HIBERNIA MANAGEMENT AND DEVELOPMENT COMPANY

2D/3D/4D SEISMIC PROJECTS (2013-LIFE OF FIELD) NEWFOUNDLAND OFFSHORE AREA

2024 ENVIRONMENTAL ASSESSMENT UPDATE

MAY 2024



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2024 ENVIRONMENTAL ASSESSMENT UPDATE

HIBERNIA MANAGEMENT AND DEVELOPMENT COMPANY
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ABBREVIATIONS

Term	Definition
2D	2-dimensional
3D	3-dimensional
4D	4-dimensional
AGC	Atlantic Groundfish Council
ASP	Association of Seafood Producers
CE	Critically Endangered
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
E	Endangered
EA	Environmental Assessment
ECCC-CWS	Environment and Climate Change Canada-Canadian Wildlife Service
ESRF	Environmental Studies Research Fund
FFAW-Unifor	Fish Food and Allied Workers Union
FLO	Fisheries Liaison Officer
GBS	Gravity Based Structures
GGEG	Geophysical, Geological, Environmental and Geotechnical
HMDC	Hibernia Management and Development Company Ltd.
LC	Least Concern
LOF	Life-of-Field
M2	Monitor 2
NL ESA	Newfoundland and Labrador *Endangered Species Act*
NT	Near Threatened
OCI	Ocean Choice International
SAR	Species at risk
SARA	*Species at Risk Act*
SC	Special Concern
SiBA	Significant Benthic Areas
SOCP	Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment
T	Threatened
V	Vulnerable

1 INTRODUCTION

The Hibernia Management and Development Company Ltd. (HMDC) is planning on conducting a 4D seismic program in the Hibernia field off the coast of Newfoundland and Labrador in 2024. The Hibernia oil field is located offshore Newfoundland and Labrador, Canada in the Jeanne d'Arc Basin which underlies the northwestern portion of the Grand Banks, approximately 315 kilometres east-southeast of St. John's. The planned program will consist of monitor seismic surveys which will allow HMDC to continue to improve the understanding of hydrocarbon movements beneath the Hibernia field. The data collected from this survey will be used to improve life of field and inform drilling and production decisions.

This document provides an environmental assessment (EA) update that outlines proposed activities, assess EA predictions for the proposed activities, and provides updates on baseline environmental components.

1.1 ENVIRONMENTAL ASSESSMENT SUMMARY

The HMDC seismic survey program was subject to an environmental assessment from 2013-2015 (LGL Limited 2015b) pursuant to the requirements of the EA review processes in place at that time. A series of EA addenda and documents were submitted that detailed HMDC's response to regulator comments and to changes in the Project Description. In 2015, the proponent provided a revision to the original EA that was an administrative consolidation of the EAs and addenda (LGL Limited 2015b, C-NLOPB 2015a). The Canada-Newfoundland Offshore Petroleum Board (C-NLOPB) determined that "the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects." The Proponent subsequently prepared and submitted an EA Update for the Project in 2015 (LGL Limited 2015a).

Table 1-1 Environmental Assessment Summary

Environmental Assessment Documents	EA (LGL Limited 2015b) (LGL 2013a) EA Addenda (LGL 2013b) EA Update (LGL Limited 2015a) Determination Report (C-NLOPB 2015)
Temporal Scope	May 1 to December 31 annual window during the 2013 to Life-of-Field period.
Geographic Scope	Figure 1-1. Detailed coordinates available in (LGL Limited 2015b)
Planned 2024 Project Activities	4D Seismic Survey Supply and Servicing

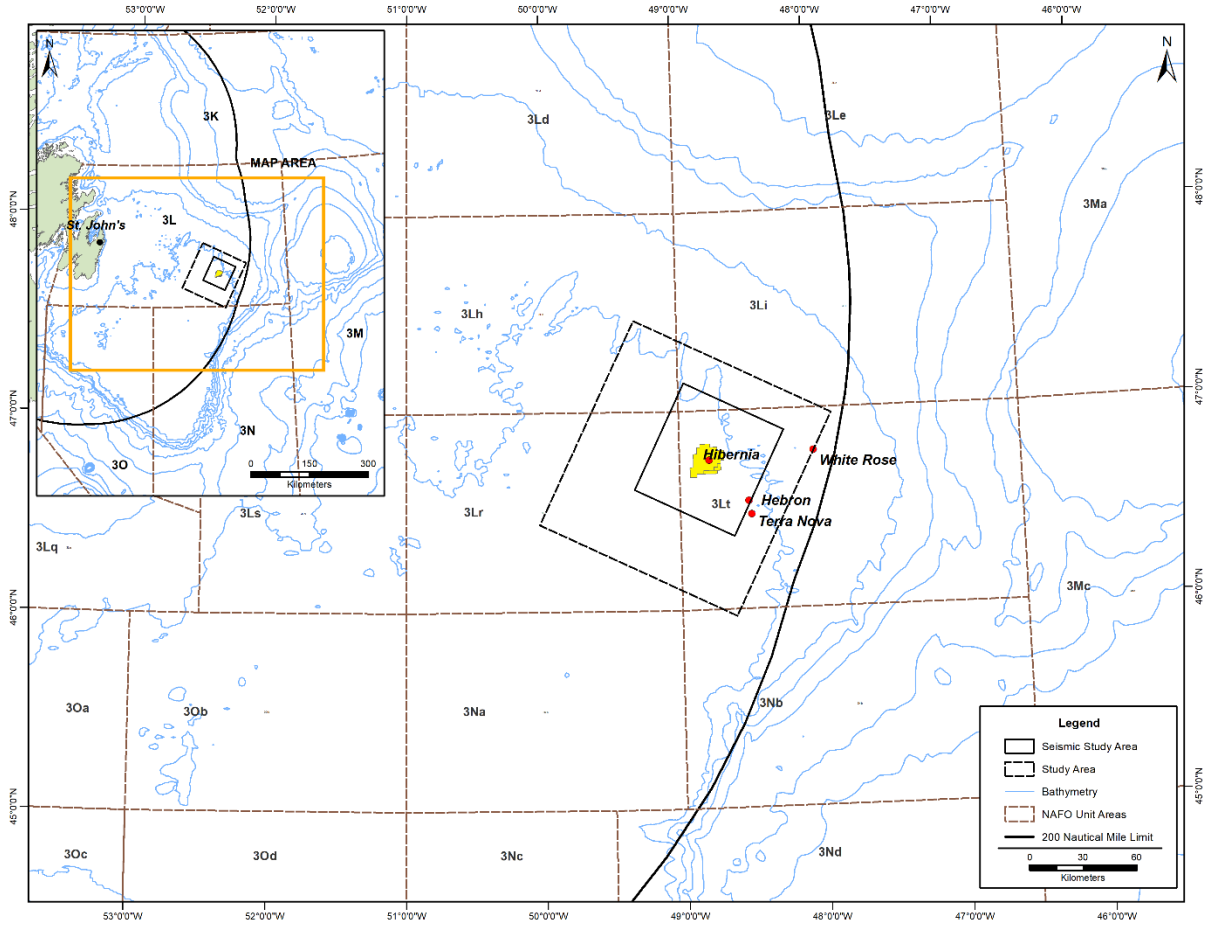


Figure 1-1 Project area showing the Study/Project Area and the LOF Seismic Survey Area

1.2 ENVIRONMENTAL ASSESSMENT UPDATE SCOPE

The C-NLOPB requires, at the time of application for subsequent program authorizations, that the operator provide information that outlines proposed activities, confirms that the proposed activities fall within the previously assessed program scope, indicates whether the EA predictions remain valid, and provides an update on species at risk (SAR) (C-NLOPB; Canada-Newfoundland and Labrador Offshore Petroleum Board 2015a). In support of these requirements, the EA update provides the following information:

- An overview of the planned Project activities for the 2024 monitor survey (Section 2.2);
- Information on consultation and engagement activities undertaken (Section 2.3);
- Updated applicable baseline information for key environmental components since the initial EA and associated updates were produced (Section 3), specifically, updated information regarding:
  - Species of conservation concern (Section 3.1);
  - Special areas (Section 3.2); and
  - Commercial fisheries (Section 3.3).
- Evaluation and confirmation that the nature and scope of the planned activities are within the scope of the approved EA (Section 4).

2 PROJECT DESCRIPTION

2.1 OVERVIEW OF THE ORIGINAL PROJECT DESCRIPTION

The Project, as evaluated under the EA, includes the planned conduct of geophysical programs (2D/3D/4D seismic) within an approximately 4,035 km² area that includes the Hibernia location. Survey activities may occur between the May 1 to December 31 annual window within the 2013 to Life-of-Field (LOF) timeframe. The project includes the implementation of a geophysical survey with a seismic vessel, a towed seismic air source(s) array, and a towed streamer(s) receiver array. The seismic vessel may be supported by a picket vessel and a logistics supply vessel. A secondary source vessel (i.e., an undershoot vessel with a towed seismic source) may be used. However, only one sound source at a time would be active if there are two source vessels present.

The typical survey source parameters for HMDC's 2D, 3D, or 4D survey included one or two air source arrays that have a total volume per source of 3,000-6,000 in³. The air source would be towed at a depth of 6 m and operate at a pressure of 2,000 psi. The air source would produce approximate peak to peak pressures of 120 bar-m. The towed air source depths may vary across survey years. The streamer configurations would include up to 16 streamers with 50-75 m separation, an active streamer length of up to 10,050 m, and a streamer depth range of 7-24 m.

The geophysical survey activities will occur within the Project/Study Area including gear deployment and turning between seismic survey lines. Data acquisition activities will occur within the LOF Seismic Survey Area that is within the boundaries of the overall Study Area.

