections for the SGaan Kinghlas-Bowie Seamount MPA by exempting waters within 50NM of the Bowie Seamount from the larger exchange area.[143]

Prohibition on ballast water exchange

The Scott Islands mNWA could be protected from invasive species and harmful aquatic organisms and pathogens by including a prohibition on exchanging ballast water within an appropriate distance of the mNWA. This could be established in the *Scott Islands Protected Marine Area Regulations*, or through the *Ballast Water Control and Management Regulations*, as has been done to protect SGaan Kinghlas-Bowie Seamount MPA.

See Recommendation #4: Introduce prohibitions on vessel discharges.

136 Ricciardi, A. 2016. Tracking Marine Alien Species by Ship Movements Proceedings of the National Academy of Sciences of the United States of America 113(20), pp 5470-5471.
137 Bollens, S.M., Breckenridge, J. K., Vanden Hooff, R. C. and J.R. Cordell. 2011. Mesozooplankton of the Lower San Francisco Estuary: Spatio-Temporal Patterns, ENSO Effects and the Prevalence of Non-Indigenous Species. Journal of Plankton Research 33(9), pp 1358–11-1377. doi.org/10.1093/plankt/fbr034; Cordell, J R. and Ransom, M. 2007. Biology of the Introduced Copepod Pseudodiaptomus inopinus in a Northeast Pacific Estuary. Marine Ecology Progress Series 333, pp 213-227. doi:10.3354/meps333213
138 As per Scott Islands Protected Marine Area Regulations, supra note 14, s 5(b).
139 Ibid., s 2(c).
140 Ibid., s 4(2). Ballast Water Control and Management Regulations, SOR/2011-237 [Ballast Water Control and Management Regulations], s 4(2), 6.
141 Ibid., s 6.
142 Ibid., s 6(4).
143 Ibid., s 6(4)(b).

GENERAL VESSEL DISCHARGES

As noted above, vessels can discharge a number of substances including oil, ballast water, greywater or sewage. Sometimes it may be more desirable to address these discharges on an individual basis, and sections for specific discharges are addressed above. In other circumstances, it may be more efficient or convenient to address vessel discharges as a general discharge category because multiple types of discharges threaten conservation objectives cumulatively. In addition, the federal government's commitment to prohibit dumping within MPAs, as part of its minimum protection standards initiative, should result in a broad prohibition on "dumping" within MPAs that is comprehensively defined to include all of these common vessel discharges.[144]

Legal options

The *Scott Islands Protected Marine Area Regulations* prohibit "dump[ing] or discharg[ing] any waste material or substance that is likely to harm wildlife or degrade the quality of wildlife habitat" within the mNWA, however this prohibition does not apply to the navigation of vessels in accordance with the CSA.[145] The Regulatory Strategy indicates that no restrictions on vessel discharges such as greywater, sewage, hazardous waste and garbage were anticipated beyond existing CSA Regulations.[146]

Under the CSA, the *Vessel Pollution and Dangerous Chemicals Regulations* and the *Ballast Water Control and Management Regulations* are the primary regulatory means of controlling vessel-source pollution in waters under Canadian jurisdiction. The standards for various discharges set out in these Regulations are additional or complementary to the standards set out in the *International Convention for the Prevention of Pollution from Ships, 1973* and the Protocols of 1978 and 1997 relating to the convention.

Under the CSA, vessels are prohibited from discharging oily bilge water with oil concentrations greater than 15 parts per million. There are other prohibitions or limitations on the release of other substances. It is an offence under the CSA if these limits are exceeded, and therefore also an offence under the *Scott Island Protected Marine Area Regulations*, as the vessel would no longer be transiting in accordance with the CSA.

Prohibition on dumping and discharge

As noted above, the federal government has committed to a prohibition on ocean dumping within all new MPAs, including mNWAs, as part of its initiative to establish minimum protection standards within MPAs.[147] Dumping should be comprehensively defined to include all of these common vessel discharges.[148] These standards are expected to be applied to existing protected areas as part of the regular cycle of management review. Because the Scott Islands mNWA management plan is still under review, there is an opportunity now to apply the prohibition on dumping and discharge, including general vessel discharges, within the mNWA. Ultimately, this prohibition can be incorporated into the Regulations by prohibiting dumping and discharge from vessels navigating through the mNWA.

See Recommendation #4: Introduce prohibitions on vessel discharges.

144 Conservation groups have called for a comprehensive definition of "dumping" in Fisheries and Oceans Canada's MPA minimum standards so that the definition includes various discharges from ships like oil, greywater, sewage, garbage, ballast water, exhaust gas cleaning system fluids and solid wastes. See, for example: wwf.ca/2019/11/25/got-99-problems dumping-one/

145 So tt Is ands Protec ed Marine Area Regulations, s pra note 14, s 2(b), 5(b).

146 Env ronment Canada. 2013. Regulatory Strategy for the Des gnation of the Propos d So tt Is ands marine National Wildlife Area, Table 2 "Summary of management approab es for c rrent ac iv ties oc rring within the propos d boundaries of the So tt Is ands National Wildlife Area."

147 Fis eries and Oe ans Canada. 2019. Protec ion Standards to Better Cons rve Our Oe ans

148 See wwf.ca /2019/11/25/got-99-problems dumping-one/

DISCUSSION

Though a significant amount of vessel traffic transits the waters around the Scott Islands, there has been little formal consideration of risks posed by vessels to the ecological components of the mNWA.

ASSESSMENT OF SHIPPING IMPACTS

The 2018 Regulatory Impact Analysis Statement for Scott Islands mNWA refers to research and analysis conducted by ECCC which found that, "as long as... navigation activities in the [mNWA] are carried out in accordance with existing legal requirements and voluntary measures that aim to minimize threats to wildlife, their adverse environmental effects are minimal, and they are therefore compatible with the conservation objectives" of the area.[149] Unfortunately, this research and analysis does not appear to be publicly available.

In comparison, in the development of *Oceans Act* MPAs, DFO undertakes an ecological risk assessment, which it uses to inform decisions on permitted or prohibited activities within the proposed MPA by identifying risks to conservation priorities posed by activities.[150] In the case of Scott Islands, DFO conducted an assessment of the risks from commercial fishing gear within the Scott Islands mNWA using this ecological risk assessment framework.[151]

The DFO assessment did not address other human activities such as commercial shipping and noted that "a broader evaluation across all human activities and potential stressors will be needed for a comprehensive ecosystem risk assessment in support of integrated ecosystem management planning in [Scott Islands] mNWA."[152] No such broader assessment or cumulative impact assessment has yet been performed or reported publicly. The fisheries-related risk analysis can serve as a model for a more thorough examination of potential risks from shipping within the mNWA.

The 2016 Regulatory Impact Analysis Statement for Scott Islands mNWA lists the concerns of several stakeholders on restricting navigation within the mNWA. The Province of BC and local and regional governments (Port Hardy District Municipality and the Regional District of Mount Waddington) raised concerns about the possible effects of the mNWA on current and future marine transportation through the area.[153] The commercial shipping sector was supportive of Scott Islands mNWA because shipping activity was expected to continue as before.[154]

149 2018 RIAS, *supra* note 7, 2200-01.

150 Alexander J., Ford, J., Serdynska, A. and T. Koropatnick. 2014. Ecological Risk Assessment of the St. Anns Bank Area of Interest. Canadian Technical Report of Fisheries and Aquatic Sciences pp 3047.

151 Boutillier, J. 2016. Characterization and Analysis of Fisheries Related Risks to Significant Species, Habitats and Ecosystem/Community Properties within the Proposed Scott Islands marine National Wildlife Area. DFO Canadian Science Advisory Secretariat Research Document. 2016/015. viii + 71 pp.

152 DFO. 2015. Characterization of Fishery Effects on Significant Ecosystem Components of the proposed Scott Islands marine National Wildlife Area. *DFO Canadian Science Advisory Secretariat Science Advisory Report*. 2015/007.

153 Scott Islands Protected Marine Area Regulations, Regulatory Impact Analysis Statement, (2016) Canada Gazette I, 4340 [2016 RIAS].

154 Ibid., 4338.

DEVELOPMENT AND IMPLEMENTATION OF MEASURES TO ADDRESS SHIPPING

Several measures to address commercial shipping were proposed during the development of the Scott Islands mNWA (see Box 3, below). Some of these were eventually included in the Regulations, including the prohibition on anchoring large vessels within 1 nautical mile of Triangle, Sartine and Beresford Islands.[155] However, several measures that were proposed have not, on public record, been acted upon.

For example, the Regulatory Strategy and 2016 Regulatory Impact Analysis Statement refer to the publication of NOTMAR to advise vessels transiting the mNWA about the importance of the area for seabirds, its sensitivity to pollution and enhanced surveillance.[156] In the two years since the designation of Scott Islands mNWA, this measure has not yet been implemented.

