



Environmental Assessment Update: Hibernia Project Operations 2016

FINAL REPORT

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1 INTRODUCTION

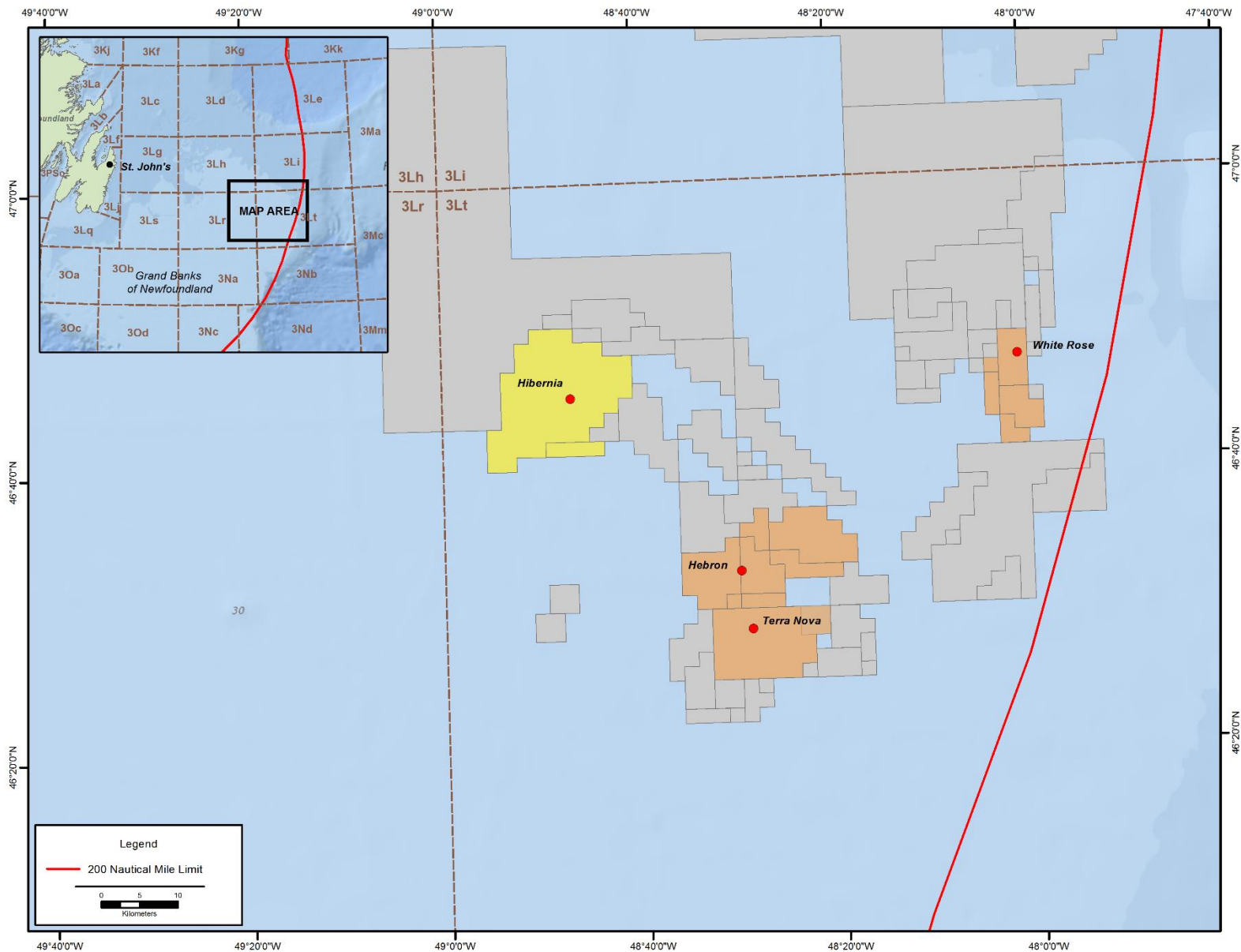
The Hibernia oil field is located offshore Newfoundland and Labrador, Canada in the Jeanne d'Arc Basin which underlies the northwestern portion of the Grand Banks, approximately 315 kilometres east-southeast of St. John's (Figure 1.1). The oil field was first discovered in 1979, and consists of two principal reservoirs - Hibernia and Ben Nevis-Avalon – and is located in water depths of approximately 80 metres. The Hibernia development was subject to a detailed and comprehensive Environmental Assessment (EA) review in the mid 1980s, pursuant to the requirements of the EA review processes in place at that time. The development phase of the overall Hibernia Project commenced in late 1990 and continued until the eventual mating of the Project's gravity based structure (GBS) and its topsides at Bull Arm NL in 1997, after which the platform was towed to and installed at its site on the Grand Banks in June of that year. Commercial production from the Hibernia oil field commenced in November 1997 and is on-going, along with associated environmental management and regular environmental effects monitoring (EEM) and reporting activities.

In recent years, the Hibernia development has been further expanded to include the Hibernia Southern Extension (HSE), a subsea development consisting of various water injection wells connected to the Hibernia platform by subsea flowlines. As part of planned future extensions to the Hibernia development, a separate and subsequent EA review for the *Hibernia Drill Centres Construction and Operations Program* (CEAR No. 08-01-42279) was completed pursuant to the requirements of the *Canadian Environmental Assessment Act* (CEAA). That EA review commenced with the Proponent's submission of a Project Description to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in August 2008, which was followed by determinations by relevant government departments and agencies regarding their respective regulatory interests in the Project, associated EA track decisions, and the eventual issuance of an EA Scoping Document by the C-NLOPB for the required Screening-level EA review of the Project. The Proponent subsequently prepared and submitted an EA Report for the Project in December 2008, which was subject to review and comment by relevant agencies and organizations, followed by subsequent requests for, and the submission and review of, additional information which continued to September 2009. On September 21, 2009 the relevant EA regulators issued the EA determination for the Project, with stated that the EA documentation provided “describe the Project in sufficient detail and provides an acceptable assessment of the potential environmental effects of the Project” and that “the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects”. Associated development (drilling) activities at HSE subsequently commenced in 2013.

Since the above described EA process was completed and associated regulatory approvals for the Project were obtained, and in keeping with standard practice for offshore petroleum projects in the Newfoundland and Labrador Offshore Area, the Proponent has subsequently prepared and submitted a number of annual EA Updates for the Project. This includes previous EA Updates for each year from 2010 to 2015, which provided an overview of planned Project activities for the upcoming year, updated any applicable environmental baseline information for key environmental components that had become available since the original EA and previous EA Updates were produced, describe any public and stakeholder consultation activities that have occurred, and evaluate and confirm that the nature and scope of the planned activities are within the scope of those assessed and approved in the EA review, including the appropriateness and adequacy of the associated environmental effects predictions and mitigation measures.

This document provides the 2016 EA Update for the Hibernia Project Operations.

Figure 1.1 Project Area



2 PROJECT DESCRIPTION (PLANNED 2016 ACTIVITIES)

In 2016, normal drilling and production operations will continue as usual on the Hibernia platform. Drilling will continue at the HSE location and an EEM program for the core Hibernia platform area and the HSE area will be carried out.

This section provides an overview of the various Project components and activities that are planned to occur in the coming year.

2.1 Subsea Work – Hibernia South Extension

Installation of additional subsea equipment at the HSE location was completed in 2015. Commissioning of one subsea water injection well (P-02 02Z) was completed in 2015 and one in January 2016 (P-02 04). There is the potential to commission up to three water injection wells in 2016 once drilling is completed. Commissioning work involves installation of Christmas trees and connecting equipment such as well jumpers, hydraulic flying leads and electrical flying leads. This work will be conducted by the West Aquarius Mobile Offshore Drilling Unit (MODU).

2.2 Drilling

In 2015 the West Aquarius MODU drilled and completed the P-02 02Z and P-02 04 wells. During 2016, Hibernia Management and Development Company Ltd. (HMDC) plans to drill three water injection wells within the HSE Excavated Drill Center (EDC). This will include a total of three riserless sections, one 1,067 mm section and two 660 mm sections. Riser-connected drilling will use non-aqueous drilling fluid.

In 2016, the West Aquarius MODU may also drill a delineation well. The exact location for the NW Wedge delineation well has yet to be finalized, but will be located within the previously described Project Area. The exact location will be provided in the associated Approval to Drill a Well (ADW) application. If drilled, this well will consist of two riserless sections drilled with water-based fluids (1,067 mm and 660 mm) and two riser connected sections drilled with non-aqueous fluids. There will not be an excavated drill center (EDC) at the NW Wedge location and drill cuttings will be deposited in the immediate vicinity of the wellbore. After evaluation, the well will be plugged and abandoned and all wellhead equipment recovered from the seafloor.

2.3 Potential Wellsite Geohazard Survey

There is a potential requirement to complete a wellsite geohazard survey in 2016 within the Hibernia Project Area for a Hibernia area potential delineation well. Although the specific characteristics of this survey have not yet been finalized, the survey equipment and activities would be the same or very similar to that described in the 2014 EA Update, as summarized below.

The 2016 wellsite geohazard survey equipment suite to acquire potential delineation wellsite information (approximately 5 km x 5 km site) would be similar to the 2014 equipment suite which consisted of:

- high resolution multichannel (2DHR): 160 cubic inch source, 600 to 1,200 m streamer;
- Deep Tow System (DTS) (0.5 to 15 kHz) sub-bottom profiler (SBP1) or equivalent;
- hull-mounted sub-bottom profiler (SBP2);
- side scan sonar: dual frequency: 100 / 500 kHz;

- multibeam echosounder: 200 to 450 kHz;
- magnetometer;
- towed seabed camera / video; and
- seabed sediment grab samplers.