2.1.1 EA COMMITMENTS, CONDITIONS AND MITIGATIONS

Table 5.18 from the original EA document (LGL Limited 2015b) referenced the potential effects and the primary mitigations for the seismic surveys. The potential effects included interference with fishing vessels, damage to fishing equipment, interference with shipping vessels, hearing disturbance/damage to marine mammals, interference with research vessels, disturbance to species at risk, injury to stranded seabirds and exposure to hydrocarbons (LGL 2015b). These mitigations in the original EA and this EA update remain relevant and will be used to minimize project effects from the planned 2024 seismic survey program. A summary of key mitigation measures is provided below.

- The Geophysical, Geological, Environmental and Geotechnical (GGEG) Program Guidelines provided by the C-NLOPB (C-NLOPB 2019), will be adhered to and followed for managing and mitigating the environmental risks associated with the project. The guidelines were updated in 2019 since the submission of the previous EA update.
- The Fisheries and Oceans Canada (DFO) Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP) (DFO 2007) will be used as a guideline for operators to mitigate the effects on marine mammals. This includes planning of seismic surveys, creating and monitoring a safety zone, prescribed marine mammal observation and detection measures, pre-watch details, prescribed start up and shut down. Marine mammals and sea turtles will be recorded and reported to DFO personnel as per SOCP mitigation requirements.
- Any seabird handling will comply with permit conditions of the HMDC obtained Canadian Wildlife Service (CWS) Scientific Permit (bird handling permit) LS2406 to safely handle, release and record any stranded birds on the vessels. This would include any Leach's Storm Petel, classified as a threatened under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessment in 2021. In addition, the marine mammal observers (MMOs) will conduct a monitoring program for seabirds that will include systematic counts based on protocols issued by the Environment and Climate Change Canada-Canadian Wildlife Service (ECCC-CWS). Likewise, mitigation measures and monitoring for stranded birds will follow established ECCC-CWS procedures.
- A Fisheries Liaison Officer (FLO) and a picket vessel will be used to minimize interactions with fishing vessels. Consultation meetings have and will continue to be conducted with fisheries stakeholders through One Ocean or

directly to inform the industry of the planned route and survey area. Considerations will be made to adapt to One Ocean's 2011 review of petroleum seismic survey practices and the fishing industry in the province of Newfoundland and Labrador, as outlined in the original EA (LGL Limited 2015b, Appendix 3).

2.2 PLANNED 2024 PROJECT ACTIVITIES

2.2.1 4D SEISMIC SURVEY

The 2024 seismic survey campaign has been contracted to Shearwater GeoServices and will consist of collection of up to 460 km² of prime 4D marine seismic and navigation data. The campaign will also consist of undershoot and oblique seismic programs which are designed to better improve the seismic image below the Hibernia Gravity Based Structure (GBS). The oblique program for Hibernia is approximately 50 km². The undershoot programs will use a secondary source vessel and will be approximately 25 km².

The surveys will take approximately 60 days, starting in mid to late-May 2024 through July/early-August 2024. The undershoot programs will be conducted at the end of Hibernia Monitor 2 (M2) program and is anticipated to have up to a one-week duration.

The primary seismic streamer vessel, the *Amazon Conqueror*, will tow 12, 6,000 m long multi-component seismic streamers. Streamer separation will be 75 m and streamer depth will 15 m for Hibernia M2. The seismic sources, in tow behind the streamer vessel (*Amazon Conqueror*) and behind the undershoot source vessel (*Shearwater Gallien*), will be typical seismic sources (3,000 – 4,000 in^3; 2000 psi) at a depth of approximately 6 m.

2.2.2 SUPPORT / ESCORT VESSELS

A full-time support and a full-time escort vessel will be on contract through the duration of the program. The supply vessels will be suited to the operating environment and Project activities. They will be used for the duration of the seismic survey program at any given time. The Victory G (supply) and Patrick and William (escort) have been contracted. Shore-based facilities in or near St. John's will be used by the vessels and existing port infrastructure will be used for all support aspects.

Both support vessels will be equipped with a probe to obtain speed of sound velocity profiles and measure conductivity, temperature, and depth throughout the water column. Measurements are typically conducted weekly by lowering the probe to the seabed and then raising it back to the surface using a winch. The frequency of the measurements can be increased to better characterize rapidly changing conditions in the water column.

2.3 CONSULTATIONS

HMDC regularly consults with relevant individuals and stakeholders as part of their on-going and planned operations off Eastern Newfoundland. Consultation is conducted through existing forums (such as the One Ocean initiative) and conducts additional and specific engagements with applicable persons and groups if, and as, issues and requirements arise. Table 2-1 details engagement activities for the 2024 Project activities.

Table 2-1 Engagement Activities for the 2024 Seismic Program Activities.

Stakeholder Group	Date	Description of Engagement
Commercial Fishers	Nov 30, 2023	— Meeting held - Program overview provided to Fish Food and Allied Workers Union (FFAW-Unifor).
	Dec 29, 2023	— Email to FFAW-Unifor regarding Fisheries Liaison Officer arrangements during the Program and update on the timing of information to be shared with FFAW-Unifor members.
	Jan 10, 2024	— Email to FFAW-Unifor with the Program overview and additional details as requested.
	Jan 11, 2024	— Program overview provided at the One Ocean Working Group meeting, attendees included One Ocean Director, FFAW-Unifor, Ocean Choice International (OCI), Atlantic Groundfish Council (AGC), Association of Seafood Producers (ASP) and other Operators.
	Jan 24, 2024	— Email to FFAW-Unifor on the information provided on Jan 10th and status on supporting the seismic research being done by Dr. Corey Morris with the Department of Fisheries and Oceans (DFO).
	Feb 13, 2024	— Email to FFAW-Unifor with an update on collaboration with Dr. Morris seismic research project.
	Feb 23, 2024	— Phone call with FFAW-Unifor to provide an update on collaboration with Dr. Morris seismic research project.
Fisheries and Oceans Canada (DFO)	Feb 1, 2024	— Met with Dr. Morris of DFO on operational activities associated with his seismic research project.
	Feb 7, 2024	— Call with DFO Science on the Program including timing and locations and implications for the DFO scientific cruises. Follow up information to be provided.
Environmental Studies Research Fund (ESRF)	Jan 9, 2024	— Met with Environmental Studies Research Fund (ESRF) to discuss seismic program and better understand if Dr. Corey Morris' (DFO) research would be applicable to our program.
	Jan 9, 2024	— Email to ESRF on expression of interest information posted for Program to share with Dr. Corey Morris to see if sufficient information was included to determine applicability to his work.
	Jan 15, 2024	— Met with ESRF and Dr. Corey Morris to further discuss details of seismic program and understand what Dr. Morris would require to conduct research and how we can support via our seismic program.
	Jan 25, 2024	— Met with ESRF and Dr. Morris to get an update on research funding and next steps to proceed with research. Point of contact for HMDC was provided for going forward to align on operational requirements and execution plan.
	Feb 20, 2024	— Email from Dr. Morris requesting update on information in order to proceed with research planning. Information to be provided.

3 ENVIRONMENTAL SETTING AND ASSESSMENT

An overview of existing physical, biological, and socio-economic environment within the Study/Project Area was presented in the EA and subsequent EA update (LGL Limited 2015a, 2015b). The following sections provide updated information on the species of conservation concern, special areas, and commercial fisheries environmental components.

3.1 SPECIES OF CONSERVATION CONCERN

The conservation status of several species of marine fish, marine birds and marine mammals within the Project Area has changed since the previous EA Update. These changes include a reassessment of a species' status by their respective agency, or the COSEWIC. No changes have taken place to species listed by the Newfoundland and Labrador *Endangered Species Act* (NL ESA).

Schedule 1 of the *Species at Risk Act* (SARA) is the official federal list of species at risk in Canada. Once a species is listed, measures to protect and recover a listed species are established and implemented, including the development of a Recovery Strategy. Action Plans summarize the activities required to meet recovery strategy objectives and goals, and Management Plans set goals and objectives for maintaining sustainable population levels of one or more species that are particularly sensitive to environmental factors. Updates to any recovery strategies, management plans and action plans as it relates to species that may interact with the Project are also provided.

3.1.1 MARINE FISH

Marine fish species of conservation concern with updated conservation status since the previous EA update include (Table 3-1):

- Common Lumpfish (*Cyclopterus lumpus*): Designated as "Threatened" during the November 2017 COSEWIC assessment. (COSEWIC 2019a).
- Shortfin Mako (*Isurus oxyrinchus*): Designation was changed during the May 2019 COSEWIC assessment from "Special Concern" to "Endangered" (COSEWIC 2019b);
- Blue Shark (*Prionace glauca*): Designated as "Not at Risk" during the 2016 COSEWIC assessment.
- Roughhead Grenadier (*Macrourus berglax*): Designated as "Not at Risk" during the 2018 COSEWIC assessment.
- White Shark (*Carcharodon carcharias*): Designation remained as "Endangered" during the May 2021 COSEWIC Assessment (COSEWIC 2021).

No additional biological or ecological information is included here for Shortfin Mako shark and White Shark as they were considered and assessed in the original EA. Biological information for these Schedule 1 listed species can be found in Section 4.6.1.1 of the EA. The status of Blue Shark and Roughhead Grenadier have improved and have therefore been removed from the listing of species of conservation concern in the region. This assessment was based on increasing population trends for these species. Similarly, the Roughhead Grenadier is now listed by COSEWIC as being "Not at Risk" due to increasing population and reduced bycatch due to improved management of the Greenland halibut fishery.