In January of 2010, a NOTMAR was posted that advised mariners of the significant amounts of bird life using the areas surrounding the Scott Islands during certain times of the year and advised "extra caution to avoid any activities within this area that would be harmful or detrimental to migratory birds, their prey species, or other wildlife. These activities include, but are not limited to, unnecessary use of lights or other devices that may attract or disorient birds."[157] It also stated that "the discharge of oil, oily wastes, or other deleterious substances are subject to prosecution pursuant to Regulations under the CSA, the *Migratory Bird Convention Act (1994)*, and other legislations." Though this notice has not been updated since then, an update to the NOTMAR is currently in development.[158]

The regulatory strategy also recommended that CWS undertake an assessment of the need to enhance protection of seabirds and the marine ecosystem including through the designation of special areas or Particularly Sensitive Sea Areas under the IMO. There is currently no information on the public record on whether CWS has pursued this recommendation.

155 So tt Is ands Protec ed Marine Area Regulations, s pra note14 at s 2(1)(f); Env ronment Canada. 2013. Regulatory Strategy for the Des gnation of the Propo e d So tt Is ands marine National Wildlife Area

156 Env ronment Canada. 2013. Regulatory Strategy for the Des gnation of the Propo e d So tt Is ands marine National Wildlife Area; 2016 RIAS, s pra note 154, 4338.

157 DFO. 2020. Noti e to Mariners 35(1), a nuary 29, 2010. Online: notmar.gc a /arb i e -en.php?page=we 1e10

158 Eri a Lo k Canada Wildlife Serv e . 2020. Pers nal Communi a tion.

Box 3. Scott Islands mNWA Regulatory Strategy: Additional recommended measures specific to the NWA.

- Publication of NOTMAR to advise vessels transiting the NWA about the importance of the area for seabirds, its sensitivity to pollution, and enhanced surveillance therein.
- Increased support for the Marine Aerial Reconnaissance Team and ECCC's Integrated Satellite Tracking of Pollution Program for surveillance and enforcement of regulations, in particular for the discharge of oil or oily waste.
- A prohibition on the anchoring of vessels greater than 400 gross tonnage within a 1NM radius of Triangle, Sartine and Beresford Islands, except where specifically authorized for fishing, safety or research, and when consistent with the emergency measures in the regulatory strategy.
- Assess the need to enhance protection of seabirds and the marine ecosystem, where and when required, through the designation of special areas or particularly sensitive sea areas under the IMO.
- Continued support for the Birds Oiled at Sea Program, led by ECCC, which develops science to support effective management of risks from oil on seabirds

Emergency measures:

- Safe anchorage for fishing and coastal tug and barge traffic where there is no risk of release of fuel or other contaminants will be authorized.
- The mNWA will not be considered by TC as a pre-designated place of refuge where a ship in need of assistance can stabilize its condition.
- ECCC will be consulted for advice on handling of distressed ships near or within the mNWA, as soon as possible without creating hazardous delays.
- Any disabled vessels that are leaking fuel, other contaminants or cargo, or are on fire, will be towed via the least environmentally harmful route, to a designated place of refuge to undertake repairs.
- In an effort to protect the shoreline and coastal waters from a potential risk of pollution the Tanker Exclusion Zone will continue to apply in the mNWA.
- Future strategies for management of shipping incidents will consider the availability of seagoing tugs able to handle large ships.
- ECCC's capacity to participate in programs for response to catastrophic spills will be improved.

In addition, several of the goals outlined in the Regulatory Strategy for the mNWA (See Box 1) appear to require some regulatory consideration of vessel impacts. CWS is currently developing a Management Plan for Scott Islands mNWA in consultation with management partners and the advisory committee. As part of this process, CWS has recognized the need for an updated risk analysis and assessment of shipping activities, including interactions with wildlife.[159] For example, Goal 1A states that "Marine habitats and ecosystem functions important for seabird foraging are protected from harmful disturbance, damage or destruction." The impacts of vessel traffic on seabirds at sea were not considered as part of the risk assessment for the management of activities in the mNWA and do not appear to have been addressed in the Scott Islands Regulations.

Goal 2B states that "Proactive measures are in place to ensure effective response to catastrophic and chronic spills of oil or any other hazardous materials." The Regulatory Strategy proposed several measures related to oil spills (Box 3), which could be implemented through the management plan to help mitigate the risk of an oil spill occurring.

159 Erika Lok, Canada Wildlife Service. 2020. Personal Communication.

RECOMMENDATION #5:

Proactively regulate shipping activities. The *Scott Islands Protected Marine Area Regulations* include a blanket exception for shipping and navigation within the area, which has been the traditional approach in MPA development in Canada. However, given increasing scientific findings on the impacts of shipping as well as the projected increase in vessel traffic in the future, a more proactive and precautionary risk-based approach is needed. New, more proactive approaches are being pursued in certain MPAs, including vessel traffic restrictions in NWAs in Nunavut, the prohibition on greywater discharge in Banc-des-Américains MPA, and increased monitoring and prohibitions on ballast water exchange surrounding SGaan Kinghlas-Bowie Seamount MPA.

RECOMMENDATION #6:

Improve interdepartmental coordination with Transport Canada (TC). While NWAs are developed and managed by Canadian Wildlife Service (CWS)-ECCC, Fisheries and Oceans Canada (DFO) retains its management authority over fishing, and TC retains its authority over navigation. The development of the Scott Islands mNWA demonstrates extensive coordination between CWS-ECCC and DFO, including in the development of an ecological risk-based analysis on the impacts of commercial fishing. As navigation was identified as one of the other primary threats to marine biodiversity within the mNWA, the same level of engagement and collaboration is needed with TC.

CONSIDERATION OF SPECIES AT RISK

As noted earlier in "The Scott Islands marine National Wildlife Area" section, several at-risk species use the marine habitat of the Scott Islands mNWA, and the designation of the mNWA was noted as a "conservation action" within the species' management plans prepared by DFO.

Some of the primary threats to the Steller sea lion (listed under SARA as "special concern") include oil spills during the breeding season, as well as chronic noise and disturbances around sea lion rookeries and foraging sites, all of which can cause animals to abandon rookeries and disrupt foraging behaviours, significantly impacting pups at these rookeries. The Management Plan for the Steller Sea Lion states that the Scott Islands mNWA will serve to protect the habitat for several nationally listed species at risk, including Steller sea lions.[160] Thus, fulfilling the goals of the various SARA management plans includes adequately addressing the risks for this population and protection of identified key habitat areas which include the Scott Islands mNWA.

Similarly, the Management Plan for the Sea Otter also notes that the designation of the Scott Islands mNWA may provide further management and protection for sea otter habitat, given that threats to this population (including environmental contaminants such as oil spill; vessel strikes; and human disturbance).[161]

Finally, the Species at Risk Management Plan for the Black-Footed Albatross also includes the designation of the Scott Islands mNWA as an "important tool" for that species' conservation, specifically from threats of bycatch mortality from longline fishing activities.[162]

Goal 3D of the Scott Islands Regulatory Strategy is to, "in collaboration with other responsible authorities, support the implementation of recovery

160 Fisheries and Oceans Canada. 2010. Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada [Final]. Species at Risk Act Management Plan Series Fisheries and Oceans Canada, Ottawa. iv + 69 pp.

161 Fisheries and Oceans Canada. 2014. Management Plan for the Sea Otter (Enhydra lutris) in Canada. Species at Risk Act Management Plan Series Fisheries and Oceans Canada, Ottawa. iv + 50 pp.

162 Environment and Climate Change Canada. 2017. Management Plan for the Black-Footed Albatross (Phoebastria nigripes) in Canada. Species at Risk Act Management Plan Series Environment and Climate Change Canada. Ottawa. iv + 30 pp.

strategies, action plans and management plans for species listed under Schedule 1 of the Species at Risk Act." The Scott Islands 2018 Regulatory Impact Analysis Statement also states that "[c]oordinated consideration of species at risk within the PMA will occur through the management planning process."[163] As discussed above, several marine species listed under SARA include the designation of the Scott Islands mNWA within their management plans.

Additionally, many other listed species are known to occur within the marine habitat of the mNWA. Risks listed for these species within their management plans include ship strike and oil pollution. However, without an assessment that specifically examines the risks posed to the ecological conservation priorities within the mNWA by vessels, it is difficult to assess whether goals for implementing actions for these at-risk species will support their recovery strategies.

RECOMMENDATION #7:

Increase consideration of shipping impacts on species at risk. One of the objectives of the Scott Islands mNWA is the conservation of species at risk and their habitats. The management plans of several at-risk species rely on Scott Islands mNWA as a protective measure. However, much of the development of the mNWA focused on migratory seabirds, and threats to species at risk do not appear to have been adequately considered or addressed. In particular, the impacts caused by shipping activities to species at risk have not been considered within the mNWA. Fulfilling the goals of the Scott Islands mNWA and the species at risk management plans requires adequately addressing the risks for this population caused by shipping activities within the mNWA.

