

ENVIRONMENTAL ASSESSMENT UPDATE: Hibernia Project Operations 2017

FINAL REPORT

Submitted by:

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1 INTRODUCTION

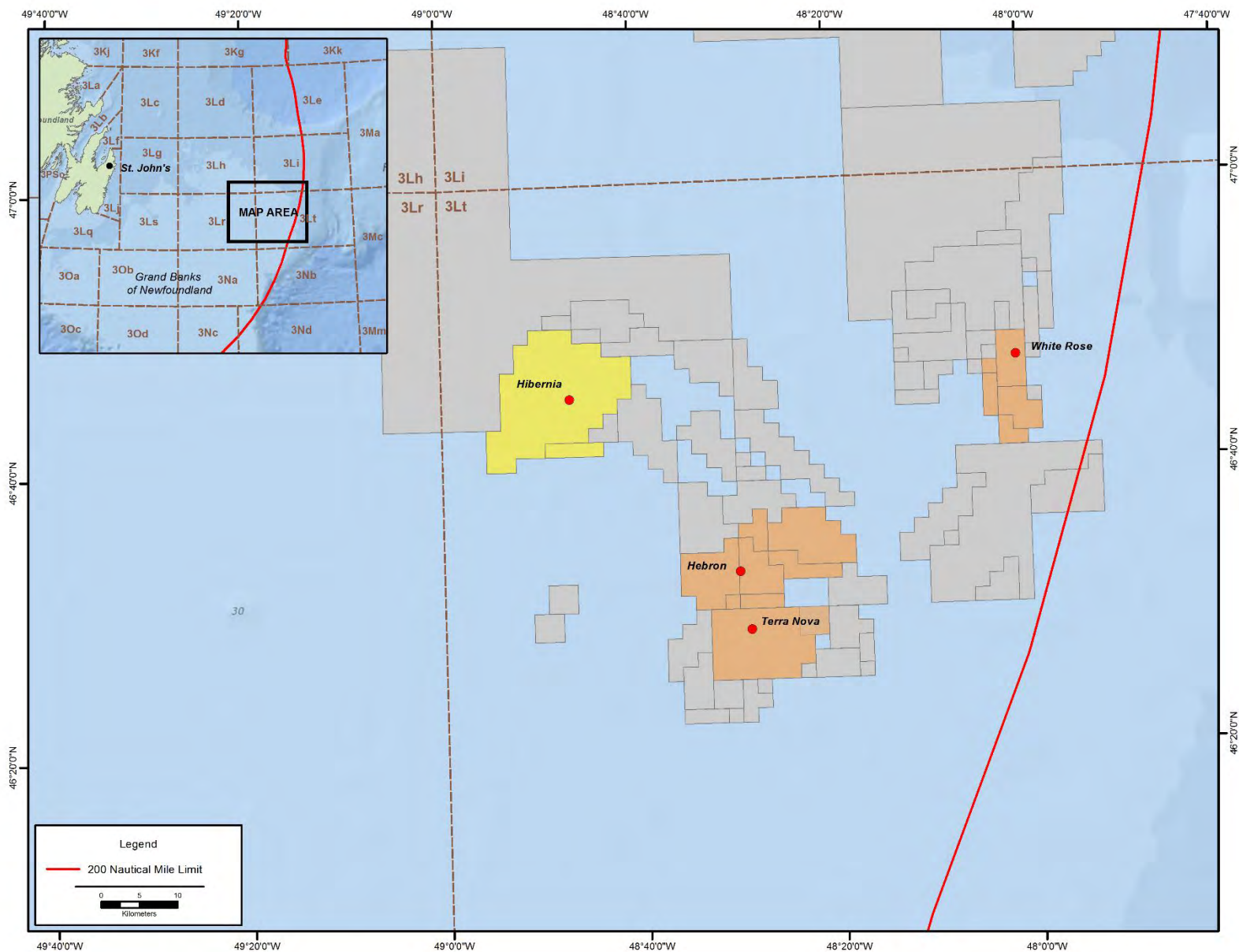
The Hibernia oil field is located offshore Newfoundland and Labrador, Canada in the Jeanne d'Arc Basin which underlies the northwestern portion of the Grand Banks, approximately 315 kilometres east-southeast of St. John's (Figure 1.1). The oil field was first discovered in 1979, and consists of two principal 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 2016, 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 2017 EA Update for the Hibernia Project Operations.

Figure 1.1 Project Area



2 PROJECT DESCRIPTION (PLANNED 2017 ACTIVITIES)

In 2017, normal drilling and production operations will continue as usual on the Hibernia platform. Drilling operations utilizing the West Aquarius Mobile Offshore Drilling Unit (MODU) will be completed at the HSE location early in the second quarter of 2017.

2.1 Subsea Work – Hibernia South Extension and Unit Ben Nevis Avalon

Commissioning of six subsea water injection wells (P-02 3, P-02 4, P-02 5, P-02 6, P-02 7 and P-02 8) was performed in 2016. Four of the water injection wells are active water injectors supporting HSE producers and two will support future Unit Ben Nevis Avalon (UBNA) producers. Planned for 2017 is the commissioning of P-02 9 following drilling and completion activities, and the re-commissioning of P-02 7 following workover operations. 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 MODU.

2.2 Drilling

In 2016 the West Aquarius MODU drilled and completed wells P-02 3, P-02 5, P-02 7, P-02 8, and P-02 6. Drilling operations also commenced on P-02 9 and will continue into 2017. During 2017, HMDC plans to drill and complete P-02 9, perform a workover on P-02 7 and if time allows prior to the end of the West Aquarius rig contract, to drill the two riserless hole sections of the last remaining slot in the Excavated Drill Center (EDC). Riser-connected drilling of P-02 9 (444.5 mm, 311 mm and 216 mm) will use non-aqueous drilling fluid and any riserless sections (1,067 mm and 660 mm) will be drilled with water-based fluids.

The subsea cuttings management equipment that would be used in 2017 for any riserless drilling is the same equipment as used previously. The enhanced drilling (formerly known as AGR) subsea cuttings management system would be used during any riserless drilling or cementing operations in 2017 (1067 mm hole, 914 mm casing cement, 660 mm hole, 508 mm casing cement). The subsea pump will remove cuttings or any cement returns away from the wellbore and distribute them outside the EDC via an approximately 100 m long discharge hose.

The West Aquarius drilling contract will be completed in early Q2 2017. Upon completion of the above mentioned drilling and completion activities, the West Aquarius will pull anchors and demobilize from the HSE location.

2.3 Consultations

As part of its on-going operations and activities associated with the Hibernia Project, 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 2017 activities that are described in this EA Update will be communicated to and discussed with these groups through the above described forums.

2.4 Planned 2017 Activities in Relation to the Overall Project and EA Scope

The planned 2017 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 / infrastructure and associated activities that would be associated with the drilling of wells, both production and injection (Section 2.1.2), subsea equipment installation (Section 2.1.4), 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 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 2017 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 Canada-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. Fisheries mapping data for up to 2015 has recently been provided by DFO.

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 2011 to 2015 (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, and which have been considered and mapped in previous EA Updates.

As illustrated, the Project occurs well outside the more intensive commercial fishing areas elsewhere on the Banks and along the shelf, and the planned 2017 activities will not increase or otherwise change the nature or intensity of the Project’s potential interaction with fishing activities, locations and times.