Listed as threatened by COSEWIC in 2017, Common Lumpfish are distributed in both demersal and pelagic environments throughout the North Atlantic as far north as Davis Strait, with highest population densities occurring in the waters surrounding Newfoundland, including the Grand Banks out to the Flemish Cap. With habitat changing throughout the life stages, pelagic environments are most inhabited by young of the year, finding cover and food in floating seaweed. Adults are typically semi-pelagic with a larger focus on benthic environments in the winter

months. Spawning occurs near inshore nests where males create nests surrounding rocky areas and crevices, with males guarding eggs. Throughout all stages of life, Lumpfish are known to often adhere and stick to stones, lobster pots, seaweeds and other objects by an adhesive pelvis disk, preventing drift in ocean currents. Water temperature preference may vary, ideal range being 4-12 ºC for larvae and young of year -1.9-12 ºC for juveniles and adults. Diet for lumpfish includes both pelagic and benthic organisms (often driving where they inhabit the water column) such as eggs and larvae, small jellies, small invertebrates and fish (Simpson et al. 2016, COSEWIC 2019a). The main threats to population include fishing, habitat alterations, predation and seismic exploration.

The potential environmental effects on these species are similar to those outlined for other marine finfish in the EAs, and the species-specific description given in the EAs (LGL Limited 2015a, 2015b). Mitigation measures described in the original EA for other marine finfish species will also apply to common lumpfish, white hake and haddock, and thus Project activities are not likely to result in significant adverse effects.

Table 3-1 Updated Marine Fish Species at Risk or Otherwise of Special Conservation Concern.

Species		Status / Designation[1]			
Common Name	Scientific Name	NL ESA	SARA (Schedule 1)	COSEWIC	Relevant Population (Where Applicable)
Acadian Redfish	*Sebastes fasciatus*			T	Atlantic (COSEWIC)
American Eel	*Anguilla rostrata*	V		T	
American Plaice	*Hippoglossoides platessoides*			T	Newfoundland and Labrador (COSEWIC)
Atlantic Bluefin Tuna	*Thunnus thynnus*			E	
Atlantic Cod	*Gadus morhua*			E	Newfoundland and Labrador (COSEWIC);
Atlantic Salmon	*Salmo salar*			T	South Newfoundland
				SC	Quebec Eastern North Shore
				SC	Quebec Western North Shore
				E	Anticosti Island
				SC	Inner St. Lawrence
				SC	Gaspe-Southern Gulf of St. Lawrence
				E	Eastern Cape Breton
				E	Nova Scotia Southern Upland
				E	Outer Bay of Fundy Population
Basking shark	*Cetorhinus maximus*			SC	Atlantic (COSEWIC)
Cusk	*Brosme brosme*			E	
Deepwater Redfish	*Sebastes mentella*			T	Northern (COSEWIC)
Common Lumpfish	*Cyclopterus lumpus*			T	
Northern (Broadhead) Wolffish	*Anarhichas denticulatus*		T	T	
Porbeagle	*Lamna nasus*			E	
Roundnose Grenadier	*Coryphaenoides rupestris*			E	
Shortfin Mako	*Isurus oxyrinchus*			E	Atlantic (COSEWIC)
Spiny Dogfish	*Squalus acanthias*			SC	Atlantic (COSEWIC)
Spotted Wolffish	*Anarhichas minor*		T	T	
Striped (Atlantic) Wolffish	*Anarhichas lupus*		SC	SC	

Species		Status / Designation[1]			Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA (Schedule 1)	COSEWIC	
Thorny Skate	*Amblyraja radiata*			SC	
White Hake	*Urophycis tenuis*			T	Atlantic and Northern Gulf of St. Lawrence (COSEWIC)
White Shark	*Carcharodon carcharias*		E	E	Atlantic (COSEWIC/SARA)
Winter Skate	*Leucoraja ocellata*			E	Eastern Scotian Shelf – Newfoundland (COSEWIC)

[1] Least Concern (LC), Vulnerable (V), Near Threatened (NT), Special Concern (SC), Threatened (T), Endangered (E), Critically Endangered (CE) (blank cells indicate it has not been assessed)

Grey cells represent changes to status or addition of species listing from the most recent EA update.

RECOVERY STRATEGIES AND PLANS

New critical habitat was set out in the 2020 Recovery Strategy (DFO 2020) for spotted and northern wolffish, primarily along the edge of the Grand Banks and Labrador Shelf (refer to Section 3.2). The critical habitat considered inclusion of areas that function to support all portions of wolffish life history. These habitats were delineated based on species-specific seasonal presence in association with environmental parameters. Northern wolffish critical habitats are located between 118-636 m depth with sea bottom temperatures of 2.3-5.1°C. Spotted wolffish habitats are located between 82-346 m with sea bottom temperatures of 0.1-4.2°C. No critical habitat has been established for the Atlantic wolffish (DFO 2020). There is no overlap between project activities and wolffish critical habitats, therefore the seismic survey is unlikely to have potential effects on the quality of critical habitats.

3.1.2 MARINE BIRDS

Marine bird species of conservation concern with updated conservation status since the previous EA update include (Table 3-2):

- Leach's Storm-Petrel (*Oceanodroma leucorhoa*): Designated as "Threatened" during the November 2020 COSEWIC assessment (COSEWIC 2020). Currently under consideration for addition under SARA Schedule 1.

Leach's Storm-Petrel is a threatened species under COSEWIC designation as of 2020 (COSEWIC 2020). The species is found along the coast of eastern and southern coasts of Newfoundland during breeding season and typically over-winters in equatorial regions. Leach's Storm-Petrel is a surface feeder, known to travel over or beyond the continental shelf up to 400-800 km away from nesting colonies in search of food. During non-breeding period, Leach's Storm-Petrel is found in warm nutrient rich waters with upwelling present. Low adult survival related to higher predation rates by gulls at colonies is a factor in their observed declines. Attraction to anthropogenic light and associated collisions and strandings as well as changes to the food web are also considered threats to this species. (COSEWIC 2020).

Table 3-2: Updated Marine and Migratory Bird Species at Risk or Otherwise of Special Conservation Concern.

Common Name	Scientific Name	Status / Designation[1]			Relevant Population (Where Applicable)
		NL ESA	SARA (Schedule 1)	COSEWIC	
Ivory Gull	*Pagophila eburnea*	E	E	E	
Leach's Storm-Petrel	*Oceanodroma leucorhoa*			T	Atlantic (COSEWIC)

[1] Least Concern (LC), Vulnerable (V), Near Threatened (NT), Special Concern (SC), Threatened (T), Endangered (E), Critically Endangered (CE) (blank cells are considered to be not assessed)

Grey cells represent changes to status or addition of species listing from the most recent EA update.

RECOVERY STRATEGIES AND PLANS

No new recovery strategies or management plans for marine birds have been released since the previous EA update.

3.1.3 MARINE MAMMALS AND SEA TURTLE

No marine mammals or sea turtles have had updated conservation status since the last EA update (Table 3-3). Reassessments for marine mammals and sea turtles included the following:

- Killer Whale (*Orcinus orca*): Designation remained as "Special Concern" during the December 2023 COSEWIC Assessment (Government of Canada 2023).

However, observations of Northern Bottlenose Whale on the Grand Banks and slope areas (Oyarbide et al. 2023, Feyrer et al. 2024) suggest that they may potentially transit through the Study Area. Therefore, this species has been added to the listing of marine mammal and sea turtles of conservation concern that may occur in the Project Area.

The Northern Bottlenose Whale is known to inhabit waters greater than 500 metres in depth and is typically distributed along the continental shelf. The Davis Strait-Baffin Bay-Labrador population of bottlenose whale was listed as a COSEWIC species of special concern as of 2011 while the Scotian Shelf population is listed as endangered under SARA (Schedule 1) and COSEWIC. The distribution of these species includes the Grand Banks (COSEWIC 2011, DFO 2017a) but recent modelling analysis indicates that important habitat for foraging, movement and life history functions are concentrated on the continental shelf edge (Feyrer et al. 2024).

Table 3-3: Updated Marine Mammal and Sea Turtle Species at Risk or Otherwise of Special Conservation Concern likely to Occur in the Project Area.

Species		Status / Designation[1]			Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA[2]	SARA (Schedule 1)	COSEWIC	
Blue Whale	*Balaenoptera*		E	E	Atlantic (COSEWIC/SARA);

Species		Status / Designation[1]			Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA[2]	SARA (Schedule 1)	COSEWIC	
	musculus				
Fin Whale	*Balaenoptera physalus*		SC	SC	Atlantic (COSEWIC/SARA);
Harbour Porpoise	*Phocoena*			SC	Northwest Atlantic (COSEWIC);
Killer Whale	*Orcinus orca*			SC	Northwest Atlantic / Eastern Arctic (COSEWIC);
Leatherback Sea Turtle	*Dermochelys coriacea*		E	E	Atlantic (COSEWIC/SARA);
Loggerhead Sea Turtle	*Caretta caretta*		E	E	
North Atlantic Right Whale	*Eubalaena glacialis*		E	E	
Northern Bottlenose Whale	*Hyperoodon ampullatus*			SC	Davis Strait-Baffin Bay-Labrador Sea (COSEWIC)
			E	E	Scotian Shelf (COSEWIC/SARA)
Sowerby's Beaked Whale	*Mesoplodon bidens*		SC	SC	

[1] Least Concern (LC), Vulnerable (V), Near Threatened (NT), Special Concern (SC), Threatened (T), Endangered (E), Critically Endangered (CE) (blank cells are considered to be not assessed)

[2] No marine mammals or sea turtles are listed under the NL ESA

Grey cells represent changes to status or addition of species listing from the EA update.