If the geohazard survey proceeds in 2016, detailed information will be provided in the Authorization application.

2.4 Consultations

As part of its on-going operations and activities associated with the Hibernia Project (including the associated HSE), HMDC consults with relevant individuals and stakeholders through existing and relevant forums (such as the One Ocean initiative), and conducts additional and specific engagements with applicable persons and groups if and as particular issues and requirements arise.

Details on the various 2016 activities that are described in this EA Update will be communicated to and discussed with these groups through the above described forums.

2.5 Planned 2016 Activities in Relation to the Overall Project and EA Scope

The planned 2016 activities described earlier in this Chapter are in keeping with the nature and scope of the Project as described, assessed and approved under the EA process for the Project.

Chapter 2 (Project Description) of the Final EA Report (July 2009), for example, included and described the equipment and associated construction and installation activities that would be associated with the drilling of wells (Section 2.1.2) and associated geohazard surveys (Section 2.1.3), as well as outlining the eventual production and abandonment activities, schedule and logistics, and associated environmental discharges, emissions and environmental management systems. Each of these components and activities were also considered and addressed through the associated environmental effects assessment in the EA (Chapters 6 - 8), including in the identification and proposal of associated mitigation measures to avoid or reduce any negative environmental effects resulting from these activities.

Each of these environmental issues / effects and associated mitigations measures (as reflected in the EA Report and subsequent EA submissions) remain applicable to the nature and scope of the planned 2016 Project activities, and will be implemented in accordance with the Operator's commitments and obligations pursuant to the Project's EA approval and other applicable legislative and regulatory requirements.

3 ENVIRONMENTAL SETTING, POTENTIAL INTERACTIONS AND MITIGATION

The original EA and subsequent EA Updates for the Project provided a detailed overview of the existing (baseline) environment within and around the proposed Project Area, including relevant aspects of the existing physical, biological and socioeconomic environments. In keeping with previous EA Updates for this and other projects in the NL Offshore Area, this section provides updated information related to the following environmental components, for which any associated changes are considered to be particularly relevant to on-going environmental planning and management related to the Project:

- 1) Commercial Fisheries; and
- 2) Species at Risk.

3.1 Commercial Fisheries

Fisheries were a key area of focus of the EA review for the Project, and on-going Project planning and implementation have likewise placed a high degree of emphasis on addressing the potential for interactions with Project components and activities and commercial fishing activity within and near the Project Area.

The previous EA documentation included a detailed description of commercial fisheries in the region based on existing data sources and other information that was available as of the time of EA preparation and submission (see, for example, EA Report Section 4.2 and elsewhere). This included fisheries statistics and geospatial data up to 2007, with subsequent EA submissions and updates providing fisheries information up to 2013. Commercial fisheries data are provided by Fisheries and Oceans Canada (DFO) Statistical Services in Ottawa, ON, including geospatial information on the location and timing of fishing activity. The mapping information is currently provided by DFO as an aggregated data set which gives a general indication of fishing areas (by species, gear types, fleet and other pre-determined categories and data classes) for individual grid “cells” that are approximately 6 x 4 nautical miles in size. The DFO datasets record and report domestic and foreign fish harvests that are landed in Canada. The 2013 fisheries statistics and associated mapping (which were summarized in the previous 2015 EA Update for this Project) remained the most current available and received from DFO as of the time of preparation of this EA Update (J. Hosein, DFO Statistical Services, pers. comm.). The Operator has requested the 2014 fisheries data from DFO, which have just recently been processed and completed, and once received and analysed this updated information will be included in any future EA Updates for this Project.

The maps that follow provide an indication of the overall geographic distribution of commercial fishing activity within and adjacent to the Project Area for the years 2009 to 2013 (i.e., the most recent 5 years for which data are available) within the grid square system described above. This includes Figures that show all recorded commercial fishing activity, followed by gear types (fixed or mobile gear) and fishing areas for key species that were fished near the Project Area within that five year period.

As illustrated, the Project occurs well outside the more intensive commercial fishing areas elsewhere on the Banks and along the shelf, and the planned 2016 activities will not increase or otherwise change the nature or intensity of the Project’s potential interaction with fishing activities, locations and times.

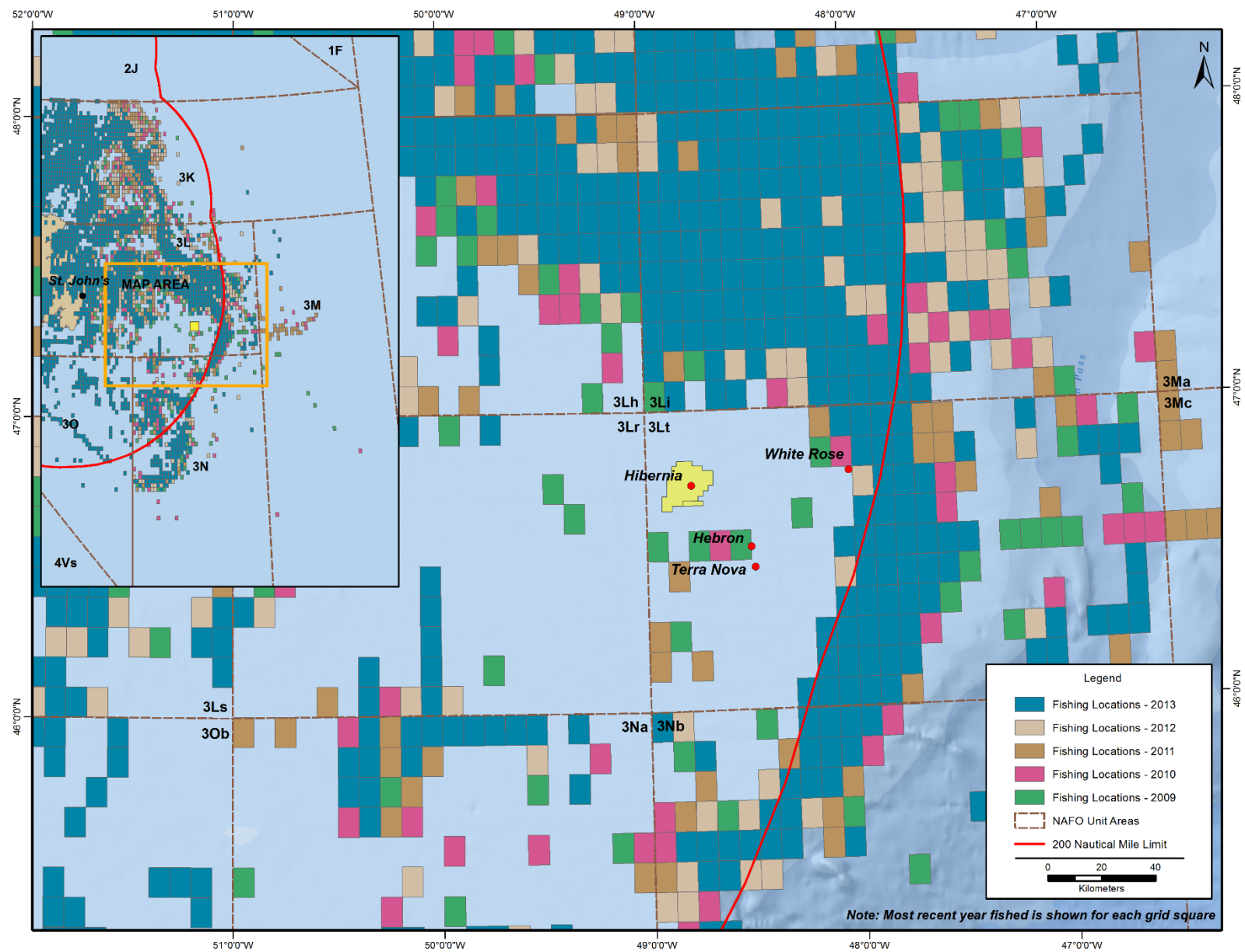
Figure 3.1 Commercial Fishing Locations, All Species