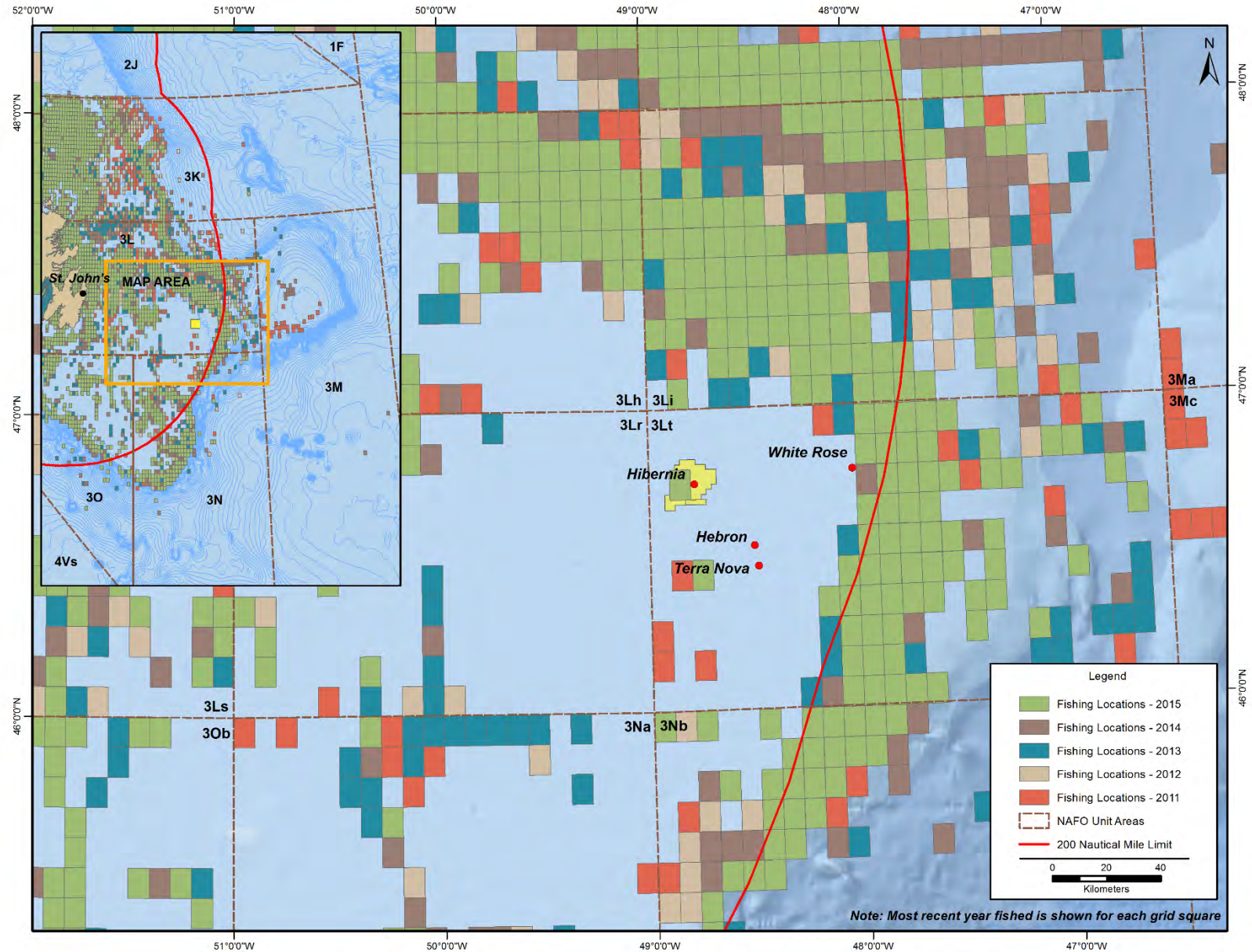
Figure 3.1 Commercial Fishing Locations, All Species (2011-2015)

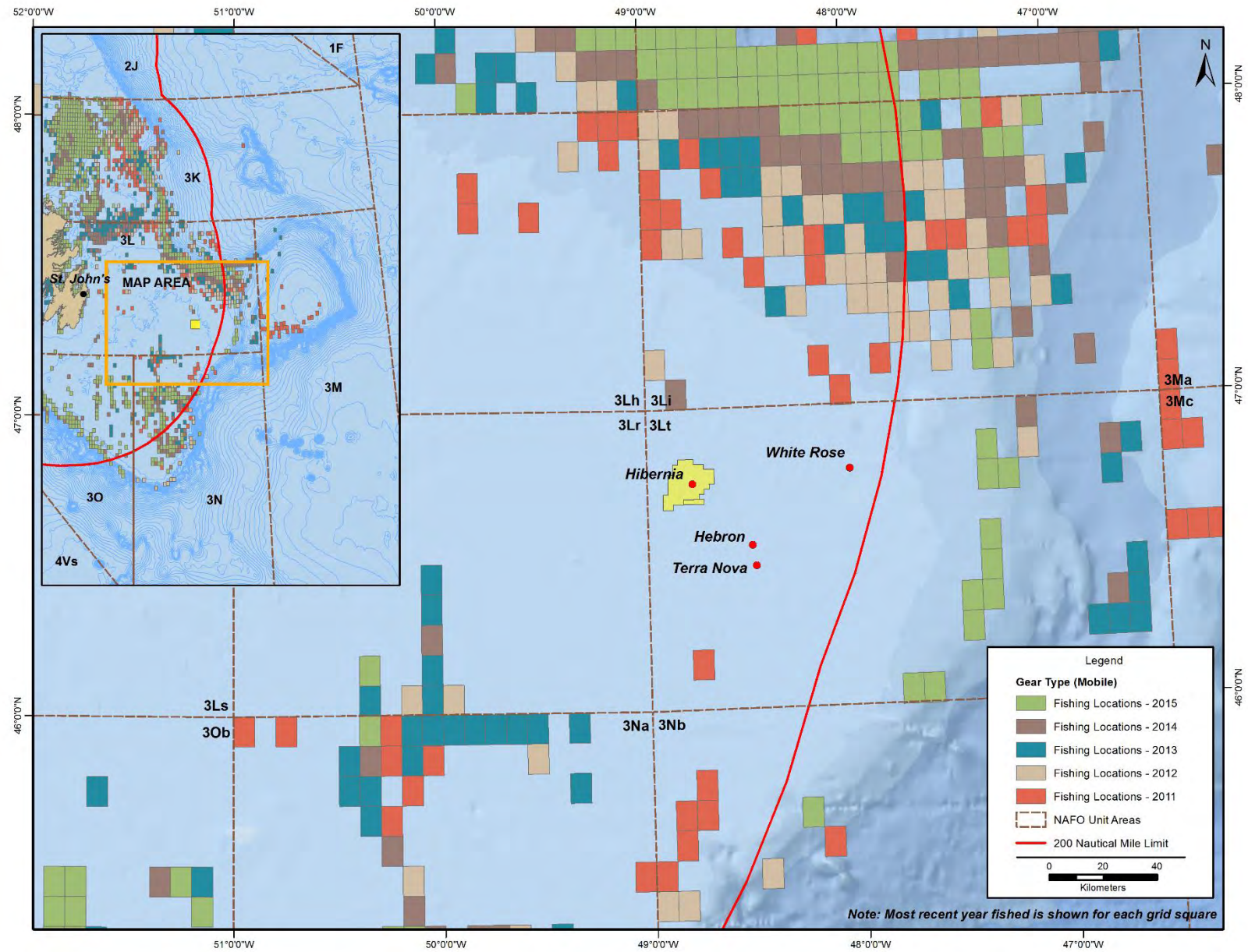
Figure 3.2 Commercial Fishing Locations, Mobile Gear Types (2011-2015)