RECOVERY STRATEGIES AND PLANS

Since the previous EA update, an Action Plan was developed for North Atlantic right whale (DFO 2021). It details recovery strategies objectives including reducing mortality and injury from vessel strikes and fishing gear, reducing disturbance from vessel presence, and increasing monitoring, research and education towards recovery of the species. Critical habitat has been previously established for this species in the Grand Manan Basin and Roseway Basin, however they are well outside the Study Area. A management plan has been established for fin whales in 2017 (DFO 2017c). Key threats to this species include anthropogenic noise including seismic programs and vessels, ship strikes, fishing gear entanglement and exposure to contaminants and spills. A review of the plans determined that no new or modified mitigation measures are required beyond those already identified in the EA (LGL Limited 2015b).

3.2 POTENTIALLY SENSITIVE AREAS

There have been changes made to potentially sensitive areas since the most recently approved EA document. DFO has identified significant areas of cold-water corals and sponge dominated communities on the Grand Banks through analysis of the research vessel trawl data and other sources. DFO has identified these Significant Benthic Areas (SiBAs) for sea pens, sponges, small gorgonian corals and large gorgonian corals (DFO 2017b). Within the Study Area, but outside the LOF Seismic Study Area is a small gorgonian coral SiBA. There will be no seismic activities

outside the LOF Seismic Study Area, therefore, the interaction of project activities and this potentially sensitive area would be limited.

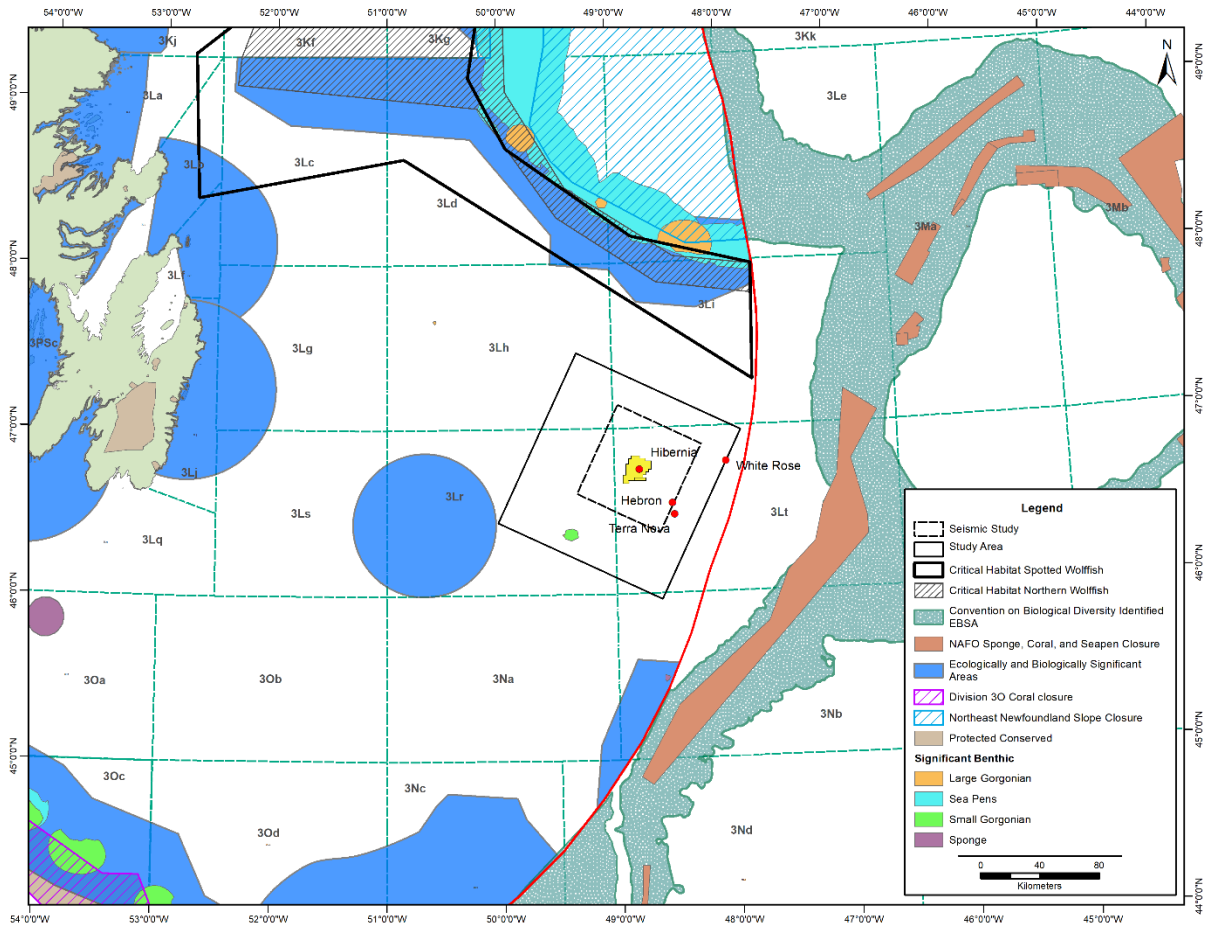


Figure 3-1 Potentially sensitive areas within the Study Area and wider region.

3.3 COMMERCIAL FISHERIES

Commercial fisheries activity (2017-2021) in the Project Area is similar to previous EAs with fishing effort mainly to the north of the Study Area. Figure 3-2 to Figure 3-4 provides the updated geographic distribution of domestic commercial fishing activity in the region in relation to the Study Area. The information provided in these maps is based on the geospatial data received from DFO. They show the intensity of recorded fishing activity for a series of 6 x 4 nautical mile “cells” that together comprise a map grid that covers the region. The information represents the fishing intensity for all years from 2017 to 2021, aggregated for all species. The data is quantified using Jenk's (Natural Breaks) classification, where each grid square represents the number of fishing records for the location, the resulting heat map indicates areas of greatest activity.

The Study Area encompasses areas historically fished with both mobile (Figure 3-3) and fixed gear types (Figure 3-4). Overall, the fishing activity from the 2017-2021 dataset is similar to what has previously been assessed for the Project. Fishing intensity within the study areas are relatively low to moderate relative the region. Snow Crab fisheries occur within the Study Area as described in the EA (LGL 2015b), however, fishing intensity is low relative

to the slope of the Grand Banks that is north of the study areas (Figure 3-5). Northern shrimp was previously considered a primary fishery within the study areas (LGL Limited 2015a, 2015b), however directed fishing for shrimp was suspended in Division 3L (Shrimp Fishing Area 7) in 2015 (DFO 2018). Therefore, there is no recent fishing effort within the study areas (Figure 3-6). Fishing for offshore clams (e.g., Propellor Clam, Stimpson's surf Clam, Greenland Cockle) is conducted with a dredge and may occur year-round (DFO 2023). The fishing intensity within the study areas are low to moderate based on recent fishing patterns (Figure 3-7). Other important fisheries identified in the EA that were historically fished within the study areas included Atlantic Cod, Witch Flounder, and Yellowtail Flounder. The distribution of fishing effort for these species is outside of the study areas based on recent fishing patterns (Figure 3-8 to Figure 3-10).

The probability of interactions with fishers and fishing gear remains low as previously assessed with the implementation of commercial fisheries mitigation measures, including communication through One Ocean and use of a FLO (refer to Section 2.1.1). HMDC will continue to engage with commercial fishers (see Section 2.3) to coordinate 2024 Project Activities and minimize potential effects.