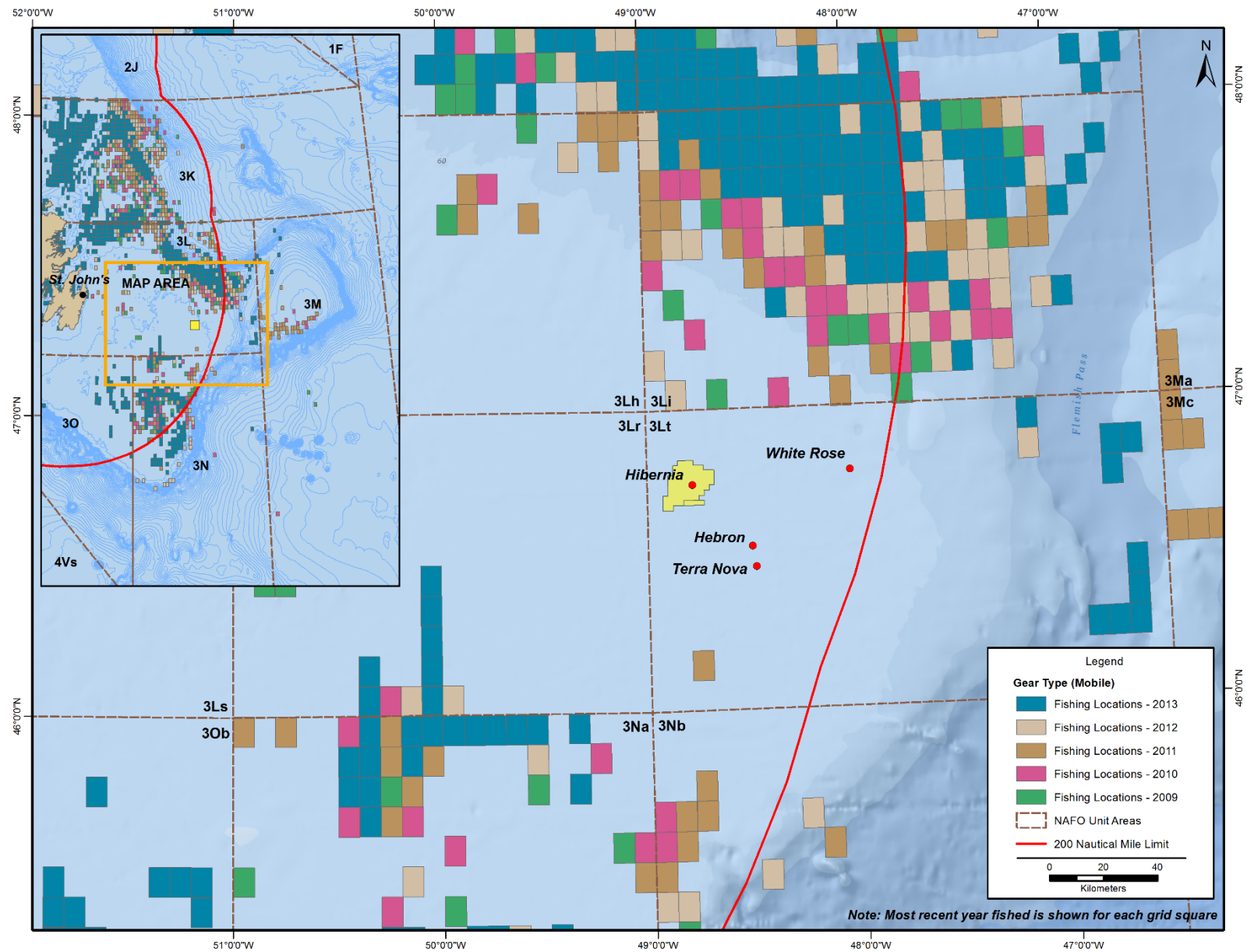
Figure 3.2 Commercial Fishing Locations, Mobile Gear Types

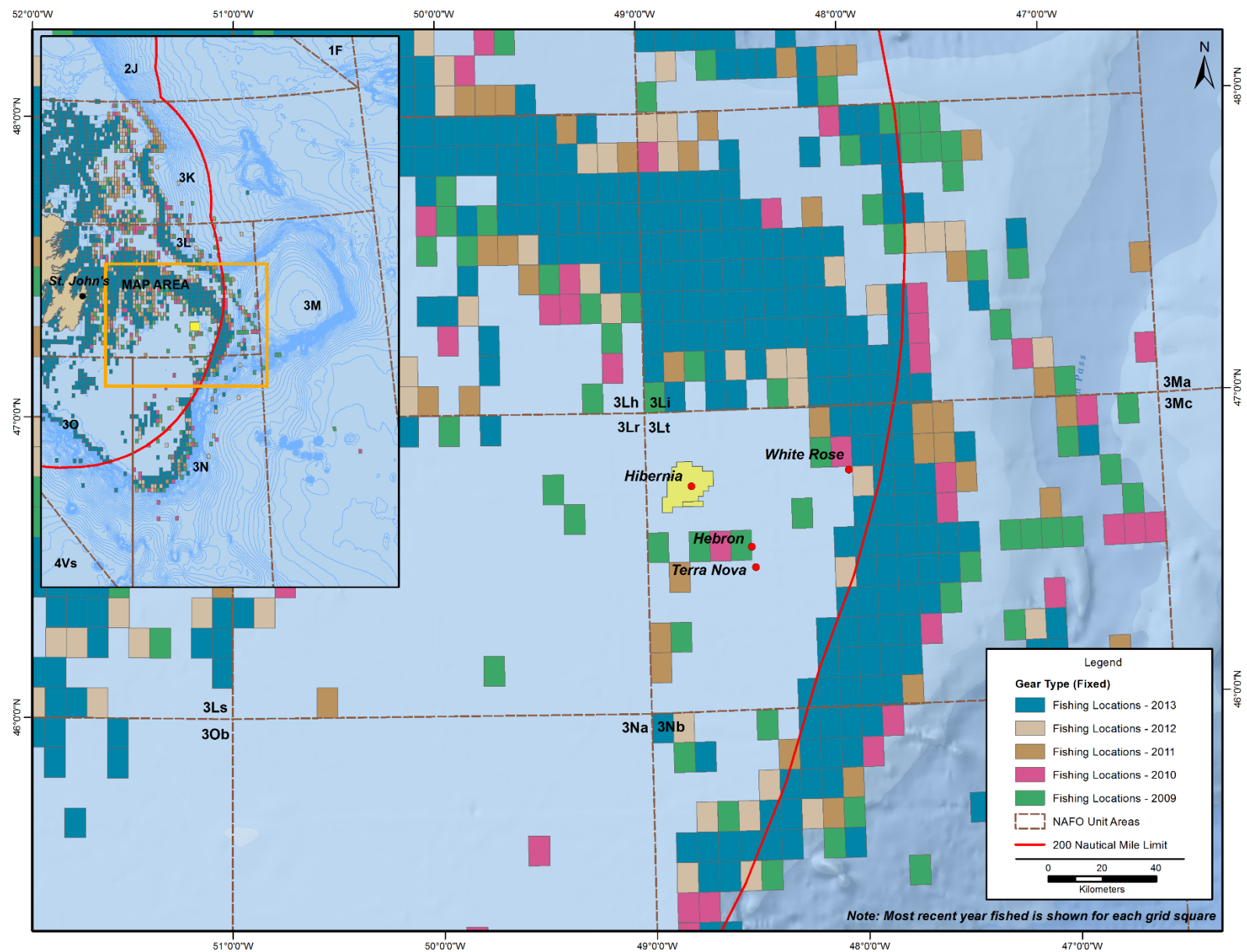
Figure 3.3 Commercial Fishing Locations, Fixed Gear Types

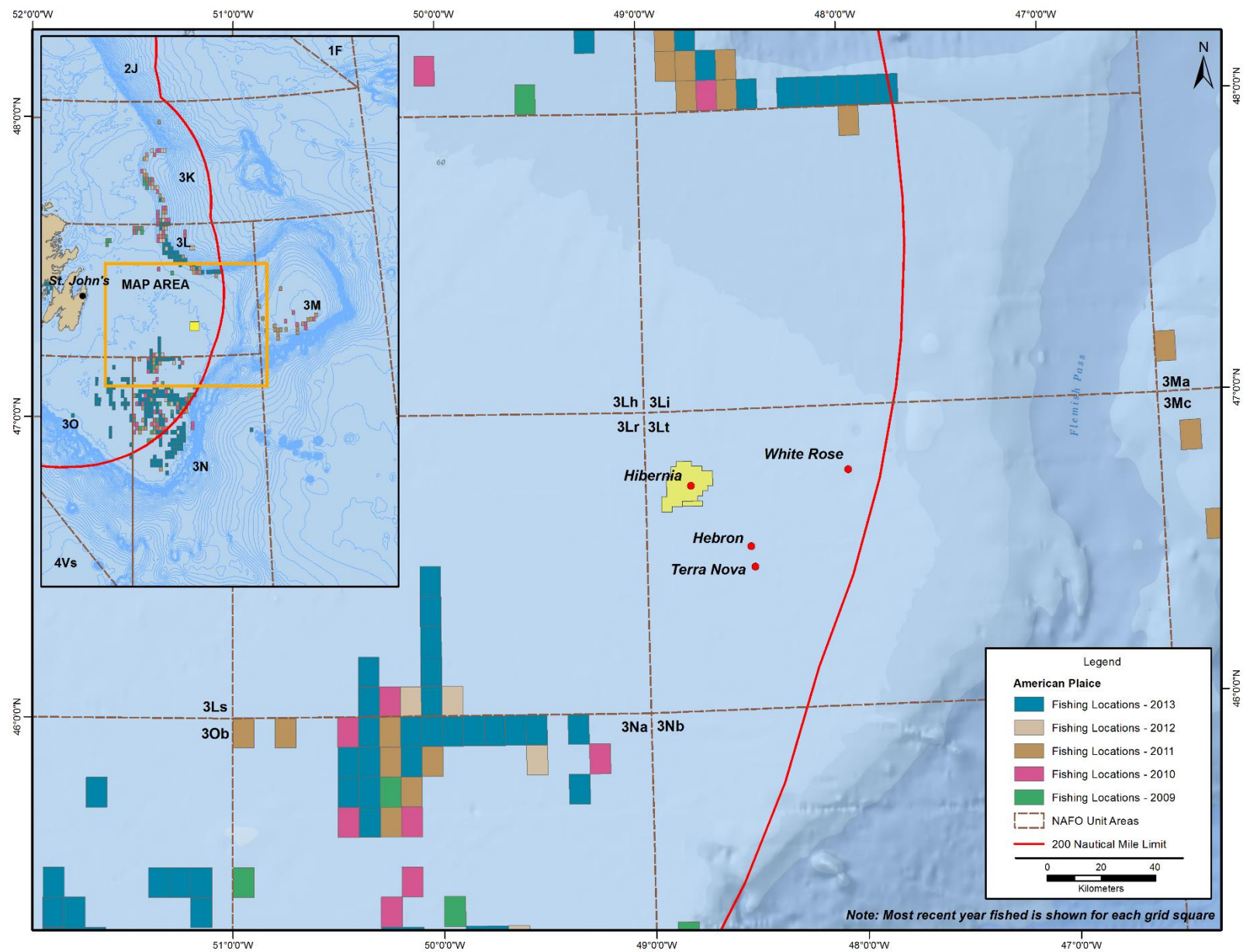
Figure 3.4 Commercial Fishing Locations, American Plaice