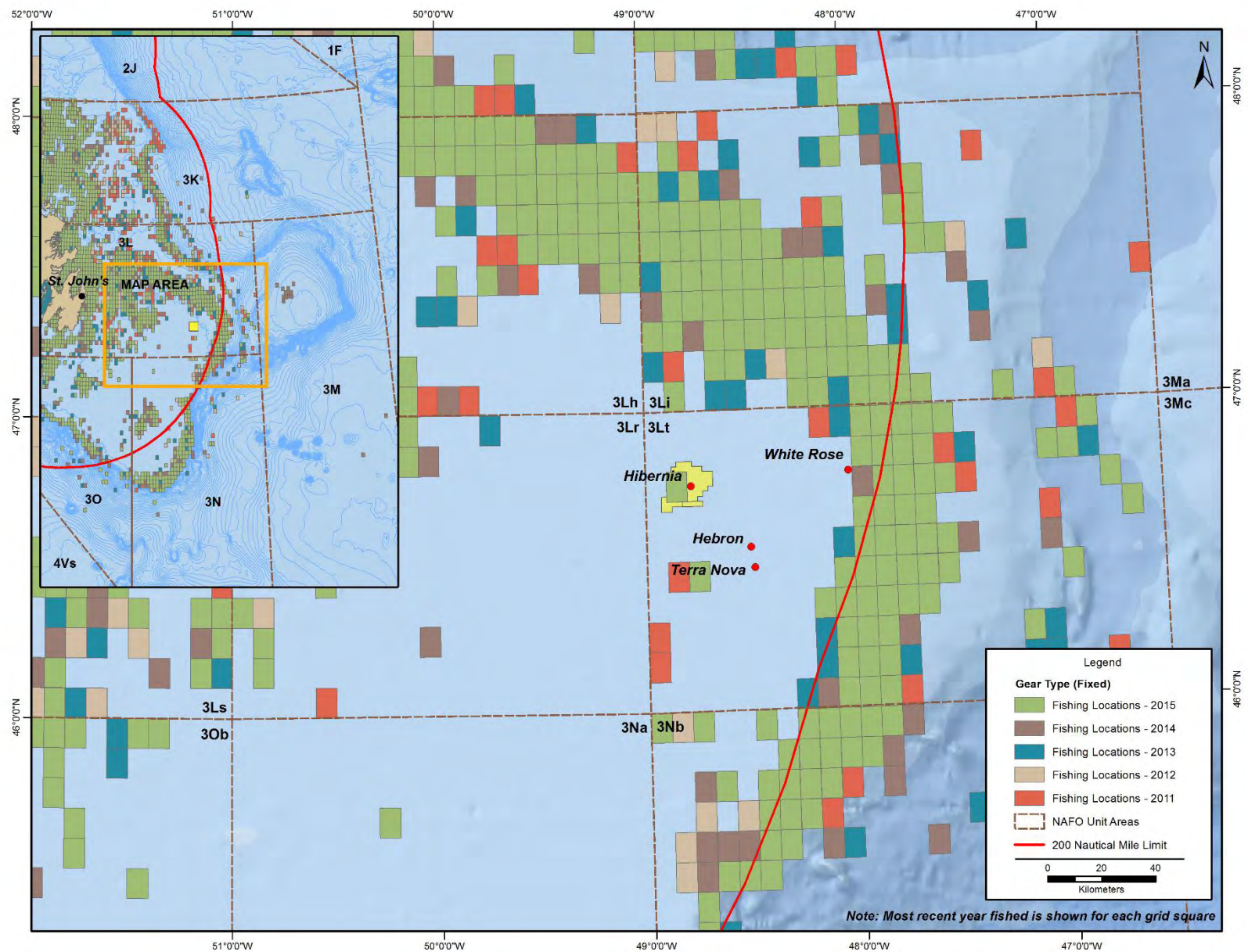
Figure 3.3 Commercial Fishing Locations, Fixed Gear Types (2011-2015)

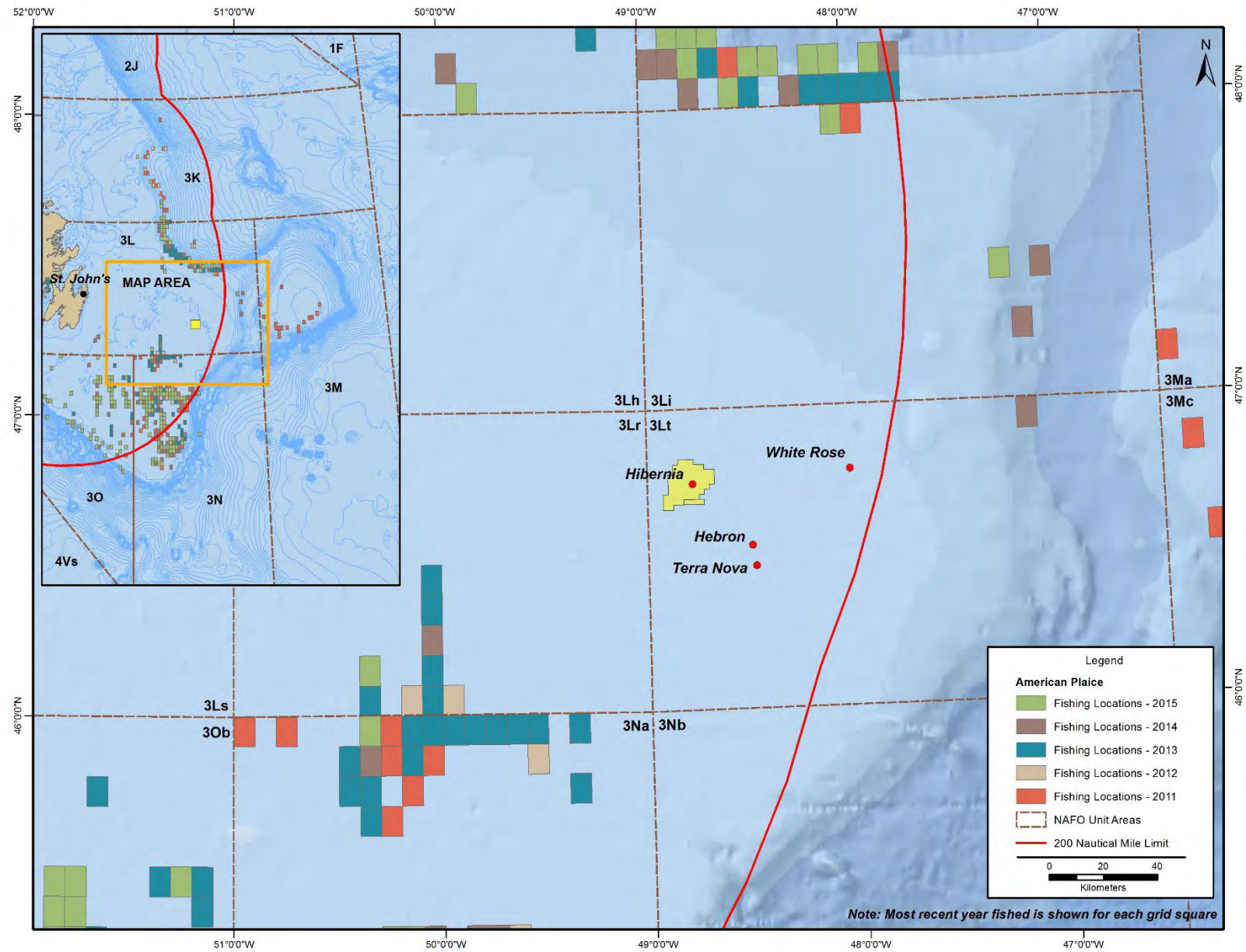
Figure 3.4 Commercial Fishing Locations, American Plaice (2011-2015)