Integration with other marine initiatives

As awareness of the risks arising from vessel transit continues to grow, commercial shipping activities will begin to face the same level of attention as other industries such as commercial fishing. New marine spatial planning initiatives on the Pacific Coast are one example of this growing awareness, as are recent Oceans Protection Plan (OPP) initiatives.[164] These initiatives should be coordinated with initiatives that address the impacts of shipping within the Scott Islands mNWA and other MPAs.

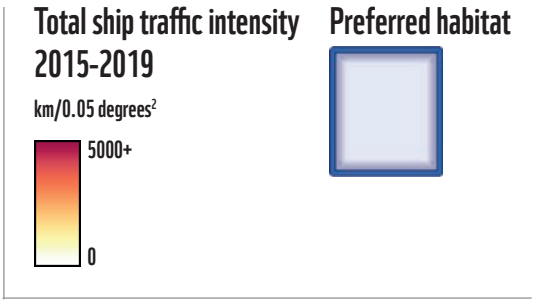
RECOMMENDATION #8:

Integrate the management of Scott Islands mNWA into wider vessel management. Improved management of shipping in the mNWA should be coordinated with other marine spatial planning initiatives and with activities under the Oceans Protection Plan (OPP). These initiatives present an opportunity to implement management of vessel impacts within a larger marine spatial planning and regulation framework.

163 2018 RIAS, supra note 7, 2222.

164 See for example Fisheries and Oceans Canada's Departmental Plan 2019-20, online: waves-vagues.dfo-mpo.gc.ca/Library/40776542.pdf; Transport Canada. 2020. Oceans Protection Plan. Online: tc.canada.ca/en/initiatives/oceans-protection-plan

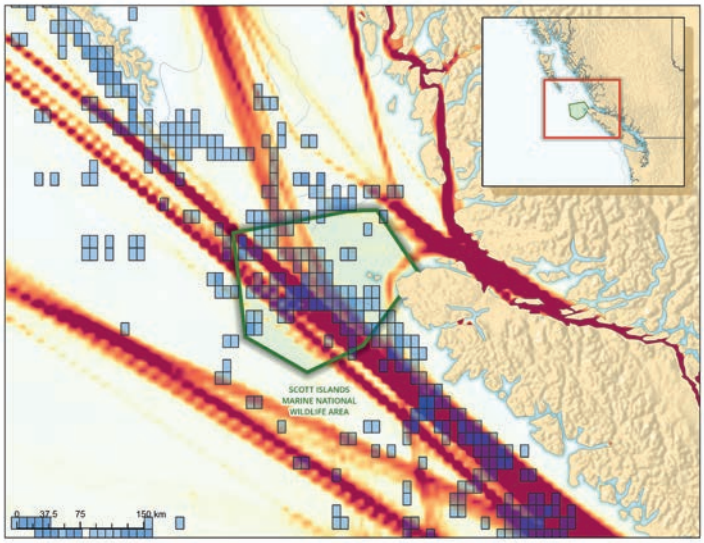
APPENDIX A: PREFERRED HABITAT OF SELECT PELAGIC SEABIRDS



Preferred habitat, relative to the Scott Islands marine National Wildlife Area, for select pelagic seabird species. Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.[165]

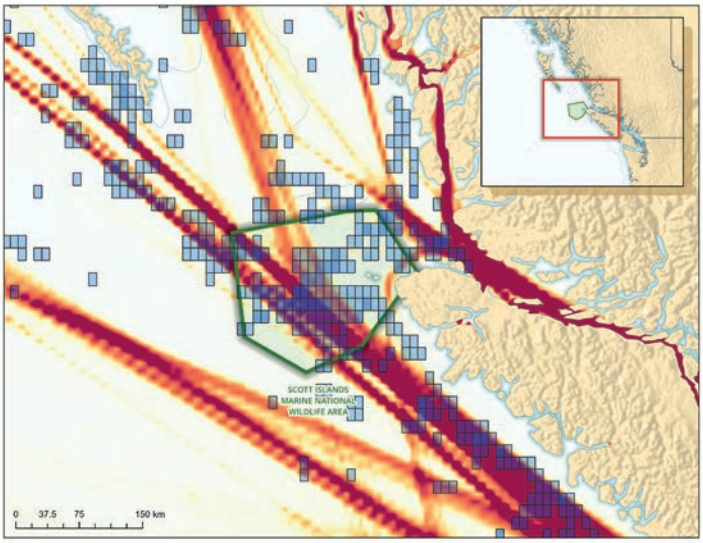
Preferred habitat: Black-footed albatross

Map displaying the preferred habitat for the black-footed albatross (Phoebastria nigripes) relative to the Scott Islands marine National Wildlife Area.[166] Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.



Preferred habitat: Cassin's auklet

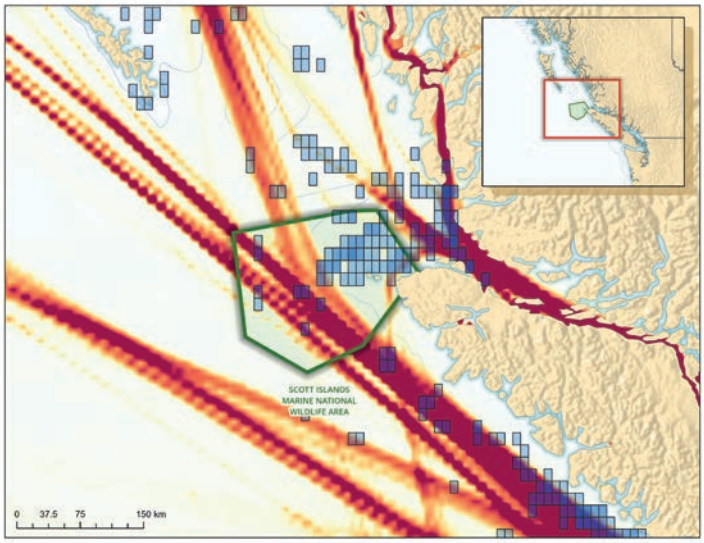
Map displaying the preferred habitat for Cassin's auklet (Ptychoramphus aleuticus) relative to the Scott Islands marine National Wildlife Area.[167] Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.



165 Canadian Wildlife Service. 2016. Atlas of Pelagic Seabirds off the West Coast of Canada and Adjacent Areas [Shapefile]. Environment Canada.
166 CWS, 2016
167 Ibid

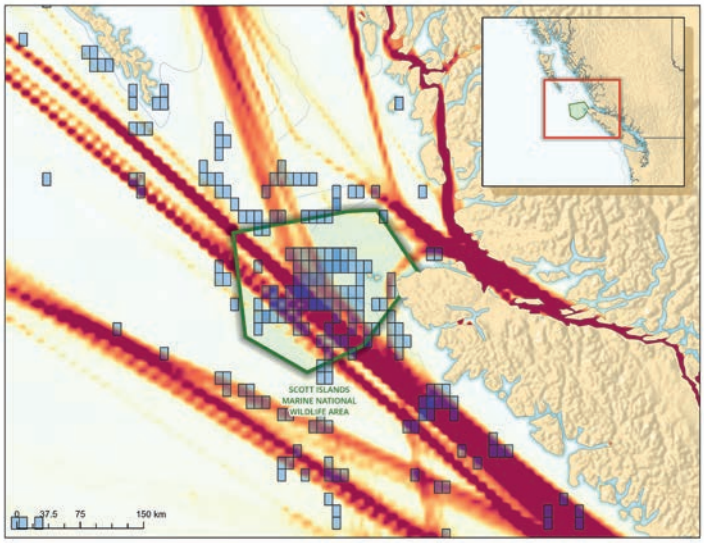
Preferred habitat: Common murre

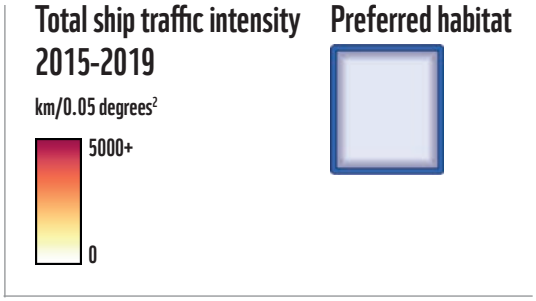
Map displaying the preferred habitat for the common murre (Uria aalge) relative to the Scott Islands marine National Wildlife Area.[168] Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.