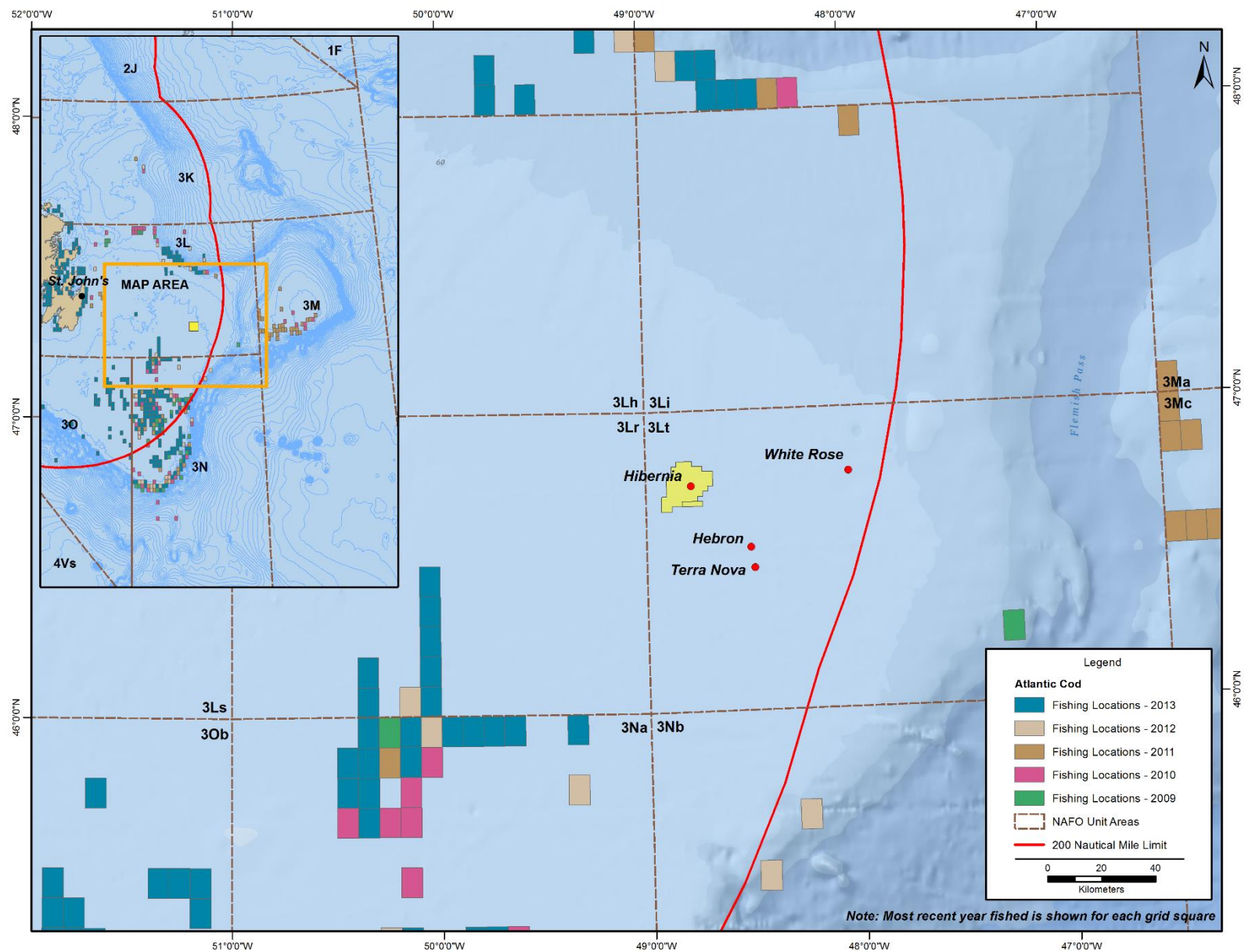
Figure 3.5 Commercial Fishing Locations, Atlantic Cod

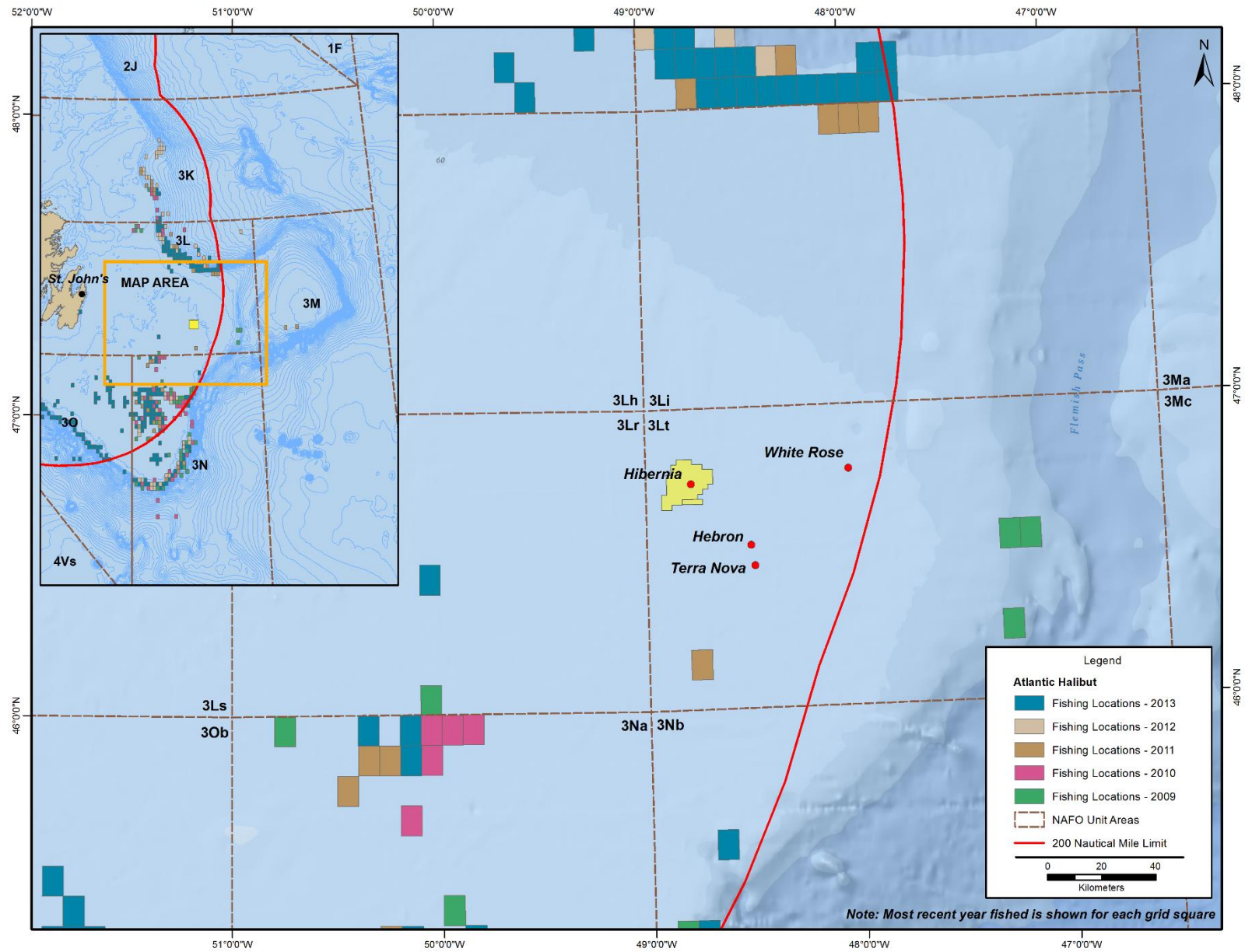
Figure 3.6 Commercial Fishing Locations, Atlantic Halibut