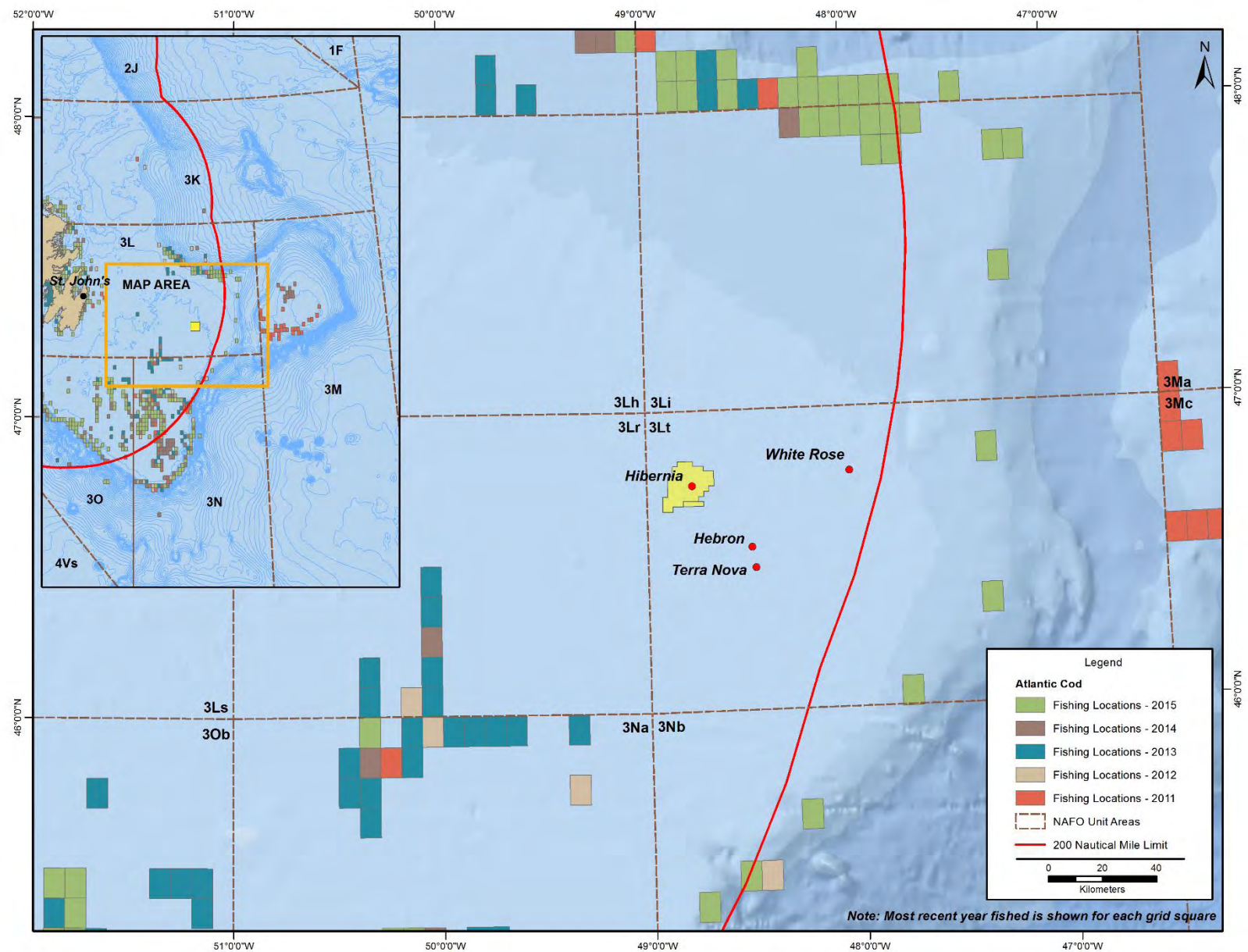
Figure 3.5 Commercial Fishing Locations, Atlantic Cod (2011-2015)

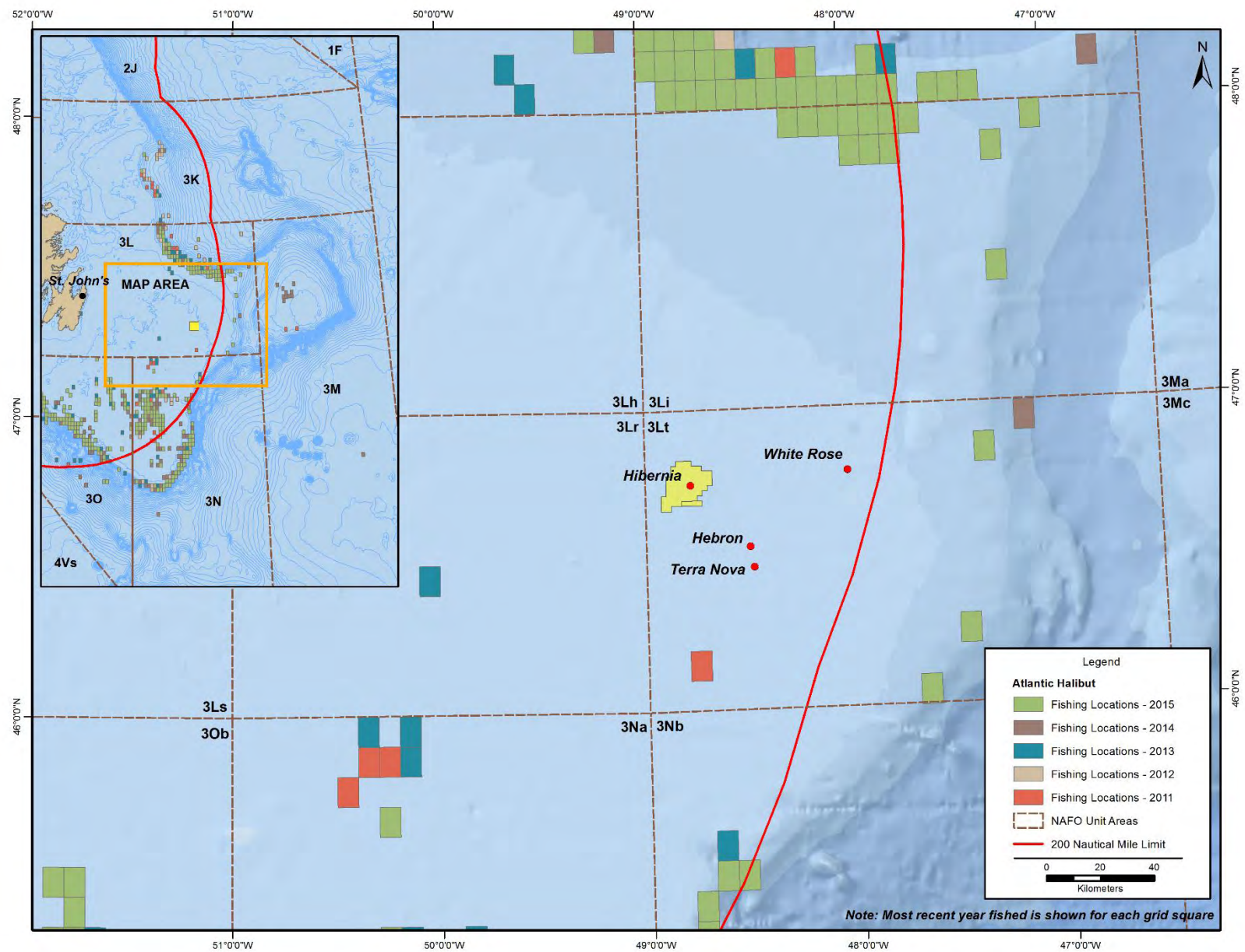
Figure 3.6 Commercial Fishing Locations, Atlantic Halibut (2011-2015)