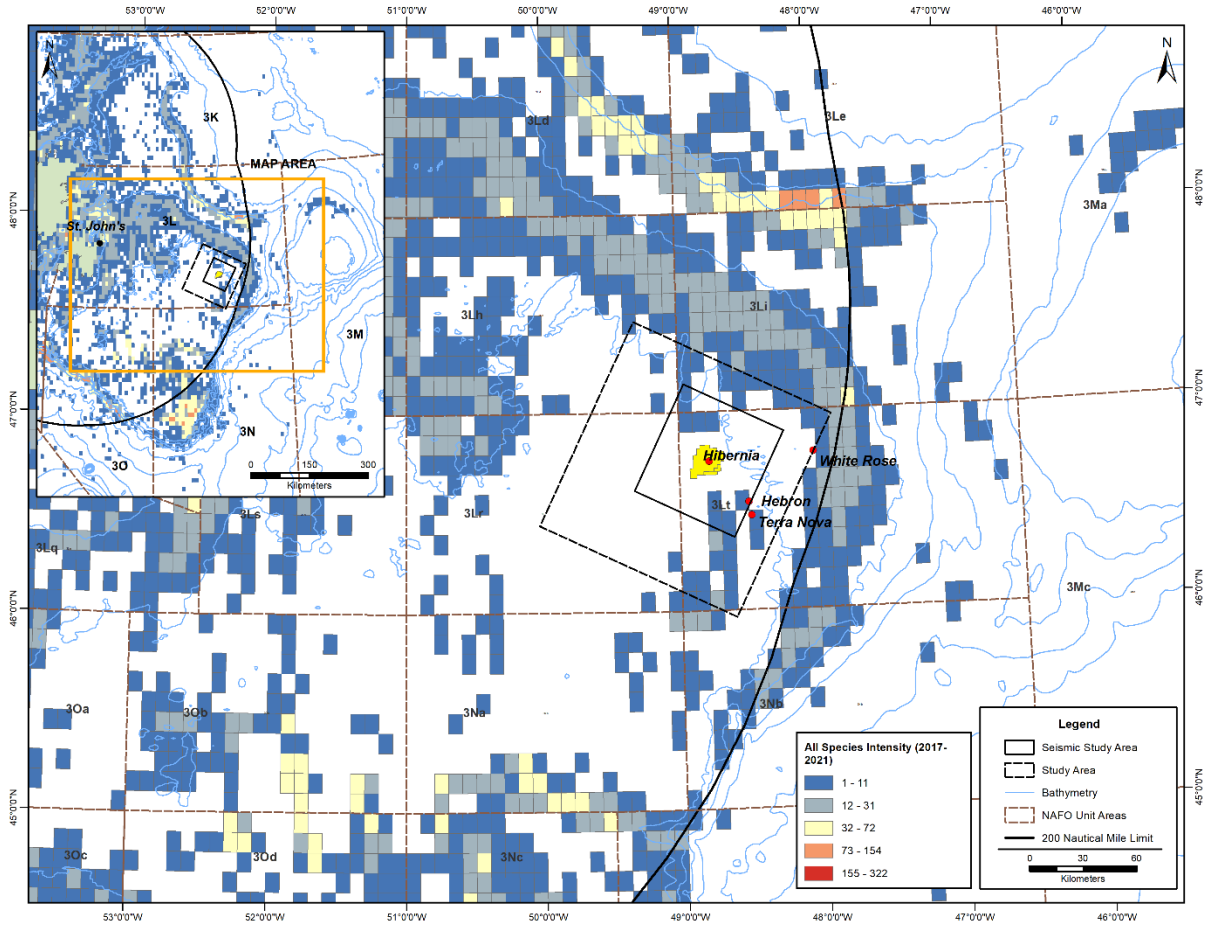


Figure 3-2 Commercial Fishing Intensity; All Species (2017-2021).

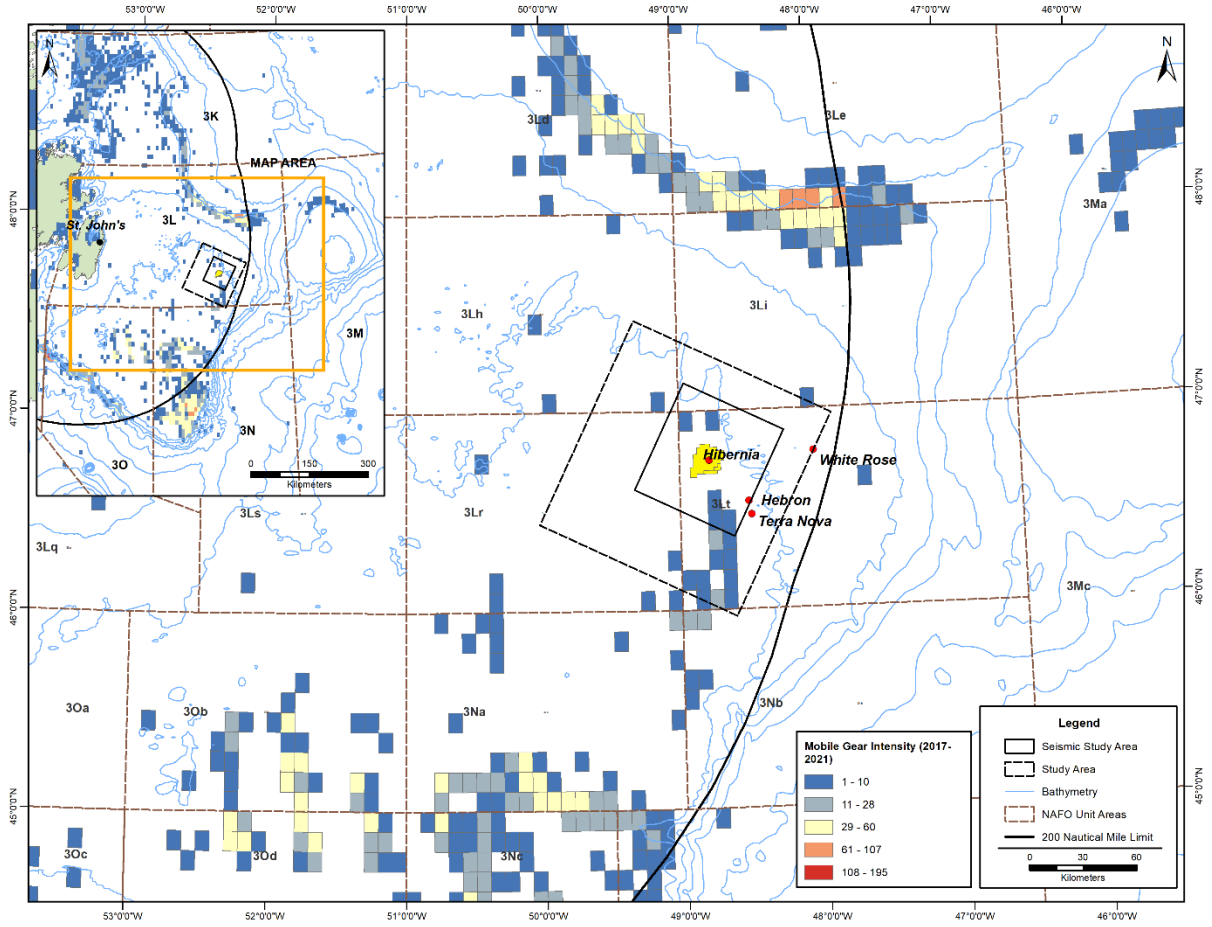


Figure 3-3 Commercial Fishing Intensity; Mobile Gear Types (2017-2021).

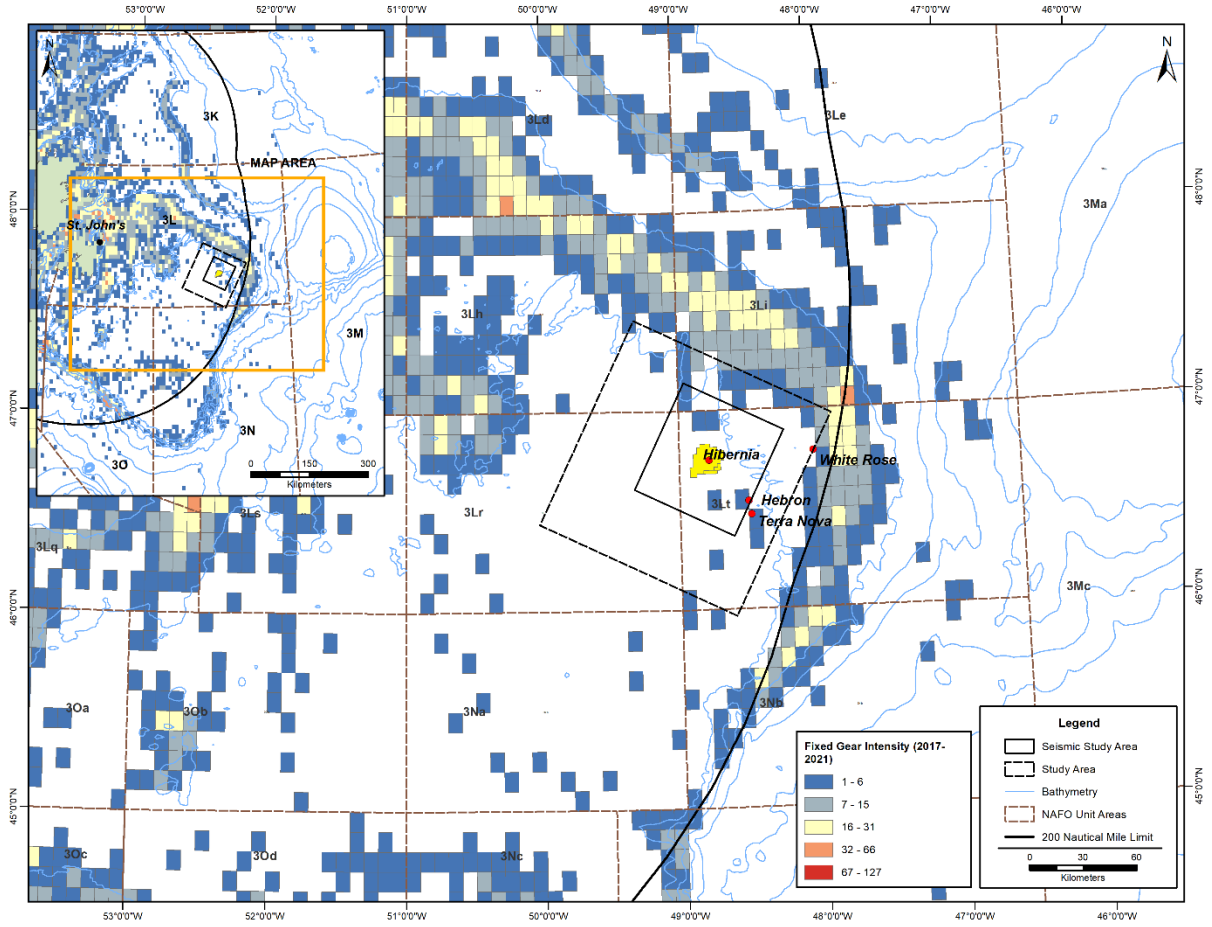


Figure 3-4 Commercial Fishing Intensity; Fixed Gear Types (2017-2021).