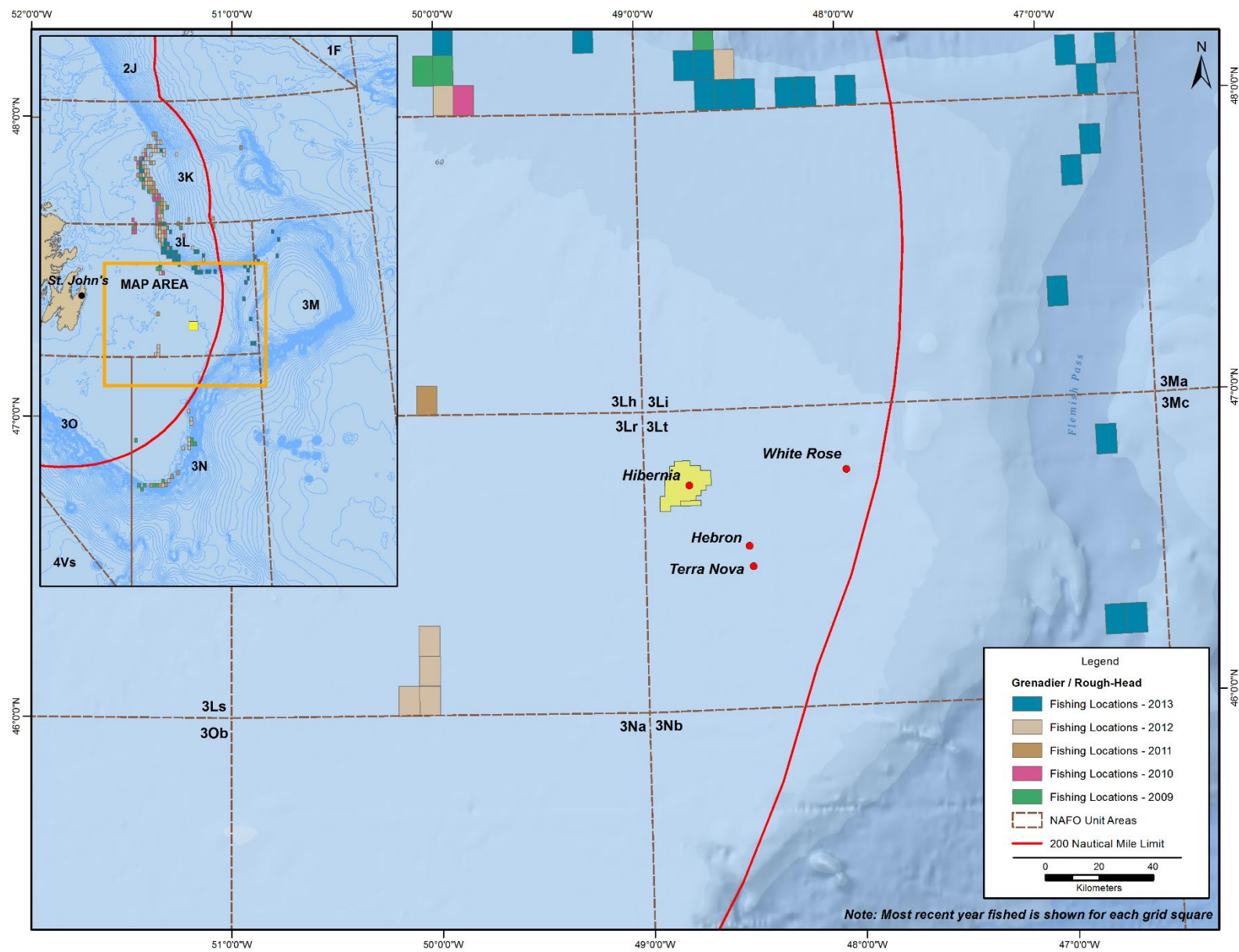
Figure 3.7 Commercial Fishing Locations, Rough-head Grenadier

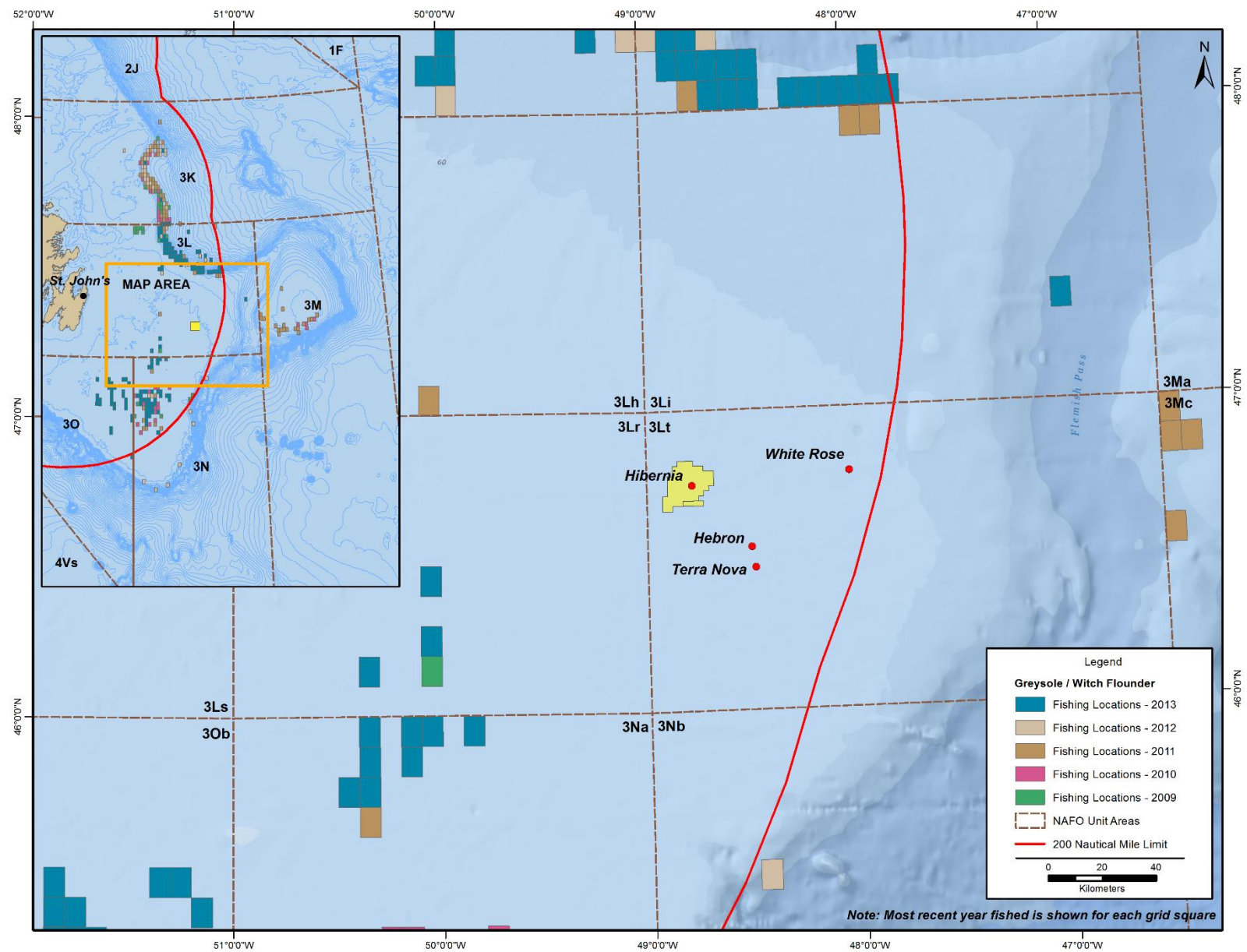
Figure 3.8 Commercial Fishing Locations, Greysole / Witch Flounder

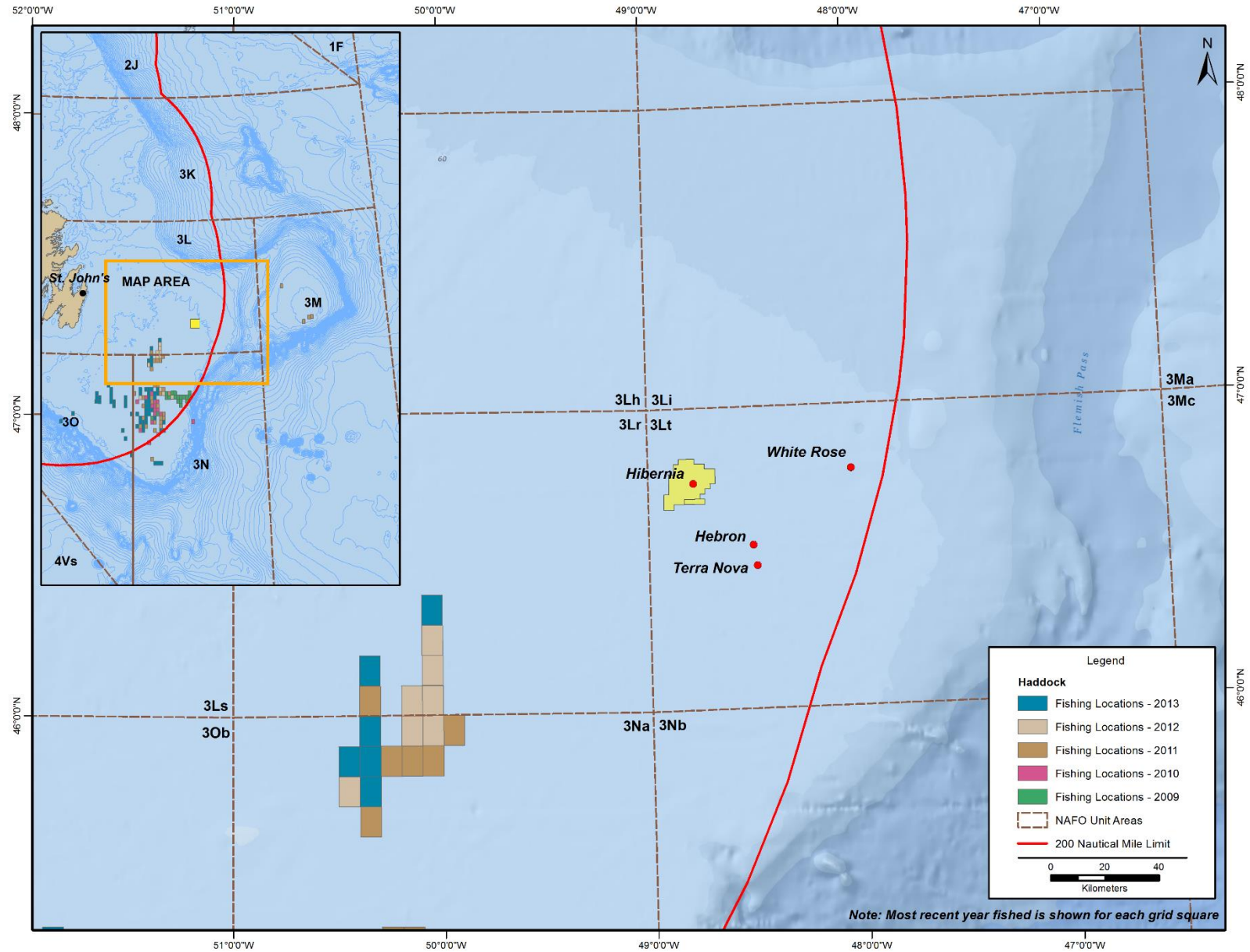
Figure 3.9 Commercial Fishing Locations, Haddock