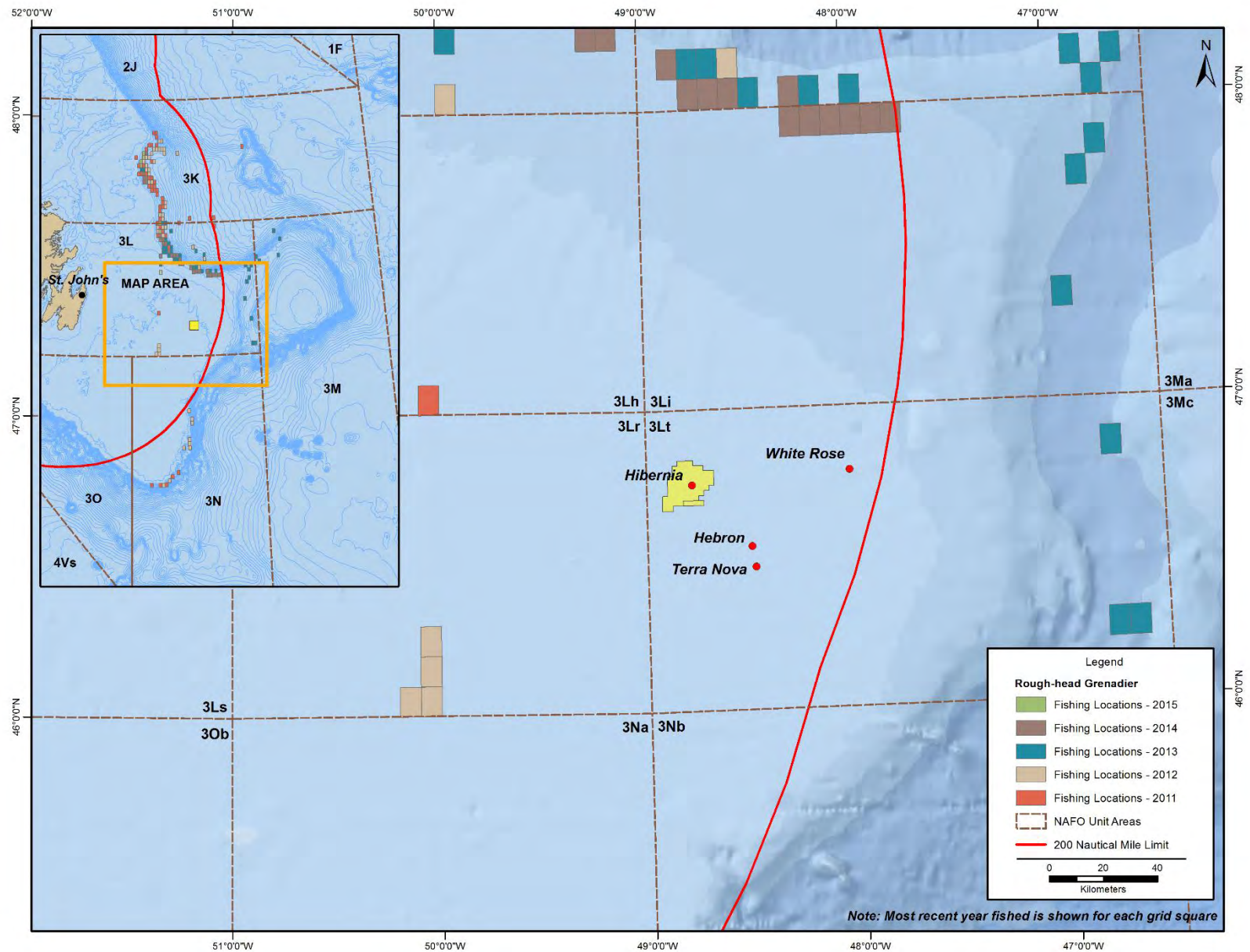
Figure 3.7 Commercial Fishing Locations, Rough-head Grenadier (2011-2015)