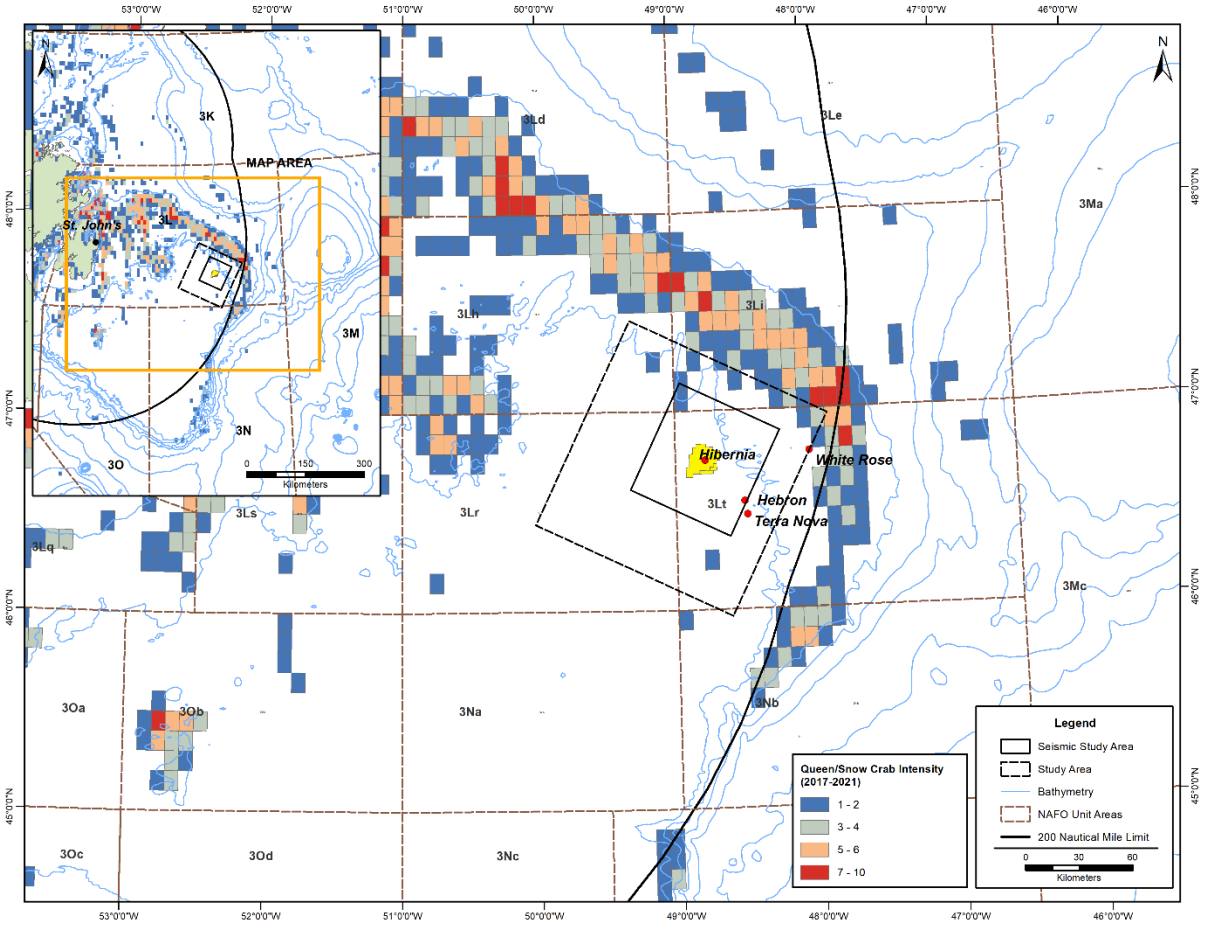


Figure 3-5 Commercial Fishing Intensity: Snow Crab (2017-2021).

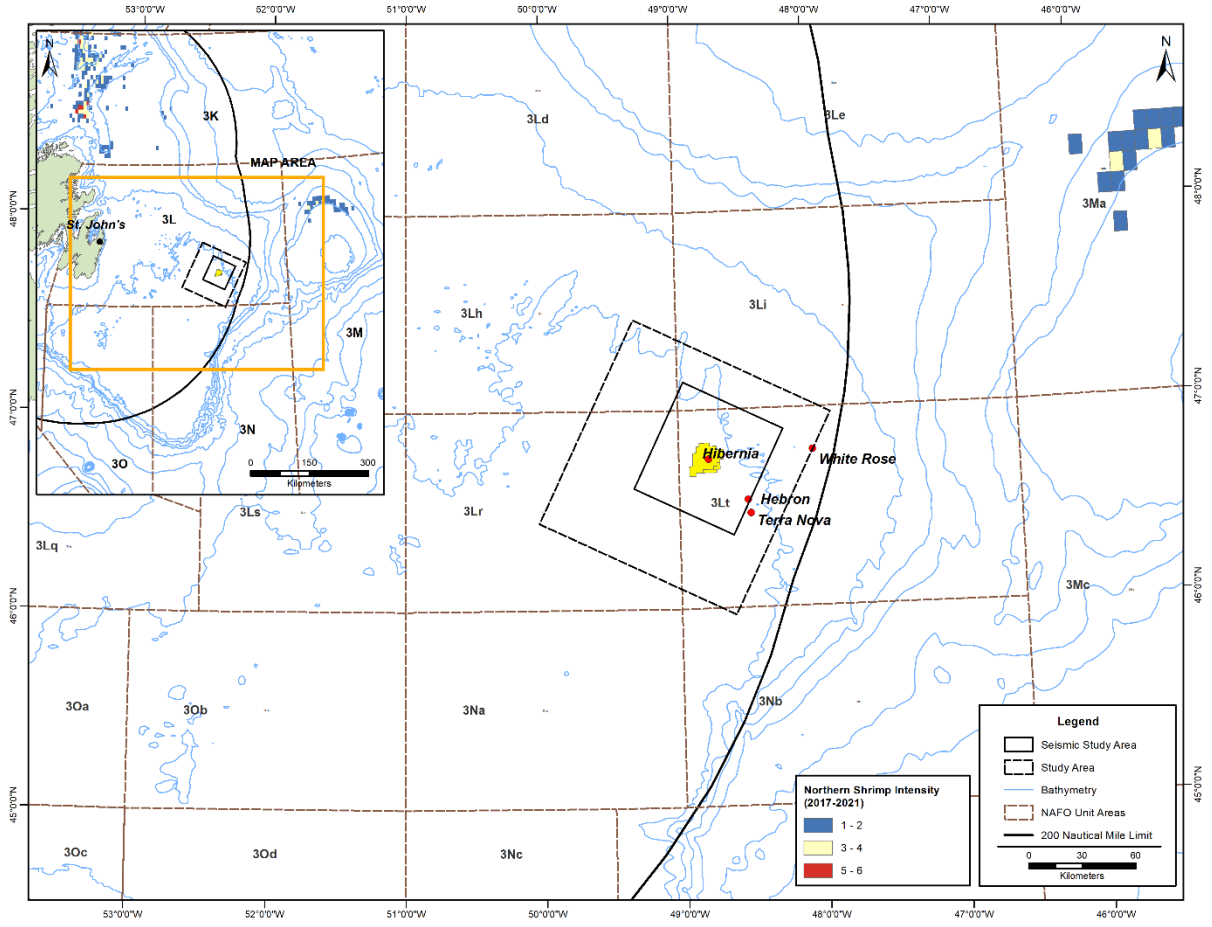


Figure 3-6 Commercial Fishing Intensity: Northern Shrimp (2017-2021).