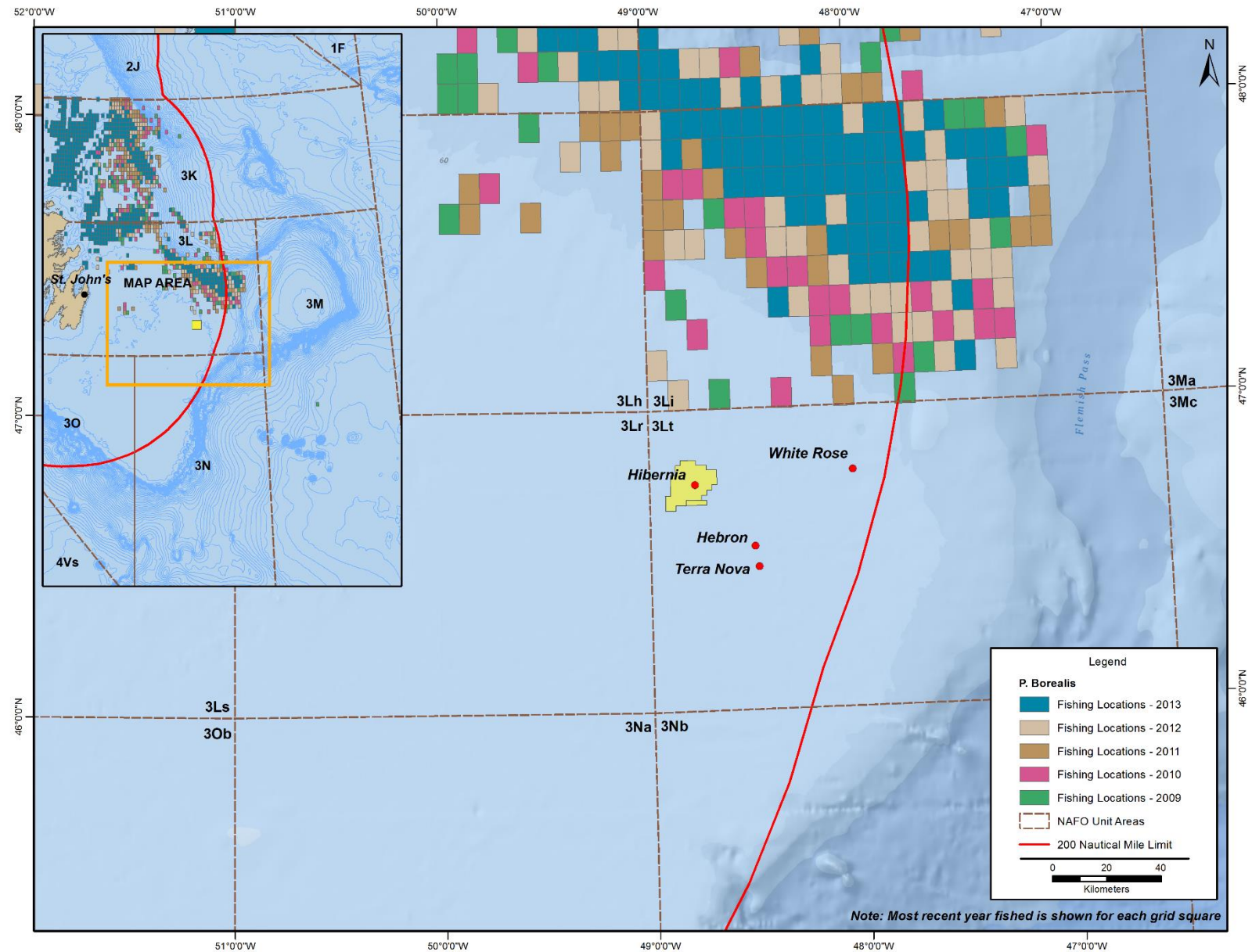
Figure 3.10 Commercial Fishing Locations, Northern Shrimp

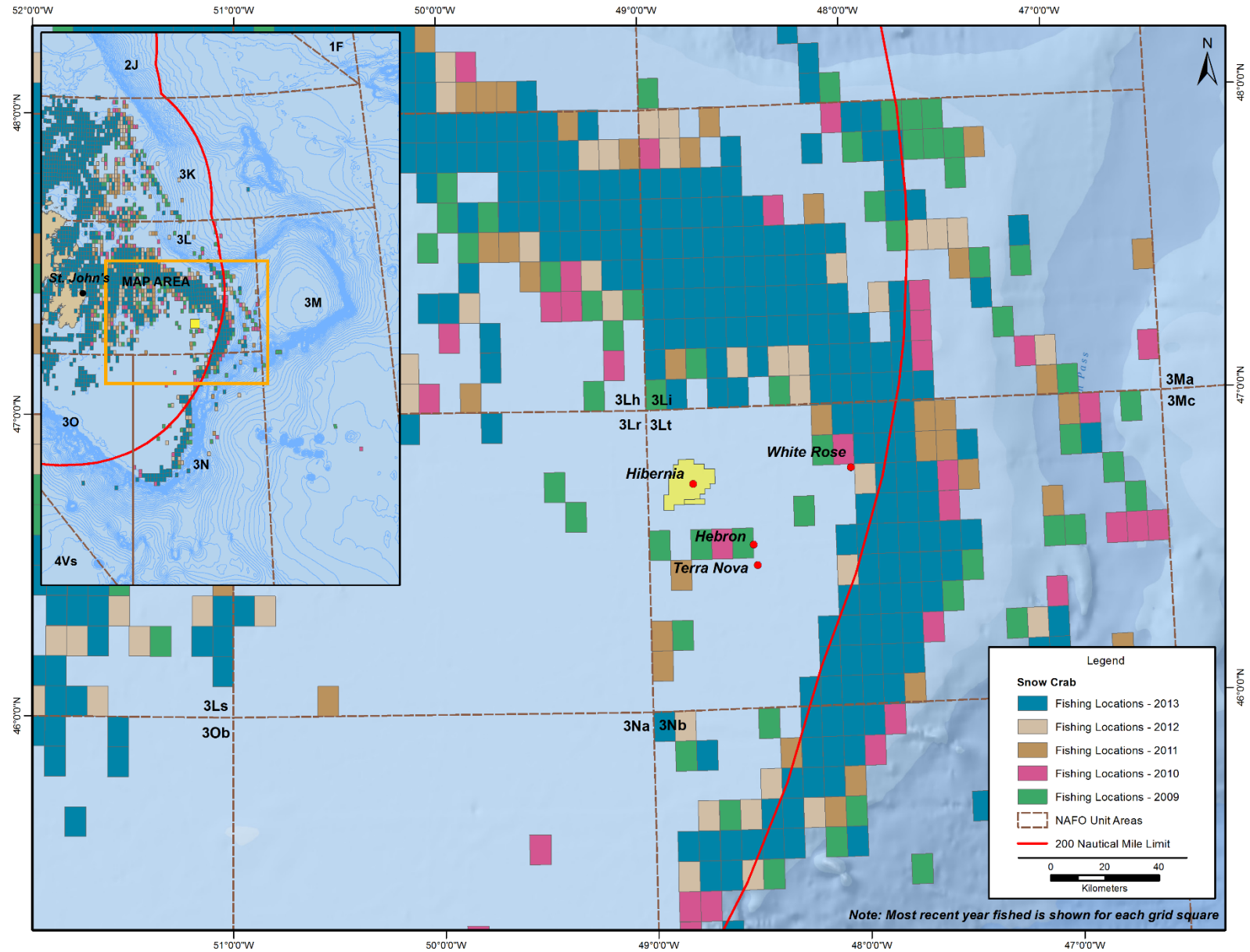
Figure 3.11 Commercial Fishing Locations, Snow Crab