Preferred habitat: Tufted puffin

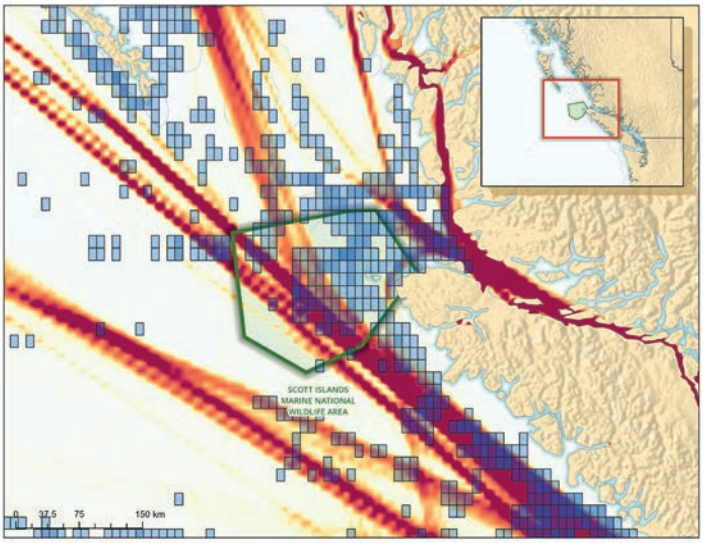
Map displaying the preferred habitat for the tufted puffin (Fratercula cirrhata) relative to the Scott Islands marine National Wildlife Area.[169] Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.





Preferred habitat: Sooty shearwater

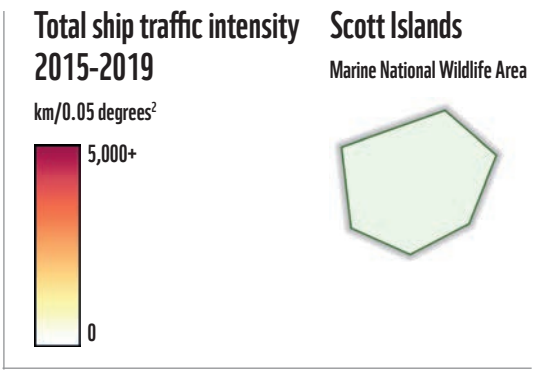
Map displaying the preferred habitat for the sooty shearwater (Ardenna grisea) relative to the Scott Islands marine National Wildlife Area.[170] Preferred habitat is represented as grid cells in the 90th percentile of seasonal sightings contained in the west-coast pelagic seabird atlas.



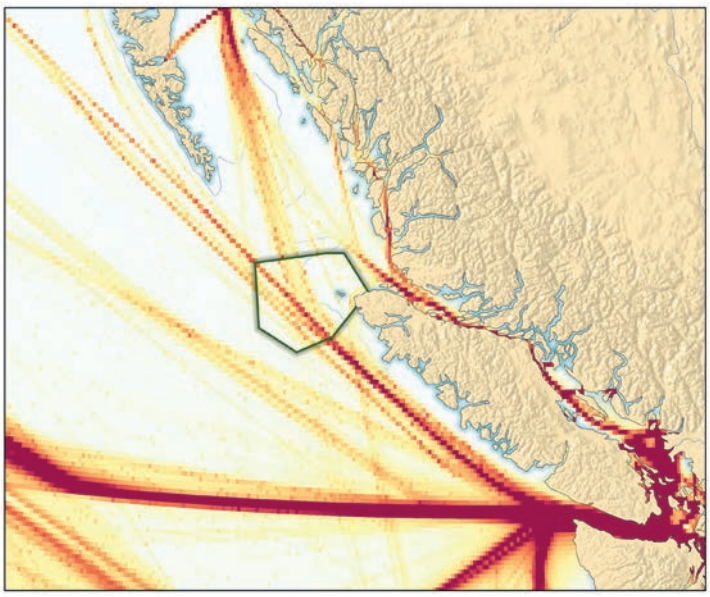
168 Ibid
169 Ibid
170 Ibid

APPENDIX B: VESSEL TRAFFIC INTENSITY BY SHIP TYPE

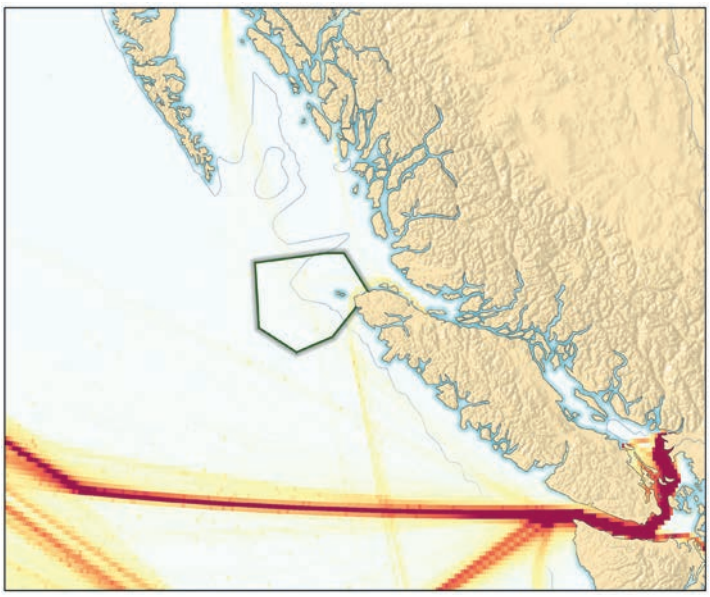
Maps displaying cumulative 2015-2019 ship traffic intensity for the region surrounding Scott Islands represented by total distance traveled in kilometers per 0.5 degrees^2. Distance was derived from AIS point locations across all available ship types. Ship types with nominal activity within the region were omitted.



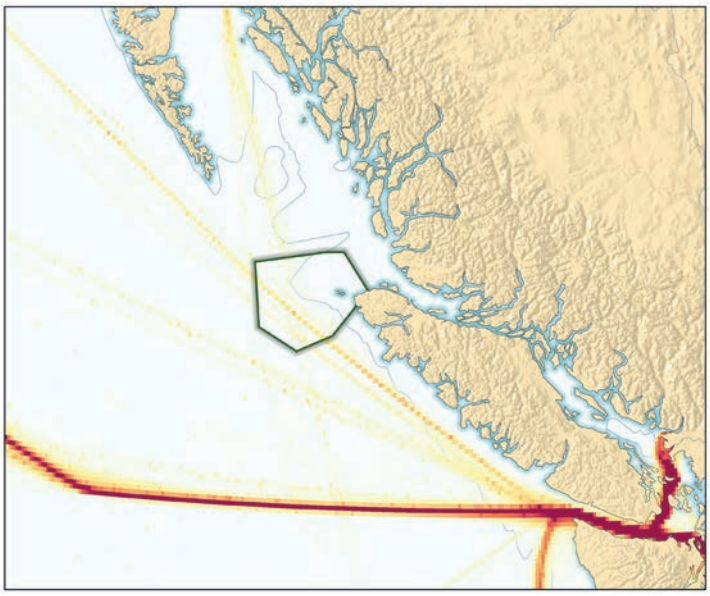
Total ship traffic intensity: All ship types



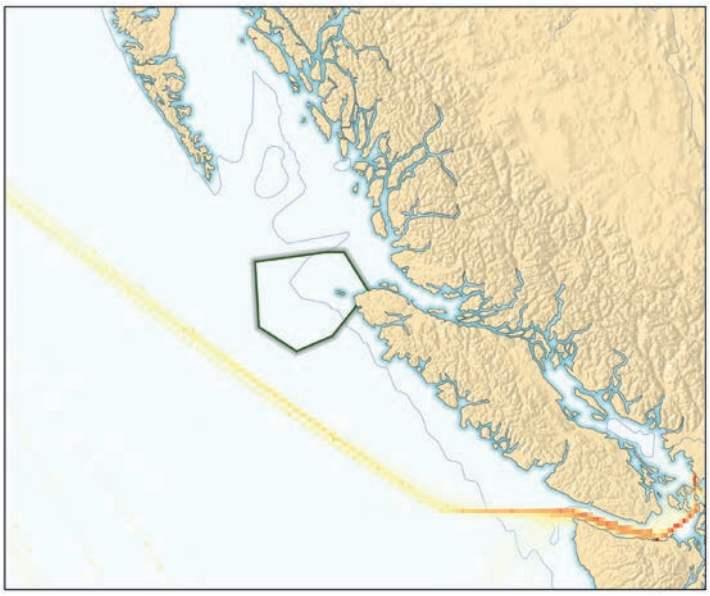
Total ship traffic intensity: Bulk carriers