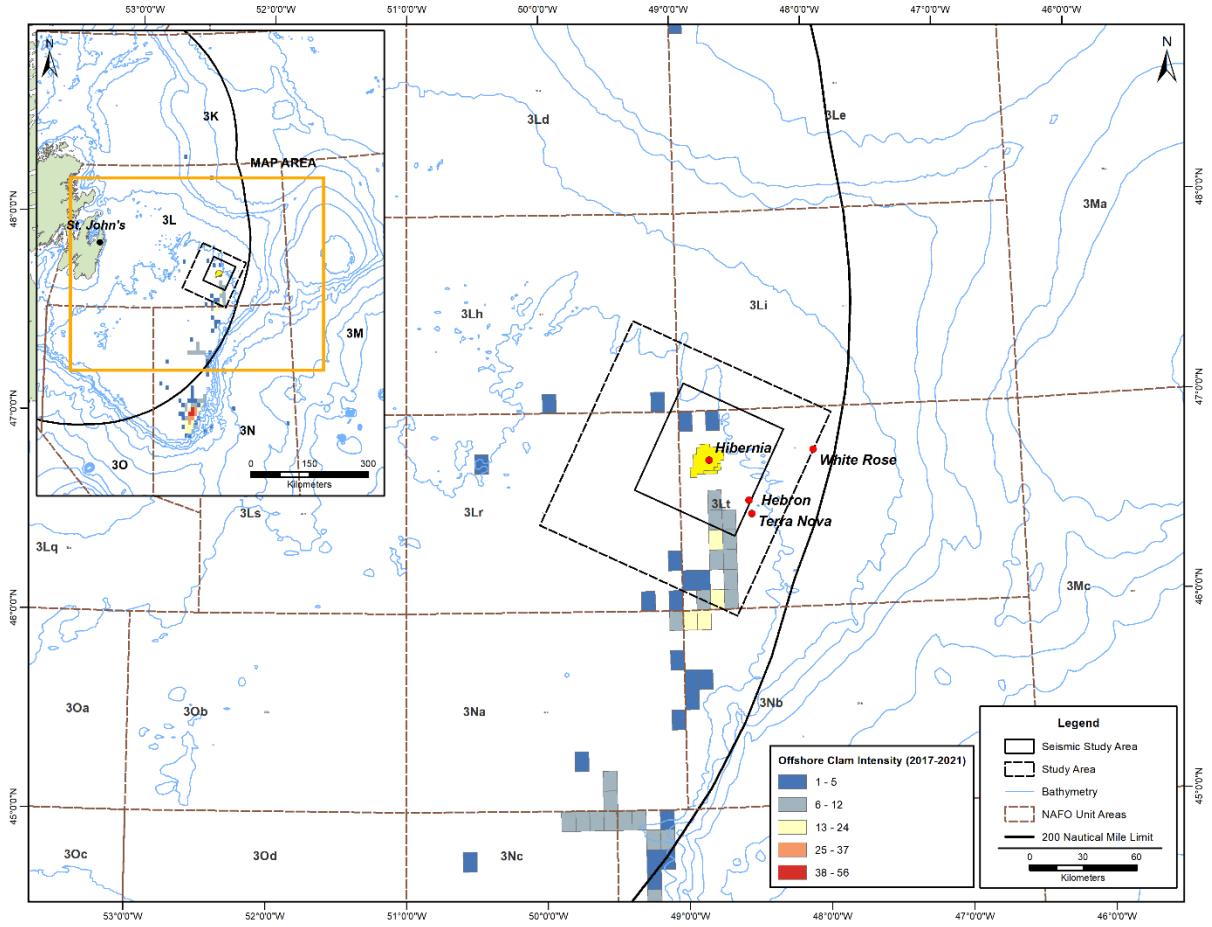


Figure 3-7 Commercial Fishing Intensity: Offshore Clam (2017-2021).

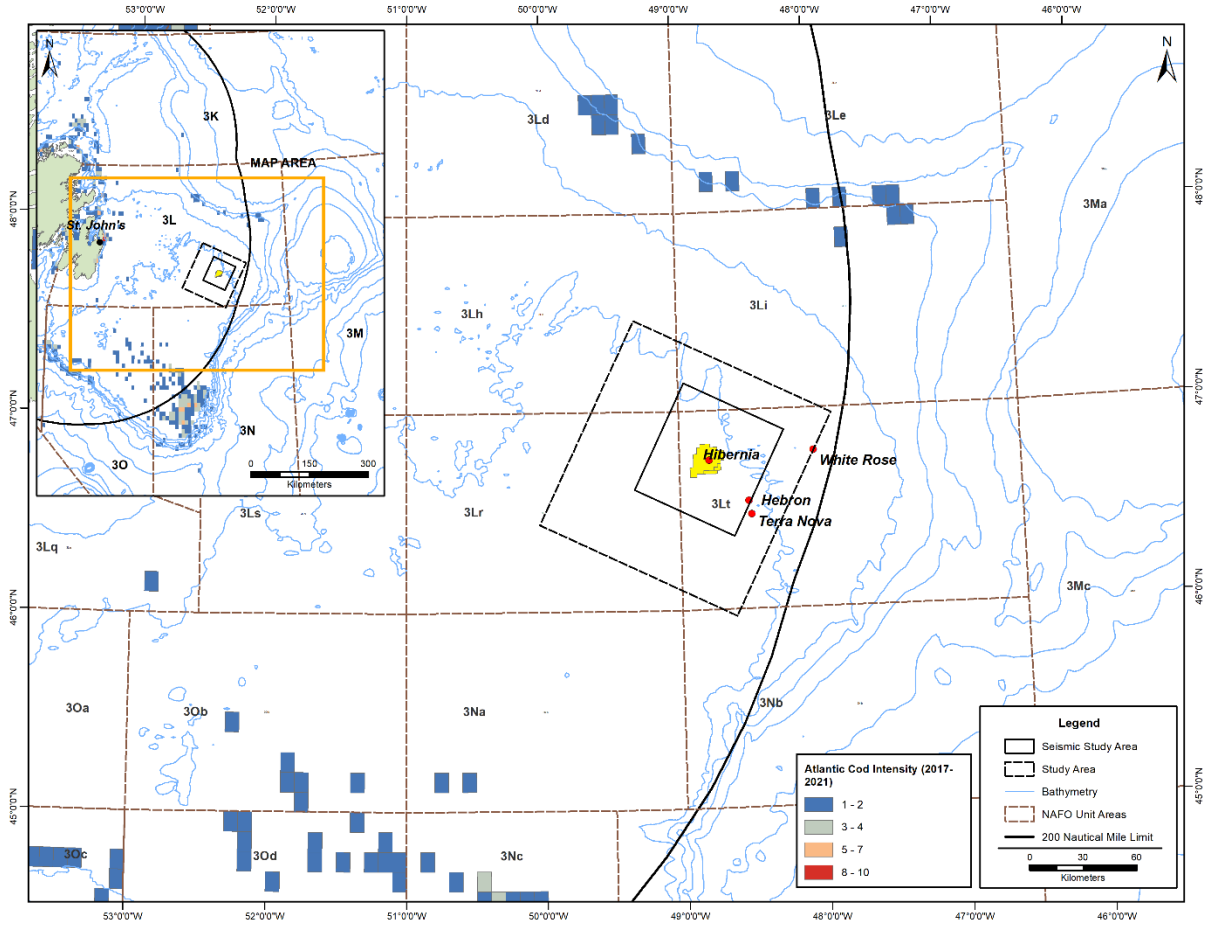


Figure 3-8 Commercial Fishing Intensity; Atlantic Cod (2017-2021).

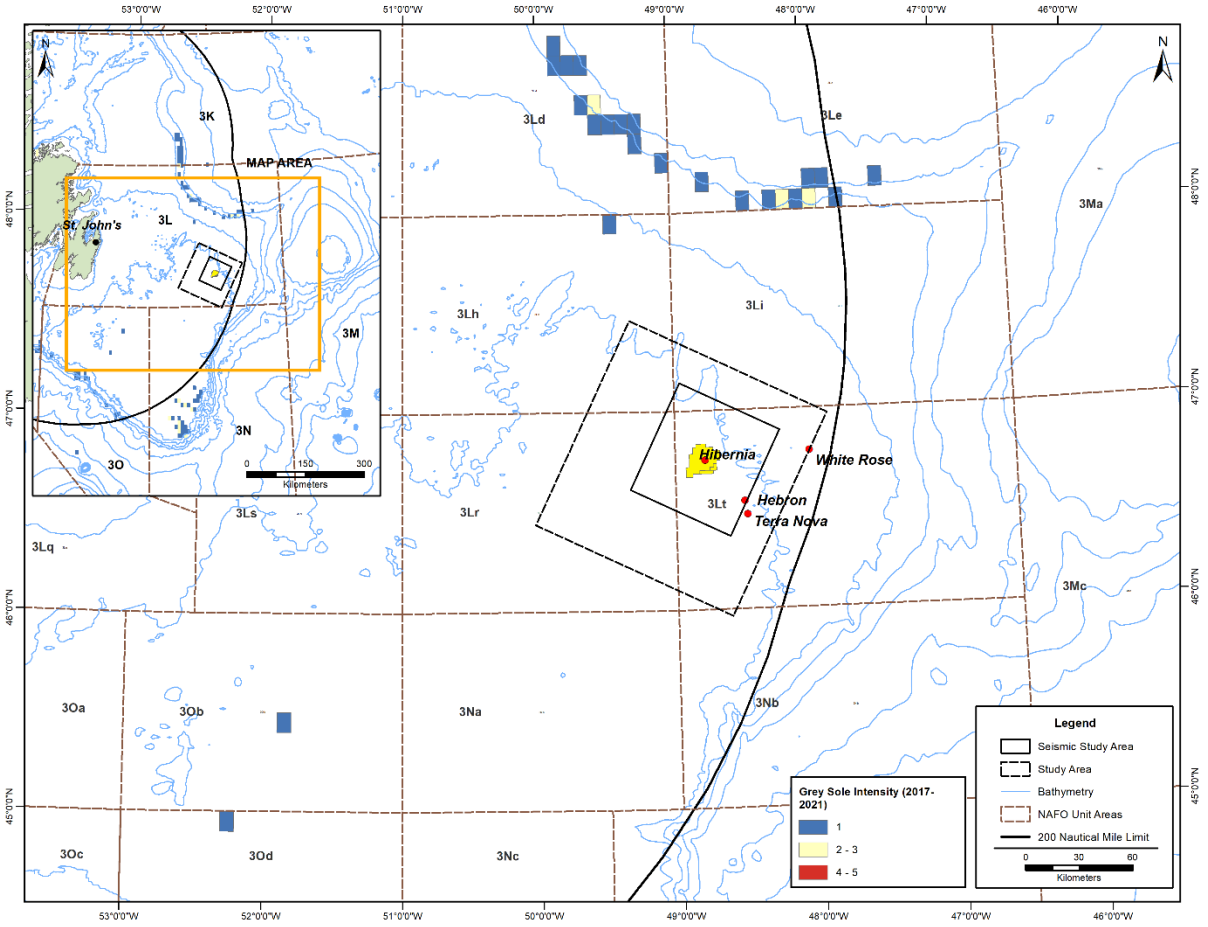


Figure 3-9 Commercial Fishing Intensity: Grey Sole/Witch Flounder (2017-2021).