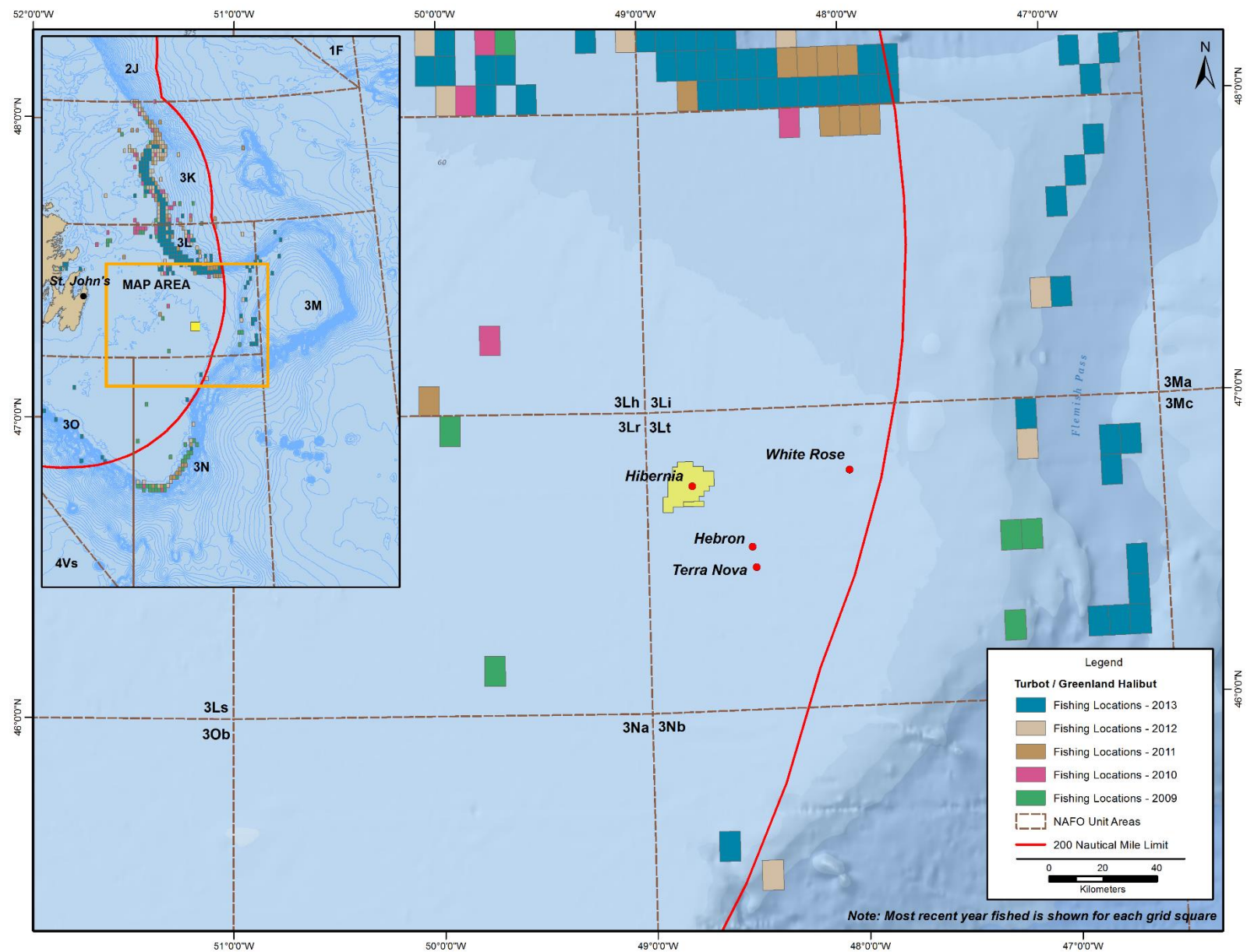
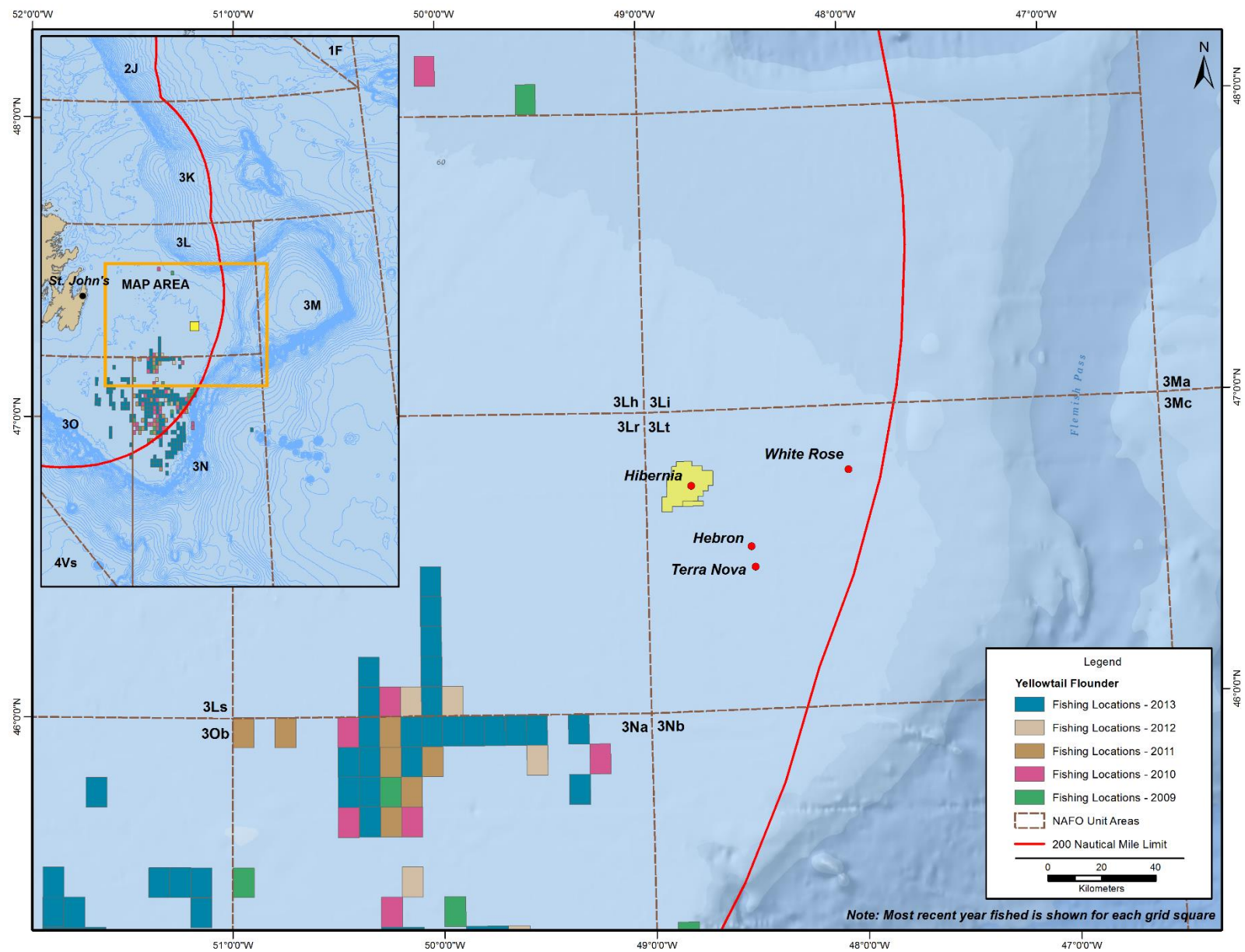
Figure 3.12 Commercial Fishing Locations, Turbot / Greenland Halibut

Figure 3.13 Commercial Fishing Locations, Yellowtail Flounder

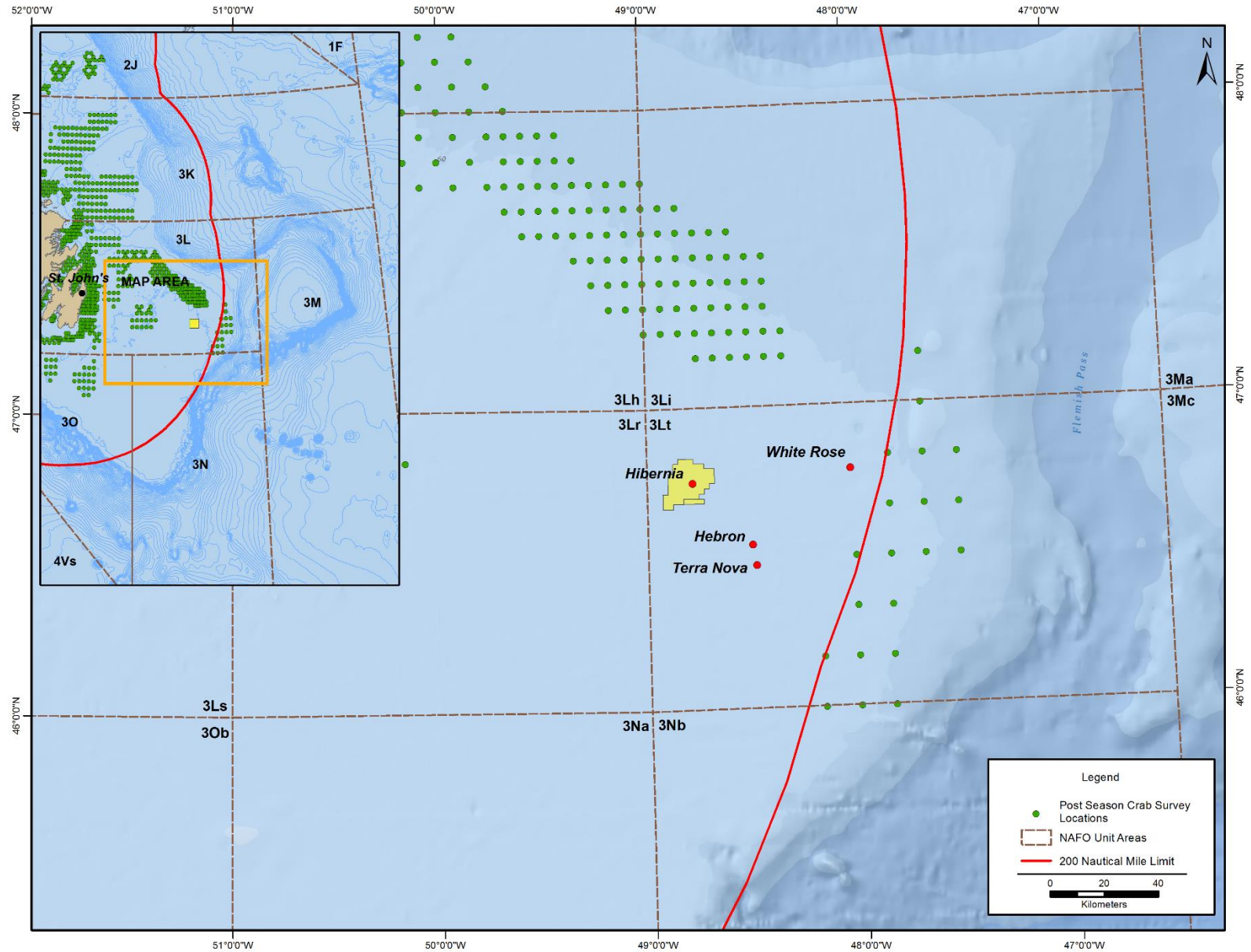
A number of fisheries survey programs by government and/or industry also occur in parts of the Eastern Newfoundland Offshore Area, including DFO Multispecies Research Vessel (RV) Trawl Surveys, which comprise annual (spring and fall) standardized bottom-trawl surveys to collect information for managing and monitoring fish resources in the Newfoundland and Labrador Region. Table 3.1 shows the 2016 schedule for DFO's surveys as recently obtained from DFO representatives (G. Sheppard, DFO – NL Region, personal communication).