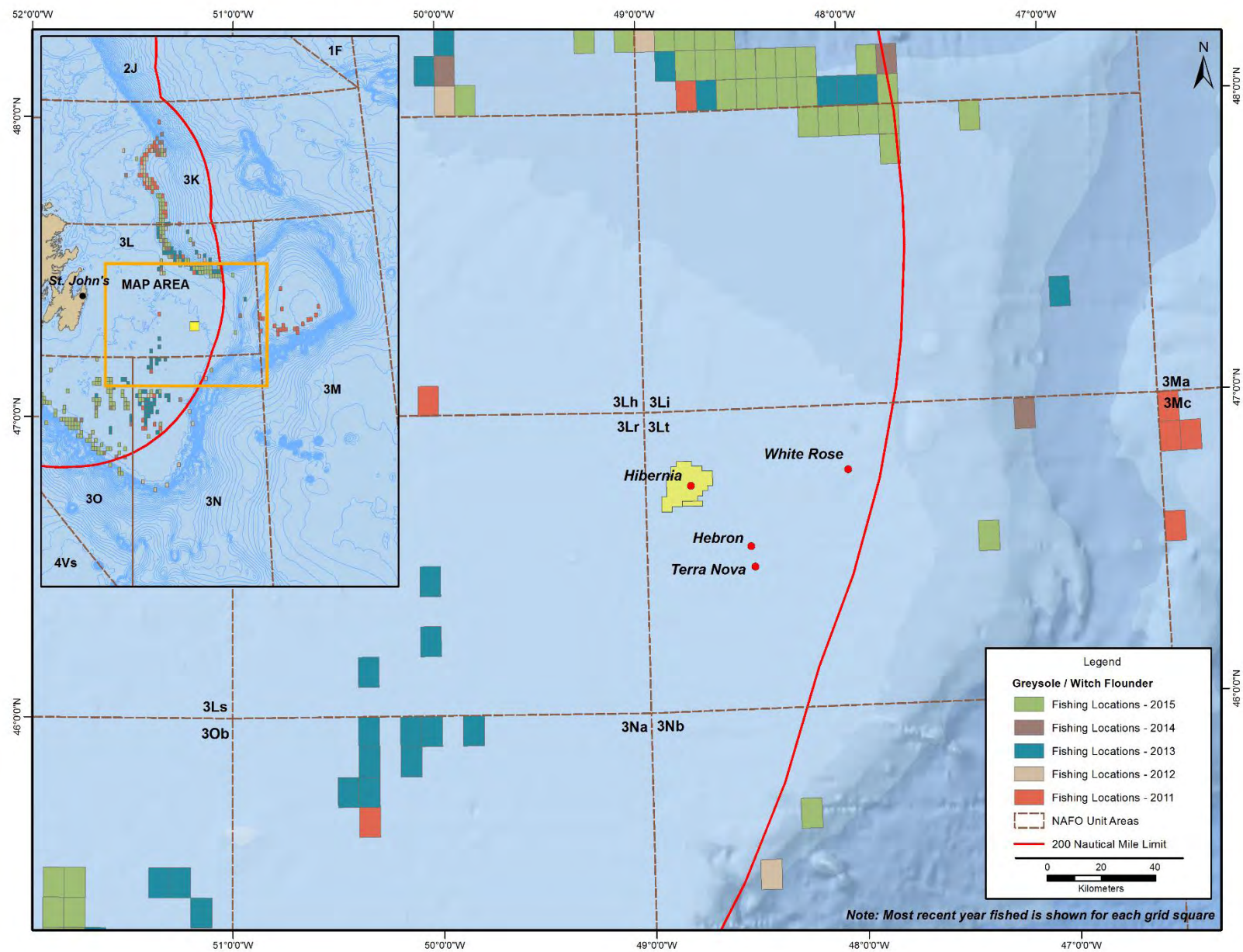
Figure 3.8 Commercial Fishing Locations, Greysole / Witch Flounder (2011-2015)

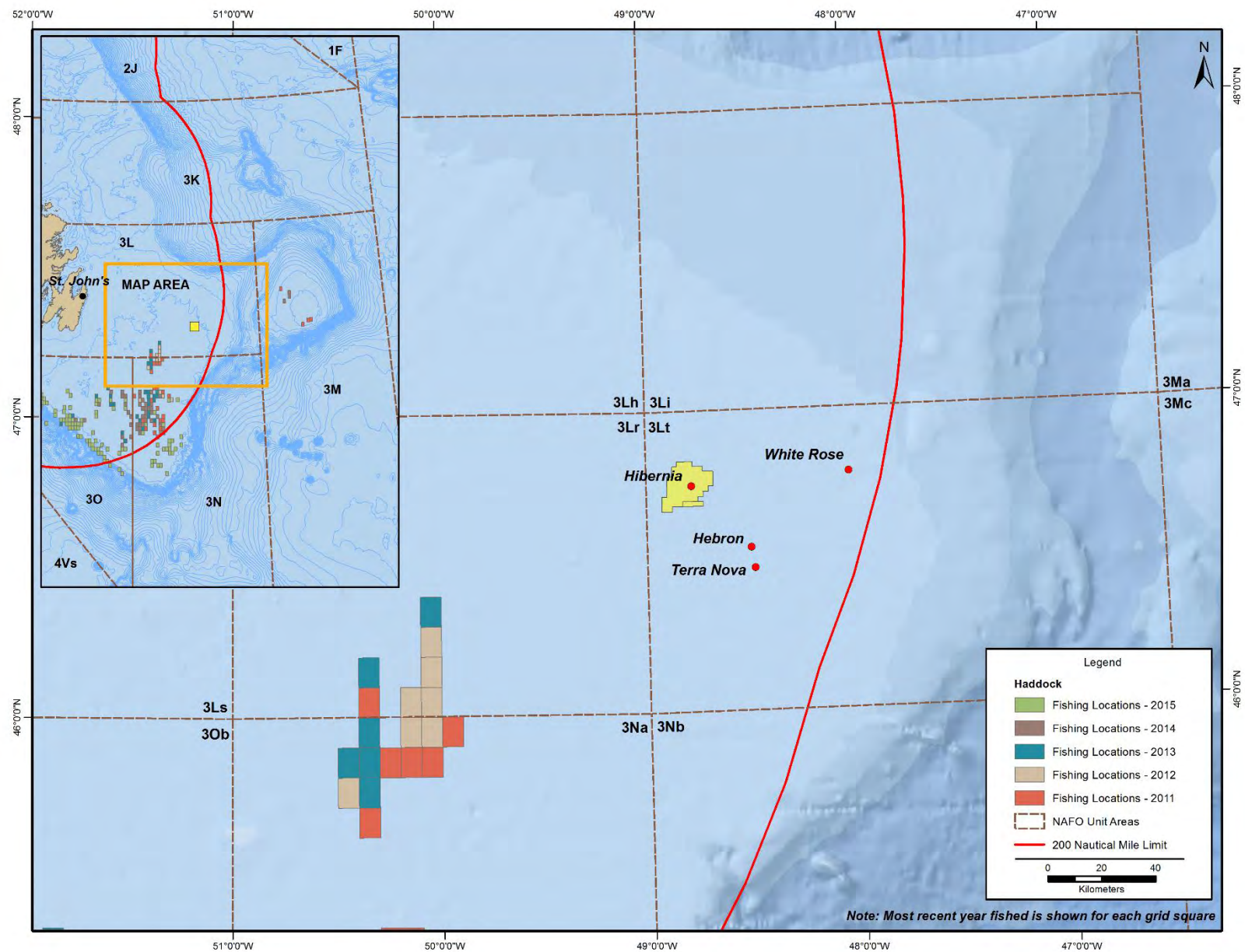
Figure 3.9 Commercial Fishing Locations, Haddock (2011-2015)