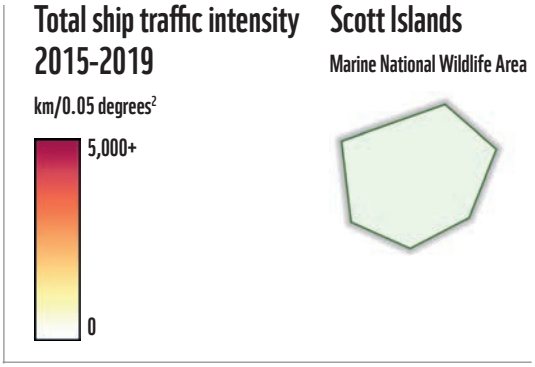


Total ship traffic intensity: Container ships

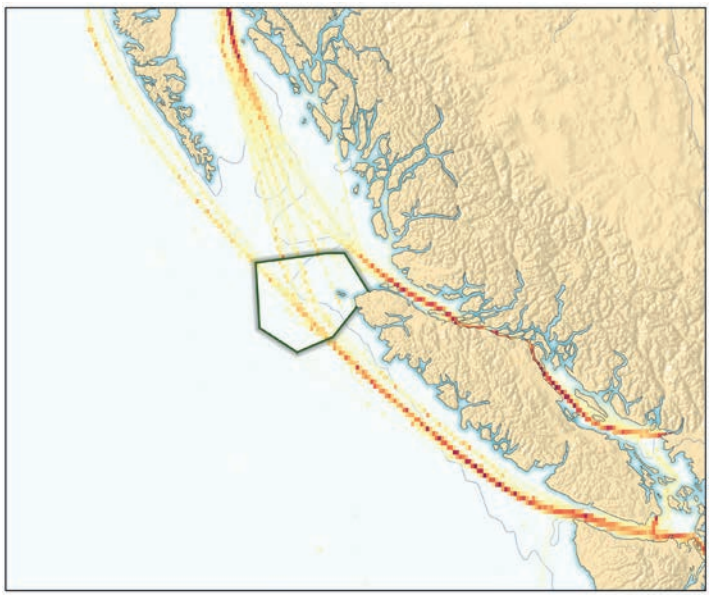


Total ship traffic intensity: Crude oil tankers



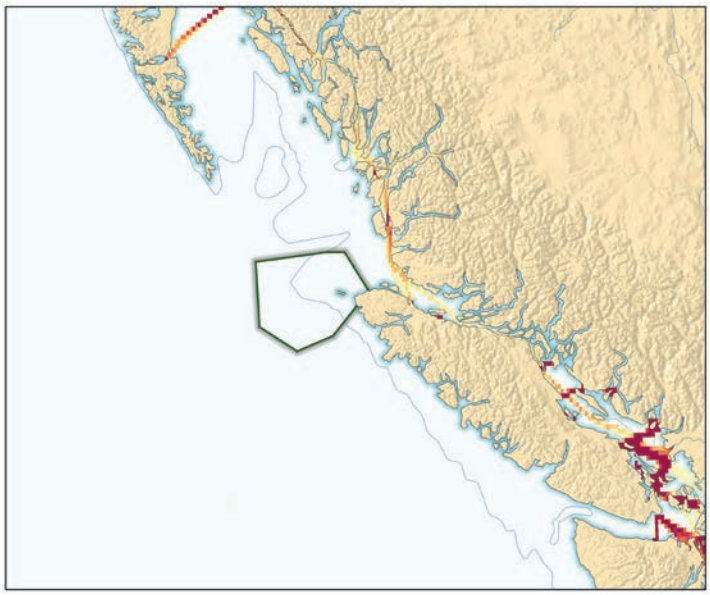


Total ship traffic intensity: Cruise ships

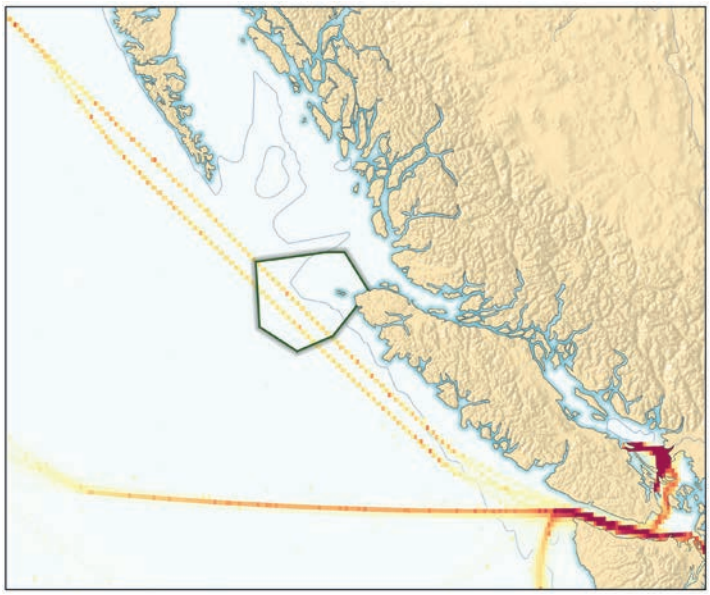


Total ship traffic intensity: General cargo ships

Total ship traffic intensity: Passenger ships

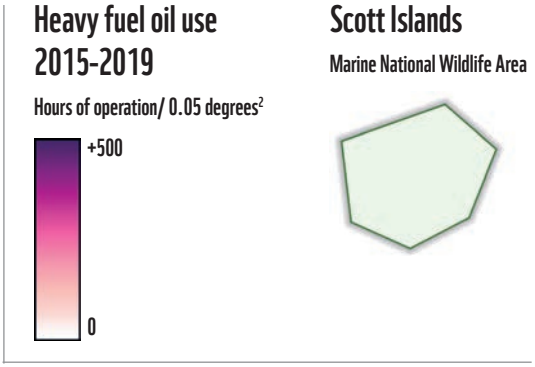


Total ship traffic intensity: Roro cargo ships

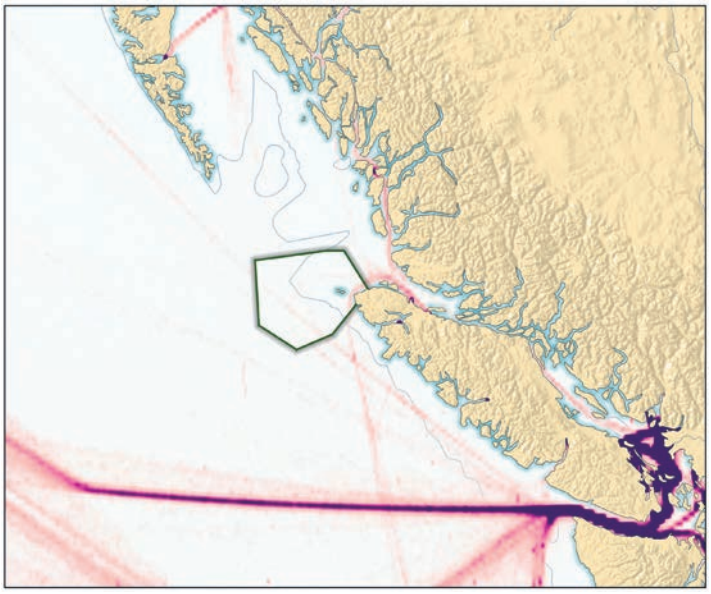


APPENDIX C: HEAVY FUEL OIL USE BY SHIP TYPE

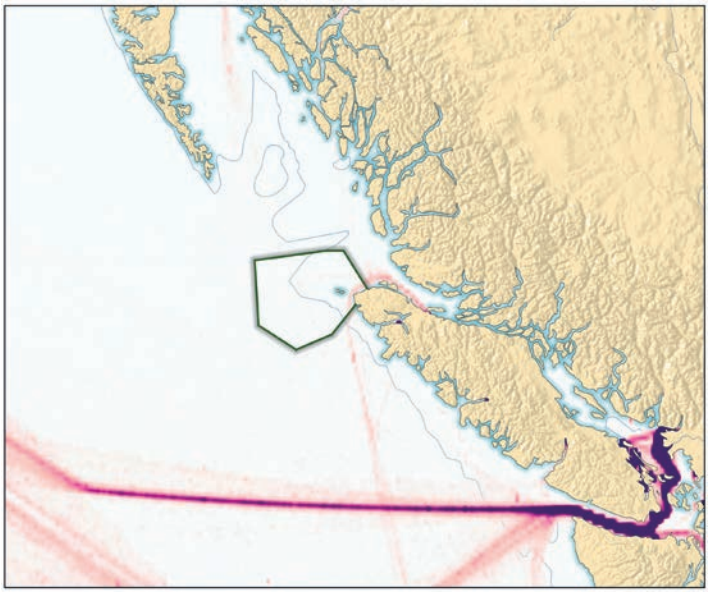
Maps display cumulative 2015-2019 ship heavy fuel use for the region surrounding Scott Islands as represented by total hours of operation per 0.5 degrees^2. Time spent by residual fuel oil using ships was derived from AIS point locations across all available ship types. Ship types with nominal activity within the region were omitted.