Table 3.1 Planned Timing of DFO RV Surveys off Eastern Newfoundland (2016)

Vessel	Activity	NAFO Division	Tentative Start Date	Tentative End Date
CCGS Needler	NL Spring Survey	3P	March 29	April 12
		3P	April 12	April 26
		3P + 3O	April 27	May 10
		3O + 3N	May 10	May 21
		3L + 3N	May 24	June 10
			March 31	April 3
	Shellfish Survey		September 1	September 13
	NL Fall Survey	3O	September 14	September 27
		3O + 3N	September 27	October 8
		3N + 3L	October 11	October 25
		3L	October 25	November 8
		3K + 3L	November 9	November 19
			November 22	December 2
CCGS Teleost	NL Spring AZMP ¹	3L	April 5	April 26
	Capelin Survey	3P + 3KLMNO	April 27	May 2
	NL Spring AZMP ¹		July 8	July 28
	NL Fall Survey	2H	October 4	October 8
		2H+2J	October 11	October 25
		2J+3K	October 25	November 8
		3K	November 9	November 22
		3L+3L Deep	November 22	December 6
			December 7	December 20

¹ Atlantic Zone Monitoring Program
Source: G. Sheppard, DFO-NL (2016)

There is also an annual Industry - DFO Collaborative Post-season Trap Survey for snow crab in NAFO Divisions 2J3KLOPs4R, which is conducted using commercial and modified snow crab traps at established trap stations starting in late August or early September after the commercial snow crab season has ended (Figure 3.14). Recent discussions with DFO representatives indicate that while the detailed plans for the 2016 surveys are not yet available, at present there are no plans for any changes to the survey protocol for that year (D. Stansbury, DFO – NL, Shellfish Section, personal communication).

Figure 3.14 Locations of Industry - DFO Post-Season Snow Crab Survey Stations

3.2 Species at Risk

The Canadian *Species at Risk Act* (SARA) provides for the protection of species at the national level to prevent extinction and extirpation, facilitate the recovery of endangered and threatened species, and to promote the management of other species to prevent them from becoming at risk in the future. Designations under the Act follow the recommendations and advice provided by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

There are currently a number of schedules associated with the SARA. Species that have formal protection are listed on Schedule 1, which includes the following potential designations:

- *Extirpated*: A species that no longer exists in the wild in Canada, but exists elsewhere;
- *Endangered*: A species that is facing imminent extirpation or extinction;
- *Threatened*: A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction; and
- *Special Concern*: A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Schedule 1 of 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.

At the provincial level, the Newfoundland and Labrador *Endangered Species Act (NL ESA)* provides protection for indigenous species, sub-species and populations considered to be endangered, threatened, or vulnerable within the province. These potential designations under the legislation are defined as follows:

- *Endangered*: A species that is facing imminent extirpation or extinction;
- *Threatened*: A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction; and
- *Vulnerable*: A species that has characteristics which make it particularly sensitive to human activities or natural events.

Designations are based on recommendations from COSEWIC and/or the provincial Species Status Advisory Committee (SSAC). Habitat that is important to the recovery and survival of endangered or threatened species can also be designated as critical habitat or recovery habitat, and protected under the *NL ESA*.

The following Table provides a listing of identified species at risk, as identified and considered in the original EA and subsequent EA Updates (up to 2015), indicating their current designations under applicable legislation and by COSEWIC (no changes since the 2015 EA Update).

Table 3.2 Species at Risk or Otherwise of Special Conservation Concern (Current Designations)

Family	Species		Federal		Provincial
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	NL ESA
MARINE FISH					
Anarhichadidae	Atlantic wolffish	<i>Anarhichas lupus</i>	Special Concern	Special Concern	
Anarhichadidae	Northern wolffish	<i>Anarhichas denticulatus</i>	Threatened	Threatened	
Anarhichadidae	Spotted wolffish	<i>Anarhichas minor</i>	Threatened	Threatened	
Anguillidae	American eel	<i>Anguilla rostrata</i>		Threatened	Vulnerable
Carcharhinidae	Blue shark	<i>Prionace glauca</i>		Special Concern	
Cetorhinidae	Basking shark	<i>Cetorhinus maximus</i>		Special Concern	
Gadidae	Atlantic cod	<i>Gadus morhua</i>		Endangered	
Gadidae	Cusk	<i>Brosme</i>		Endangered	
Lamnidae	Porbeagle	<i>Lamna nasus</i>		Endangered	
Lamnidae	Shortfin mako	<i>Isurus oxyrinchus</i>		Threatened	
Lamnidae	White shark	<i>Carcharodon carcharias</i>	Endangered	Endangered	
Macrouridae	Roughhead grenadier	<i>Macrourus berglax</i>		Special Concern	
Macrouridae	Roundnose grenadier	<i>Coryphaenoides rupestris</i>		Endangered	
Phycidae	White hake	<i>Urophycis tenuis</i>		Threatened	
Pleuronectidae	American plaice	<i>Hippoglossoides platessoides</i>		Threatened	
Rajidae	Smooth skate	<i>Malacoraja senta</i>		Endangered	
Rajidae	Thorny skate	<i>Amblyraja radiata</i>		Special Concern	
Salmonidae	Atlantic salmon – Newfoundland population	<i>Salmo salar</i>		Threatened	
Scombridae	Atlantic bluefin tuna	<i>Thunnus thynnus</i>		Endangered	
Scorpaenidae	Acadian redfish	<i>Sebastes fasciatus</i>		Threatened	
Scorpaenidae	Deepwater redfish	<i>Sebastes mentella</i>		Threatened	
Squalidae	Spiny dogfish	<i>Squalus acanthias</i>		Special Concern	
MARINE BIRDS					
Laridae	Ivory Gull	<i>Pagophila eburnea</i>	Endangered	Endangered	Endangered
Scolopacidae	Red-necked Phalarope	<i>Phalaropus lobatus</i>		Special Concern	

Family	Species		Federal		Provincial
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	NL ESA
MARINE MAMMALS AND SEA TURTLES					
Balaenopteridae	Blue Whale - Atlantic Population	<i>Balaenoptera musculus</i>	Endangered	Endangered	
Balaenopteridae	Fin Whale - Atlantic Population	<i>Balaenoptera physalus</i>	Special Concern	Special Concern	
Balaenidae	North Atlantic Right Whale	<i>Eubalaena glacialis</i>	Endangered	Endangered	
Ziphiidae	Northern Bottlenose Whale - Davis Strait, Baffin Bay, Labrador Sea population; Scotian Shelf population	<i>Hyperoodon ampullatus</i>	Endangered (Scotian Shelf population)	Special Concern (Davis Strait, Baffin Bay, Labrador Sea population); Endangered (Scotian Shelf population)	
Ziphiidae	Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>	Special Concern	Special Concern	
Delphinidae	Killer Whale (Northwest Atlantic / Eastern Arctic population)	<i>Orcinus orca</i>		Special Concern	
Phocoenidae	Harbour Porpoise (Northwest Atlantic population)	<i>Phocoena phocoena</i>		Special Concern	
Dermochelyidae	Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	Endangered	
Cheloniidae	Loggerhead Sea Turtle	<i>Caretta caretta</i>		Endangered	

The planned 2016 activities associated with the Project are located within the previously defined and considered Project Area (and the associated EA Study Area), and will therefore not result in any increases or other changes in the Project's potential to interact with, or have negative effects upon, key or particularly sensitive species (including any that are designated as being species at risk) or habitats.

3.3 Applicability of Associated Environmental Effects Analysis and Identified Mitigation

The planned 2016 activities associated with the Project (as described earlier in this document) are again in keeping with the nature and scope of the Project as described, assessed and approved under the EA process for the Project.

Each of the environmental issues, potential effects and associated mitigations measures (as reflected in the EA Report and subsequent EA submissions) therefore remain applicable to the nature and scope of the planned 2016 Project activities, including with regard to addressing any potential effects on species at risk and other marine biota and marine activities (including fisheries).

These mitigations will continue to be implemented in accordance with HMDC's commitments and obligations pursuant to the Project's EA approval and other applicable legislative and regulatory requirements.