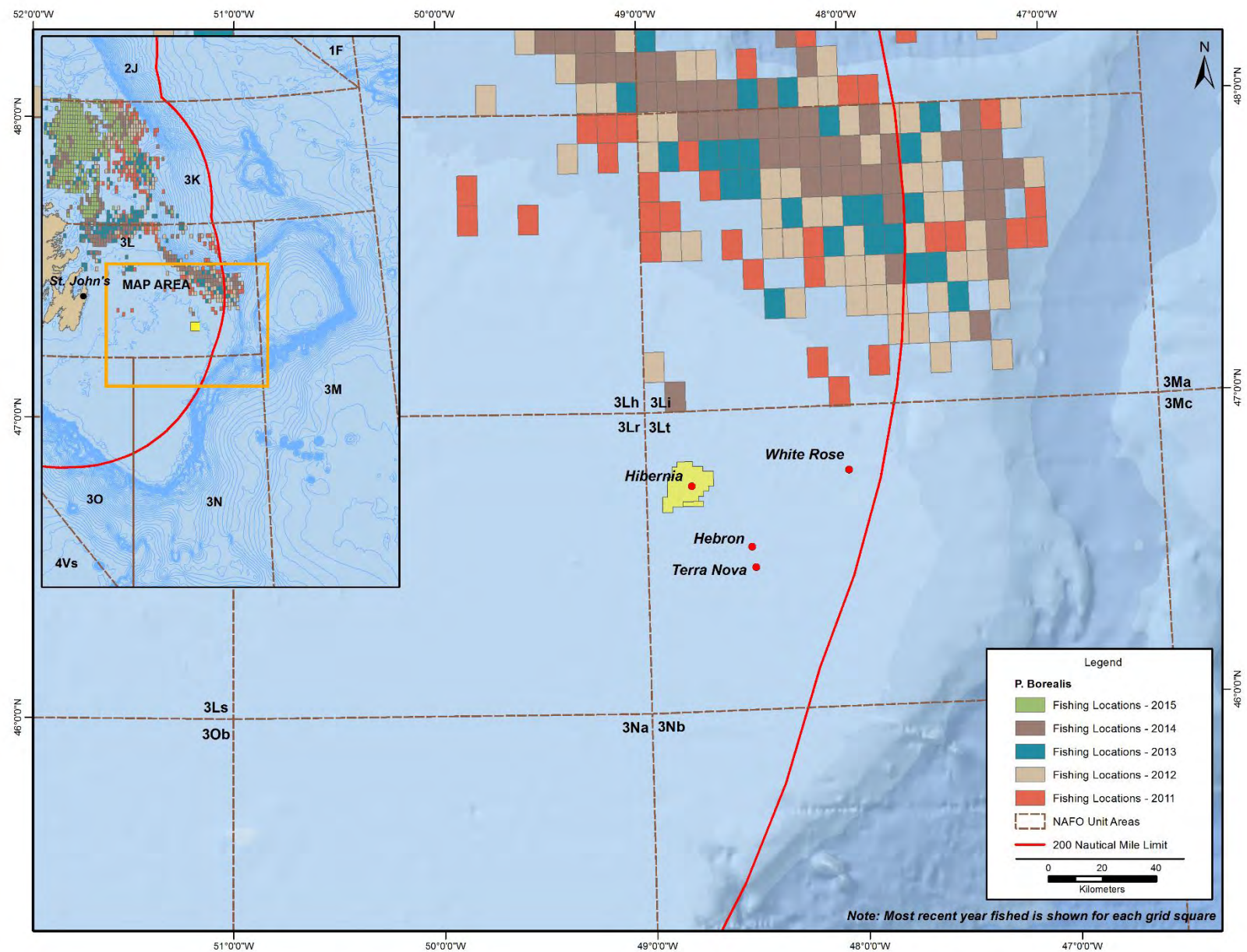
Figure 3.10 Commercial Fishing Locations, Northern Shrimp (2011-2015)

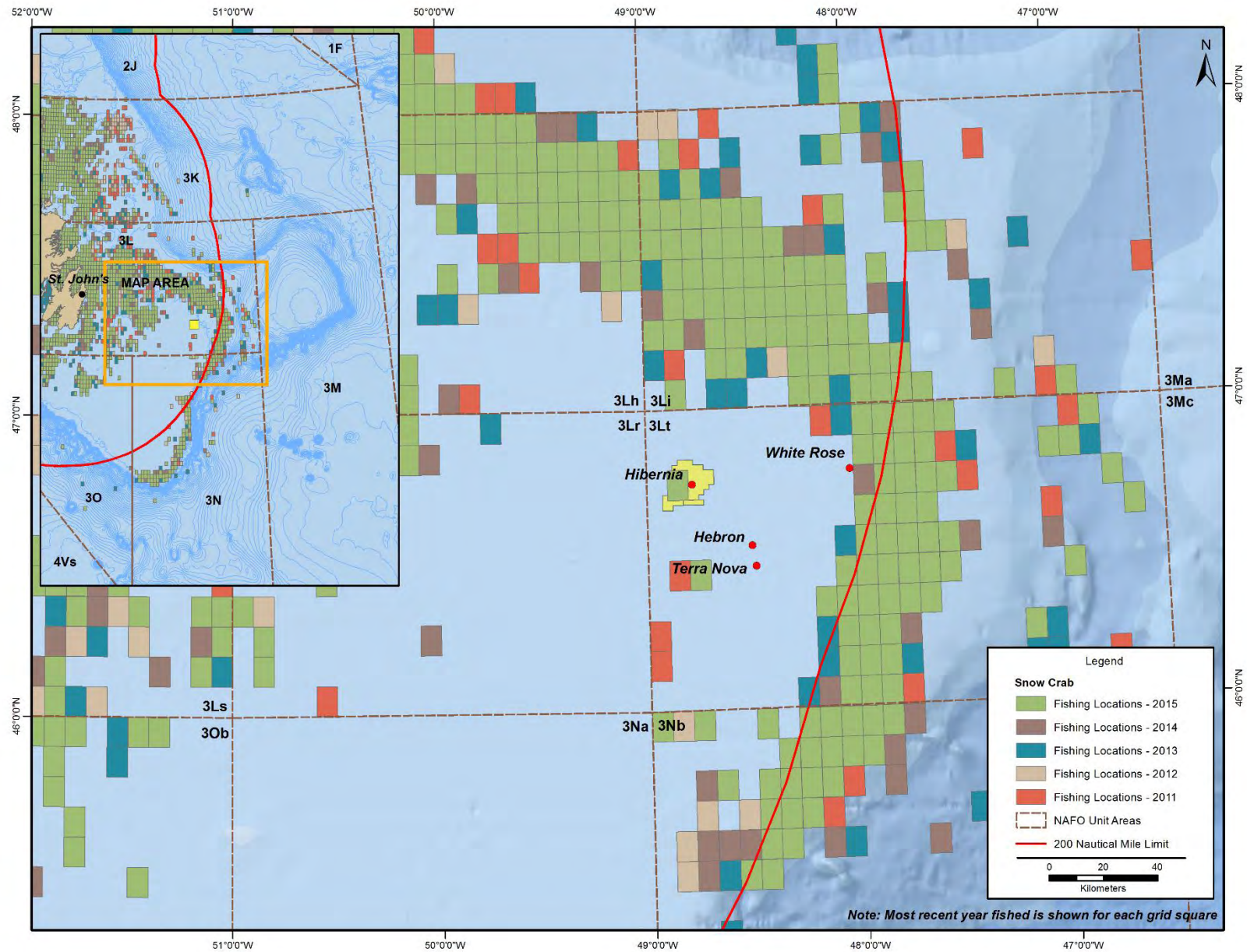
Figure 3.11 Commercial Fishing Locations, Snow Crab (2011-2015)