Total heavy fuel oil use by ship type: All ship types

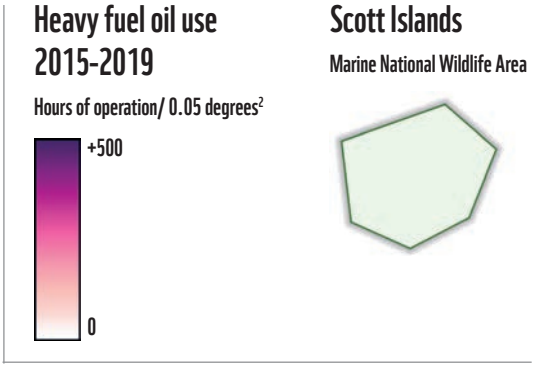


Total heavy fuel oil use by ship type: Bulk carriers



Total heavy fuel oil use by ship type: Container ships

Total heavy fuel oil use by ship type: Crude oil tankers



Total heavy fuel oil use by ship type: Cruise ships

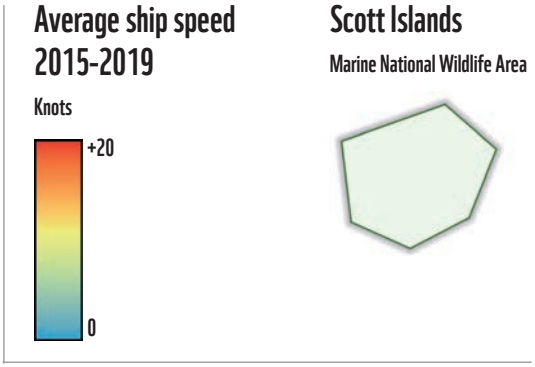
Total heavy fuel oil use by ship type: General cargo ships

Total heavy fuel oil use by ship type: Passenger ships

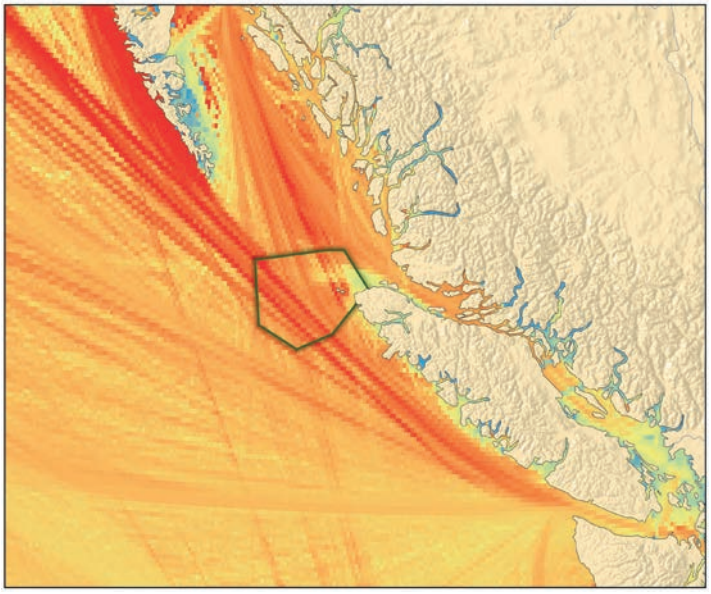
Total heavy fuel oil use by ship type: Roro cargo ships

APPENDIX D: AVERAGE SHIP SPEED BY SHIP TYPE

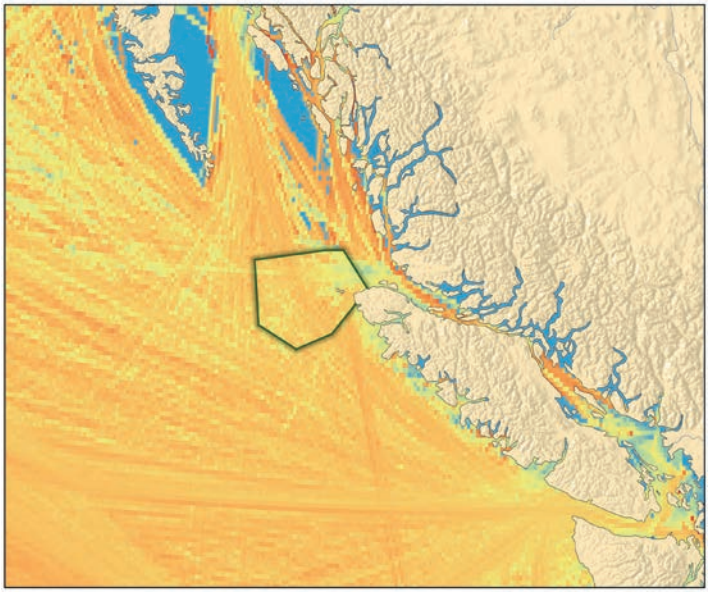
Maps displaying average 2015-2019 ship speeds for the region surrounding Scott Islands in knots. Average speeds were derived from AIS point locations across all available ship types on a per-pixel basis. Ship types with nominal activity within the region were omitted.