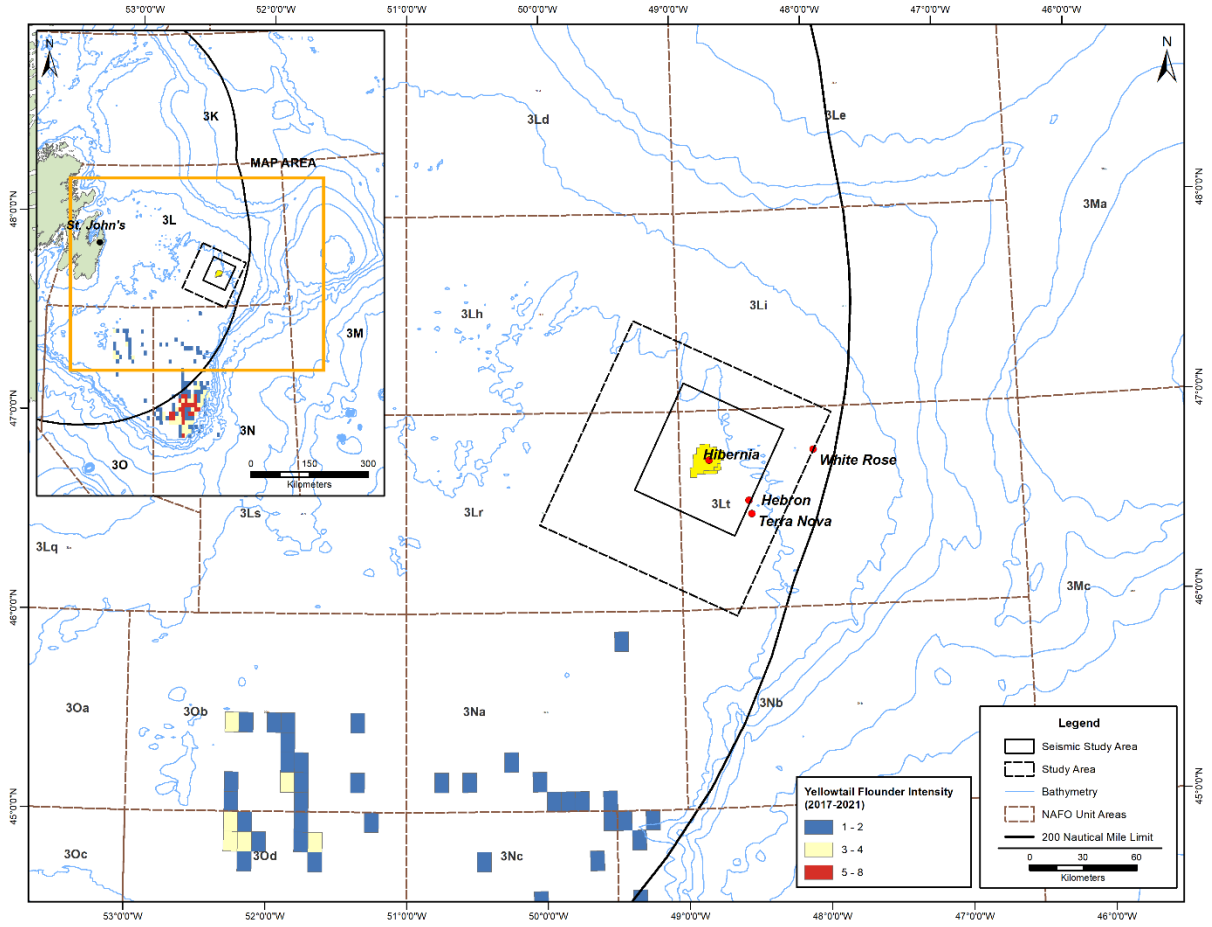


Figure 3-10 Commercial Fishing Intensity; Yellowtail Flounder (2017-2021).

INDUSTRY AND DFO SCIENCE SURVEYS

DFO and fishing industry research surveys occur annually and are previously described in the EA and EA update (LGL Limited 2015a, 2015b). DFO scientific surveys are anticipated to occur around the Hibernia field between April and June of 2024. HMDC will continue to discuss the Project activities and schedule with DFO and the fishing industry through existing and relevant forums (e.g., One Ocean). The timing of the research survey activities will be considered in the planning and undertaking of the seismic survey program. The distribution of previous halibut longline and post season crab survey locations are presented in Figure 3-11.

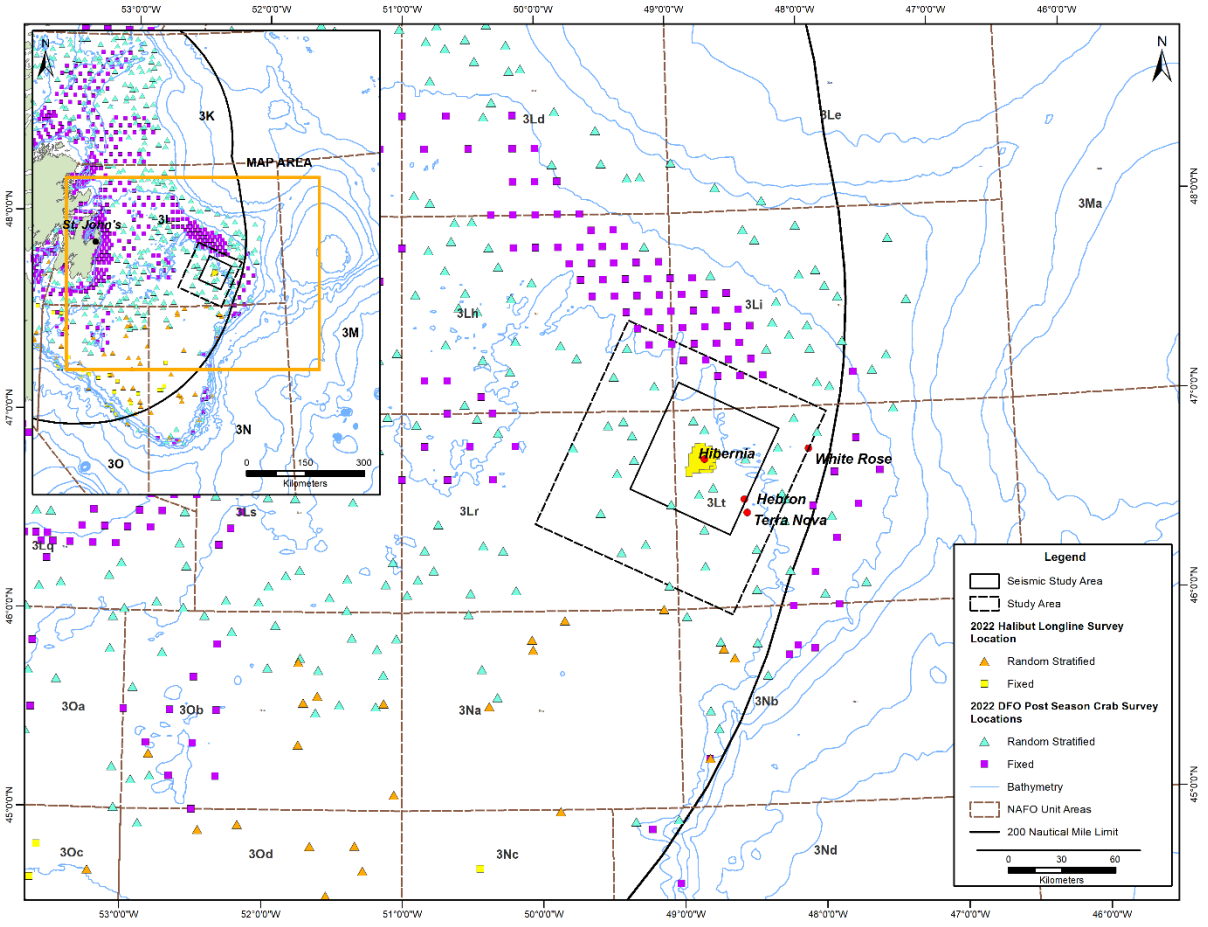


Figure 3-11 Distribution of locations for the 2022 halibut longline and post season crab survey locations.

4 ENVIRONMENTAL EFFECTS ASSESSMENT AND SUMMARY

The planned seismic activities that HMDC plans to conduct in 2024 (Section 2.2) are aligned with the nature and scope of the Project as described, assessed, and approved under the EA process for the Project. Since the previous EA update, there have been updates to key environmental components, including species of conservation concern, potentially sensitive areas, and commercial fisheries.

The conservation status for several species has changed with additional species listings and de-listing of species. Critical habitat for spotted and northern wolffish was also established in 2020, however, it does not overlap with the Study Area. The mitigation measures for marine biota (Section 2.1.1) would also apply to any species of conservation concern. Key mitigations for minimizing effects on marine biota include following the GGEG Program Guidelines and SOCP as well as the use of qualified environmental monitors for marine mammals.

Since the previous EA update, a SiBA for small gorgonian corals inside the Study Area was delineated. However, there would be limited interaction between potential project activities in the area (e.g., vessel transit) and the corals on the seafloor. Furthermore, mitigations associated with minimizing Project effects on Fish and Fish Habitat including following the SOCP would be applicable to potential sensitive areas.

The spatial distribution of commercial fishing within the Study Area is similar to previous years. Snow crab remain as the main fishery distributed within the area. Key mitigation measures for minimizing effects on fisheries and fishing gear include avoidance in time and space of concentrated fishing areas, good communication, deployment of FLOs, a single point of contact for the program, and a fishing gear compensation program.

The resulting potential interactions and effects of Project activities and components as assessed in the revised EA remain unchanged from updates to the environmental and commercial fisheries components. The updated information does not alter the environmental effects predictions, required mitigation or associated determinations related to environmental effects significance for any receptors.

The combination of good planning and communication, proven operational practices and procedures, standard mitigations, and relevant regulatory procedures and guidelines remain applicable to the nature and scope of HMDC's planned 2024 seismic survey. These mitigations will continue to be implemented in accordance with HMDC commitments and obligations pursuant to the Project's EA approval and other applicable legislative and regulatory requirements.

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