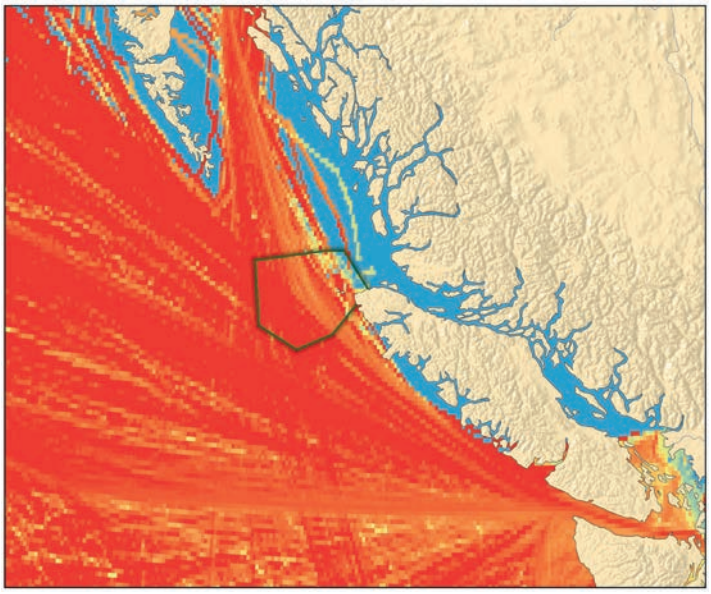
Average ship speeds: All ship types



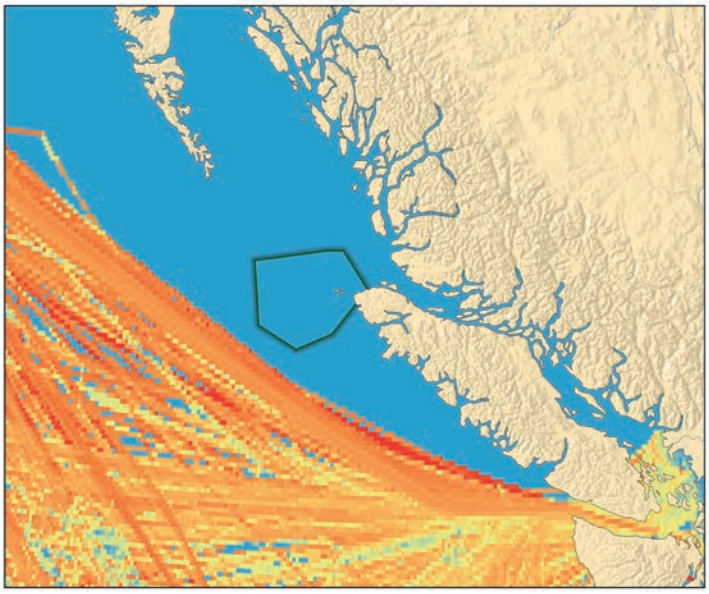
Average ship speeds: Bulk carriers

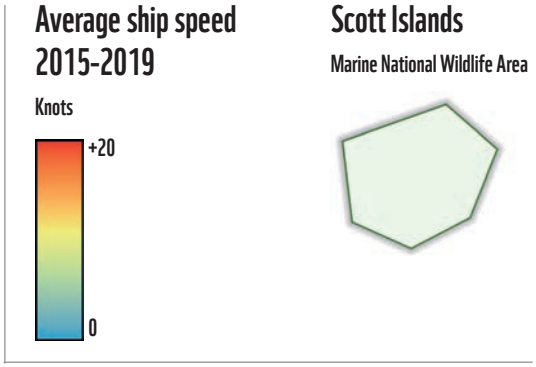


Average ship speeds: Container ships

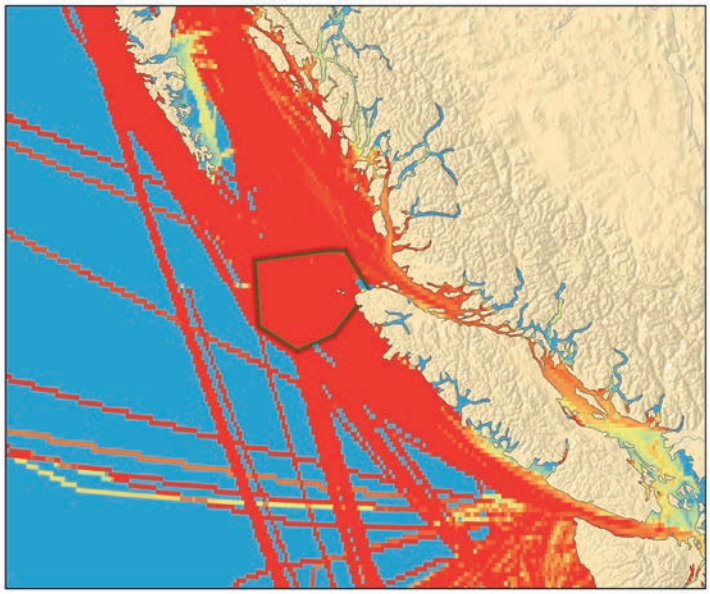


Average ship speeds: Crude oil tankers

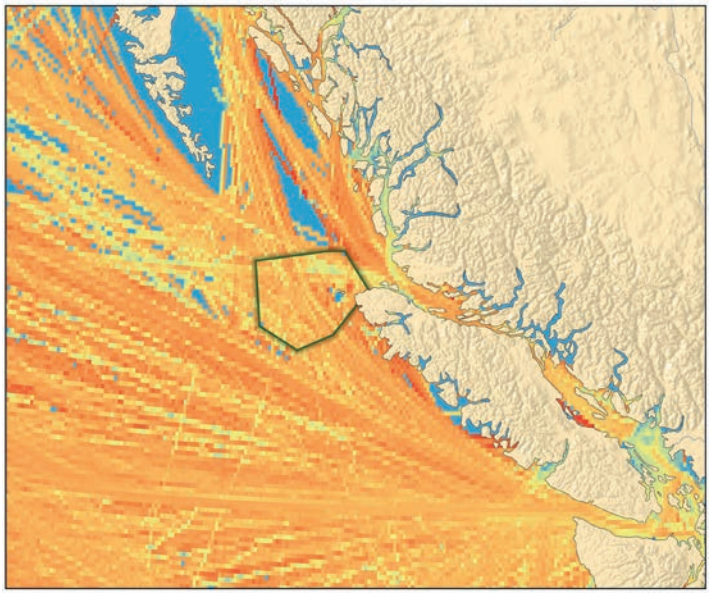




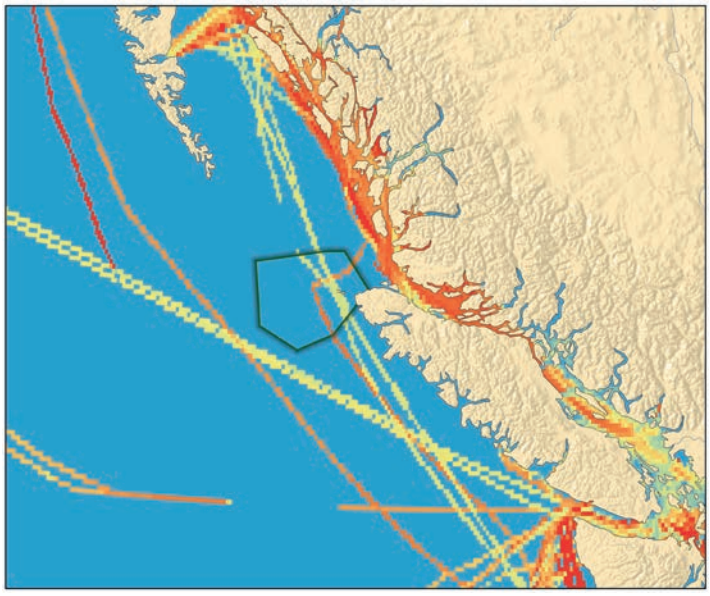
Average ship speeds: Cruise ships



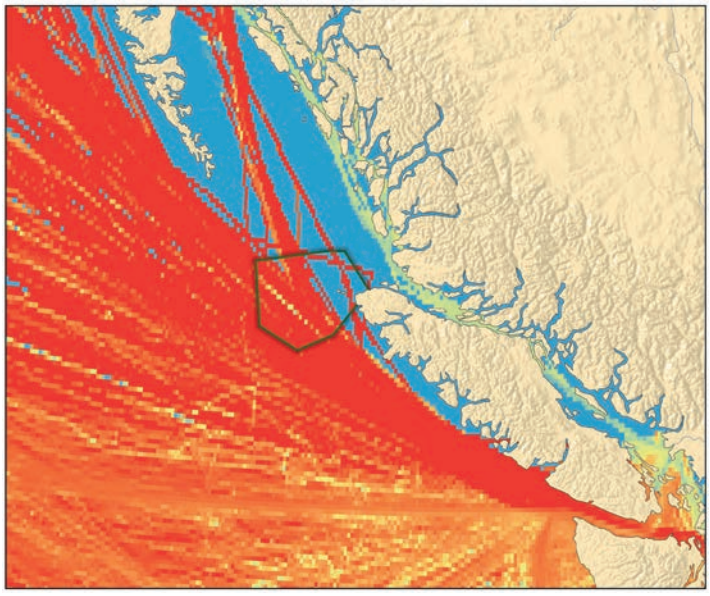
Average ship speeds: General cargo ships



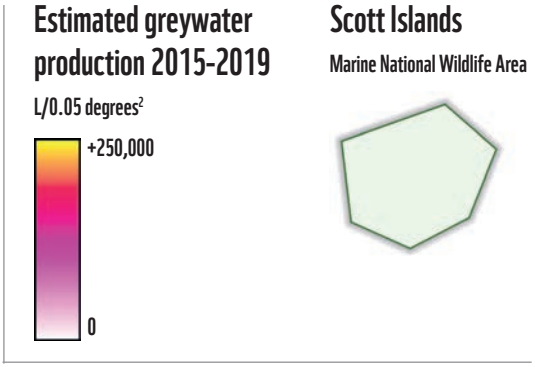
Average ship speeds: Passenger ships



Average ship speeds: Roro cargo ships

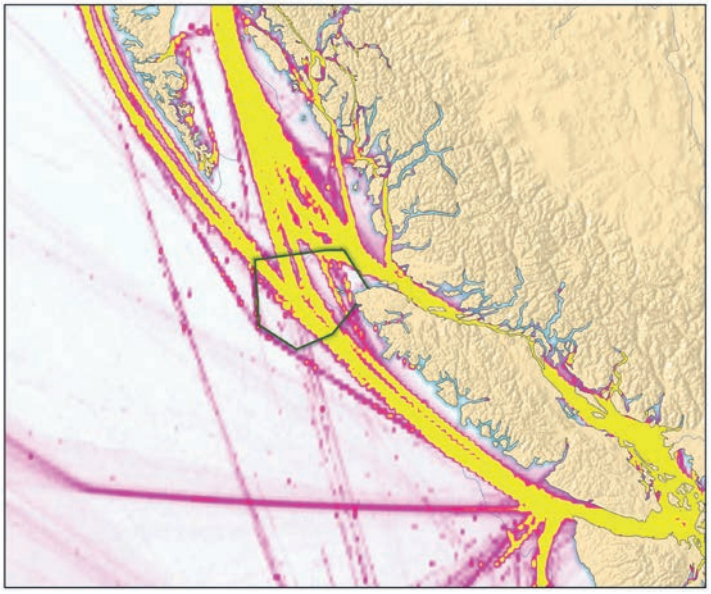


APPENDIX E: ESTIMATED GREYWATER PRODUCTION BY SHIP TYPE

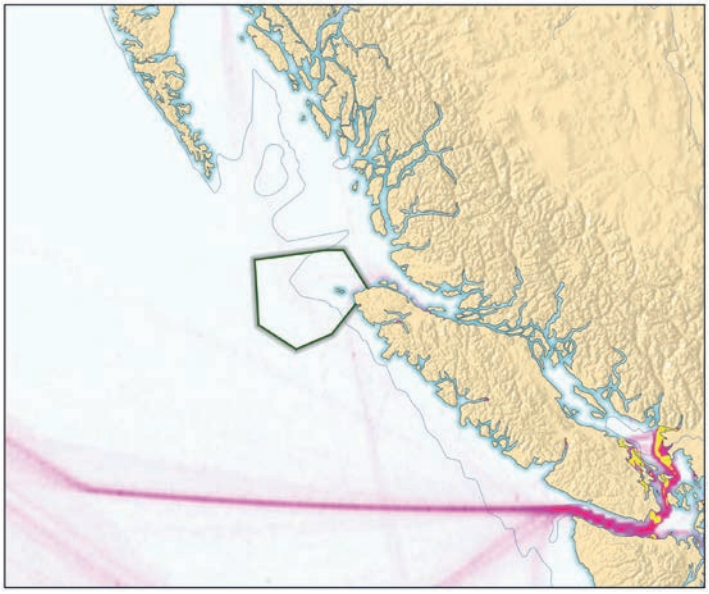


Maps displaying cumulative 2015-2019 ship greywater generation for the region surrounding Scott Islands as represented by total litres per 0.5 degrees^2. Estimates were derived from AIS point locations across all available ship types in combination with coefficients of greywater production (Vard, 2019). Ship types with nominal activity within the region were omitted.

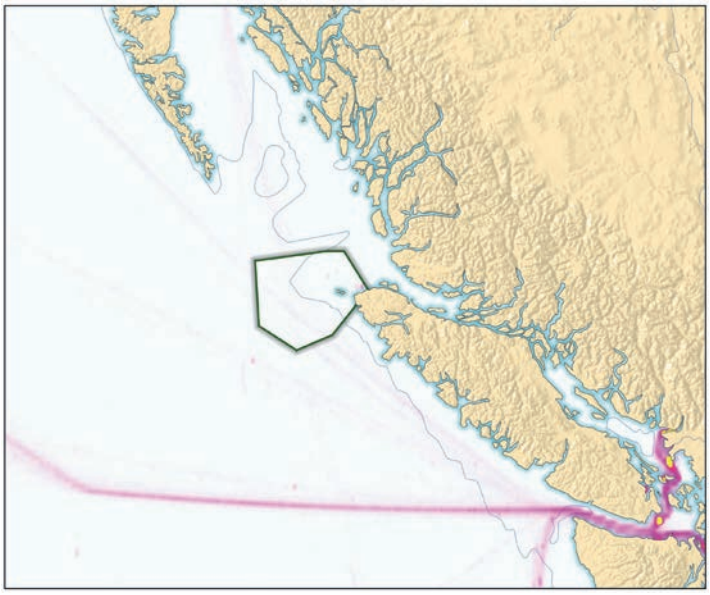
Estimated ship-based greywater production: All ship types



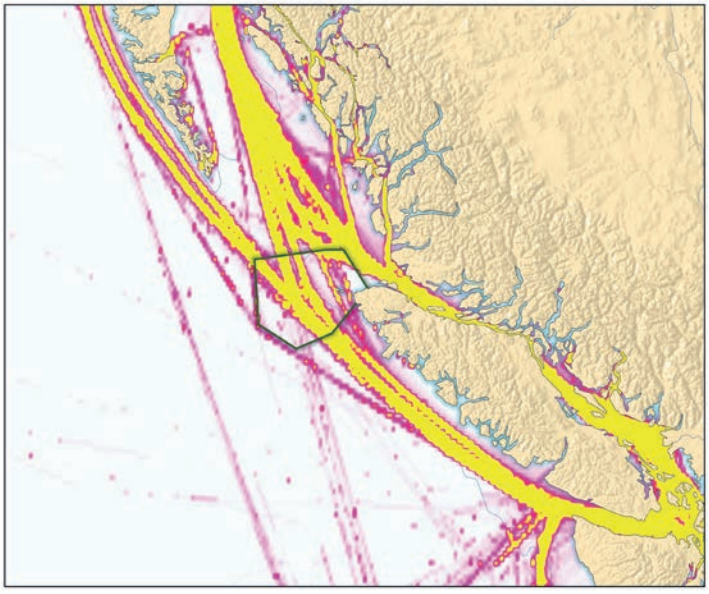
Estimated ship-based greywater production: Bulk carriers



Estimated ship-based greywater production: Container ships



Estimated ship-based greywater production: Cruise ships



Estimated greywater production 2015-2019

L/0.05 degrees^2

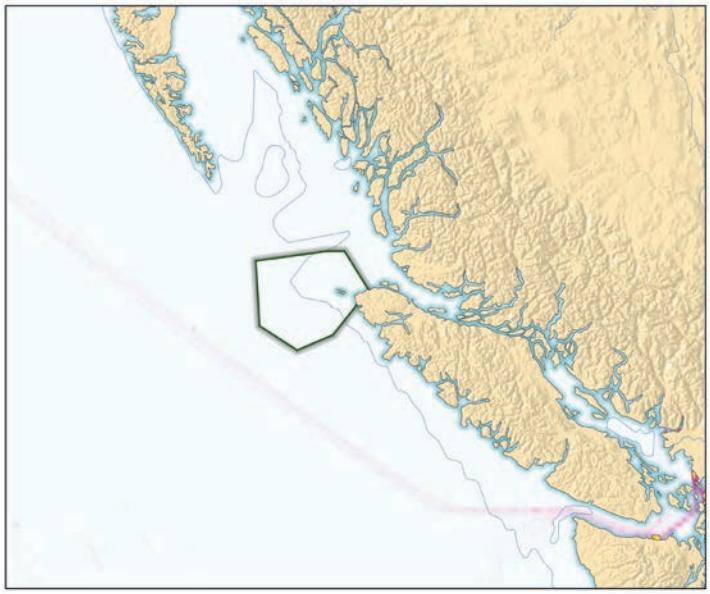
+250,000

0

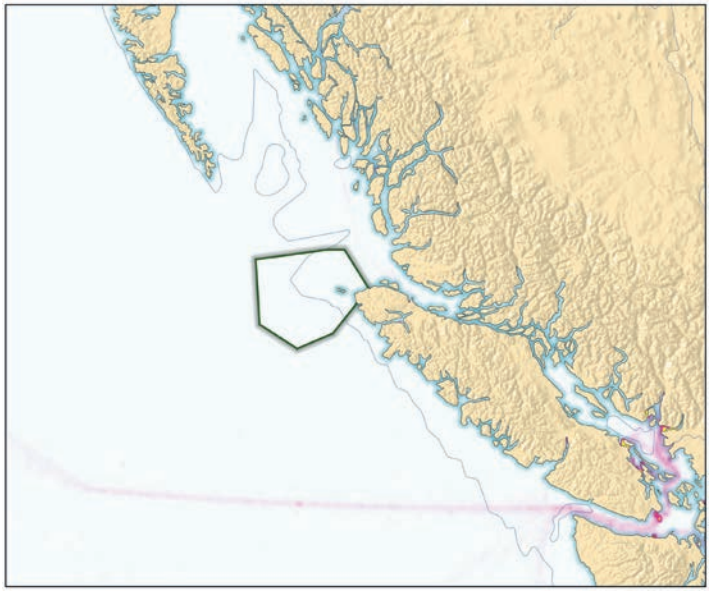
Scott Islands

Marine National Wildlife Area

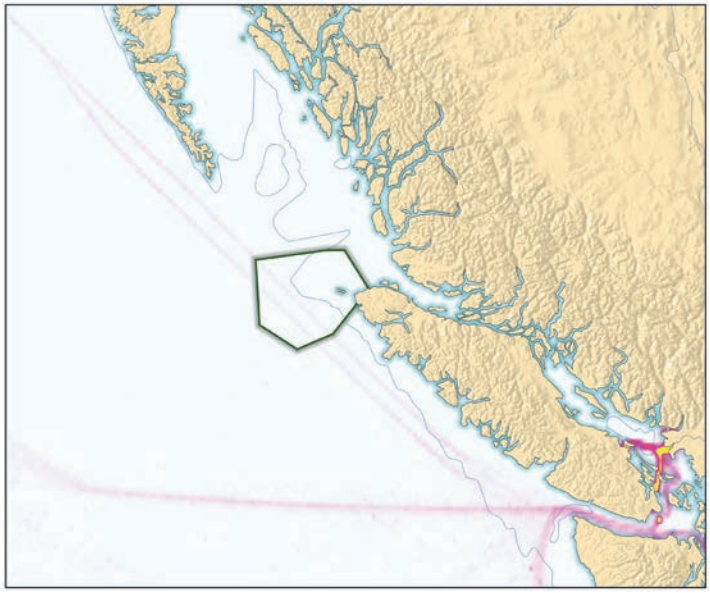
Estimated ship-based greywater production: Crude oil tankers



Estimated ship-based greywater production: General cargo ships



Estimated ship-based greywater production: Roro cargo ships



Estimated greywater production 2015-2019

L/0.05 degrees^2

+250,000

0

Scott Islands

Marine National Wildlife Area

GLOSSARY OF TERMS

BC	British Columbia
CGI	Canada Gazette Part I
CSA	*Canada Shipping Act*
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
ECCC	Environmental and Climate Change Canada
ECHO	Enhancing Cetacean Habitat and Observation Program
EEZ	Exclusive Economic Zone
IMO	International Maritime Organization
IUCN	International Union for Conservation of Nature
mNWA	marine National Wildlife Area
MPA	Marine protected area
NARW	North Atlantic right whale
NM	Nautical miles
NOTMAR	Notice to Mariners
NWA	National Wildlife Area
OPP	Oceans Protection Plan
PNCIMA	Pacific North Coast Integrated Management Area
SARA	*Species at Risk Act*
SRKW	Southern resident killer whale
TC	Transport Canada

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