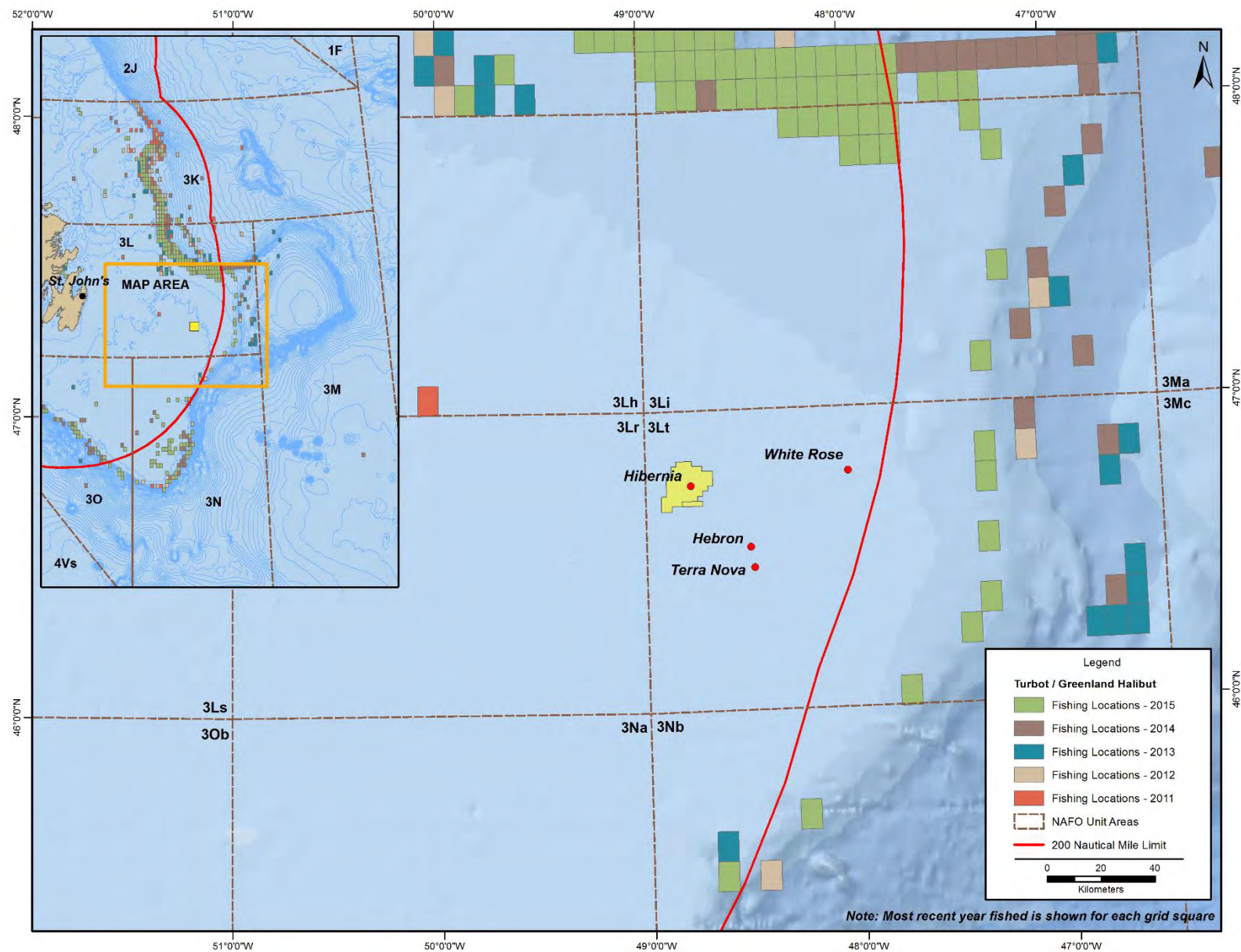
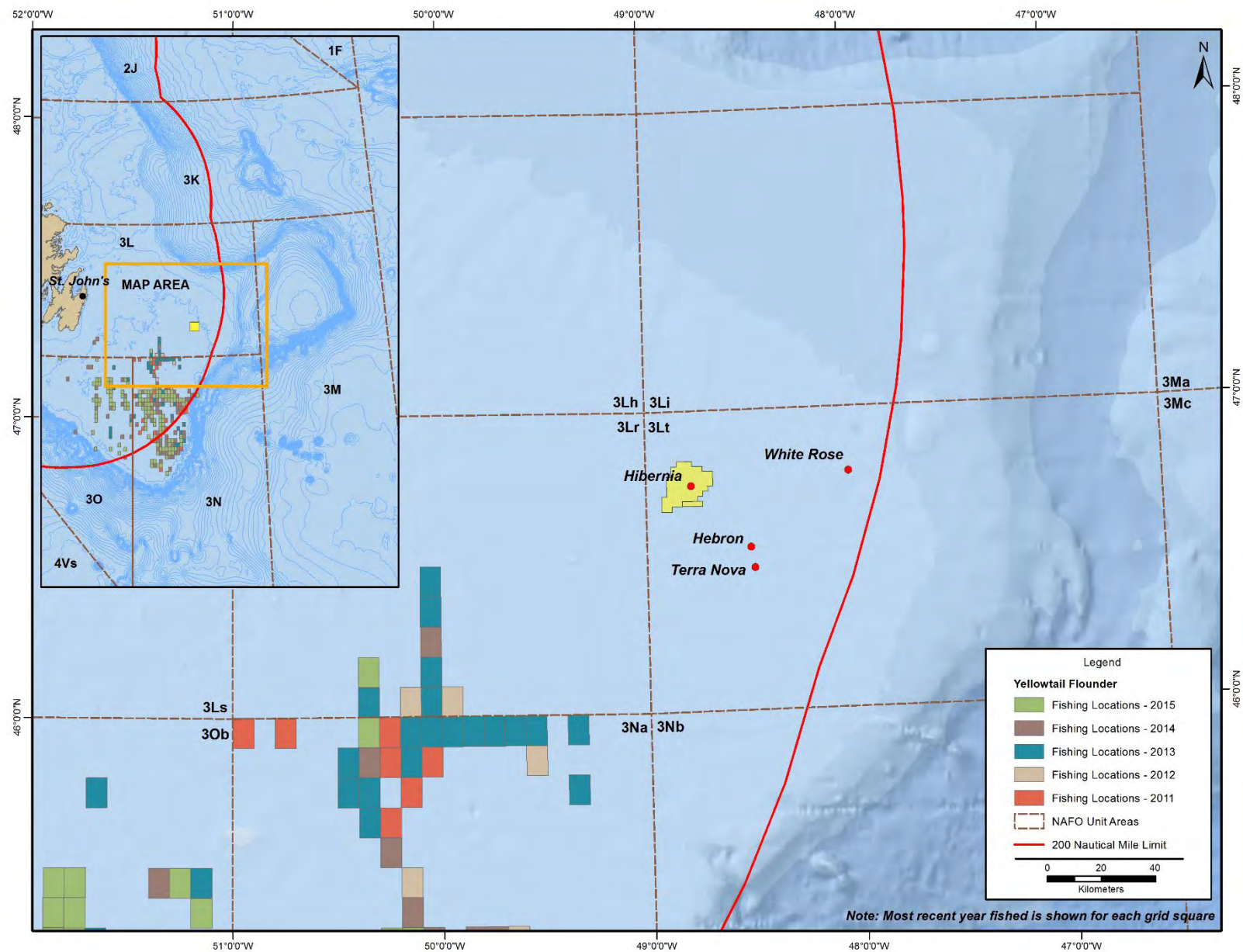
Figure 3.12 Commercial Fishing Locations, Turbot / Greenland Halibut (2011-2015)

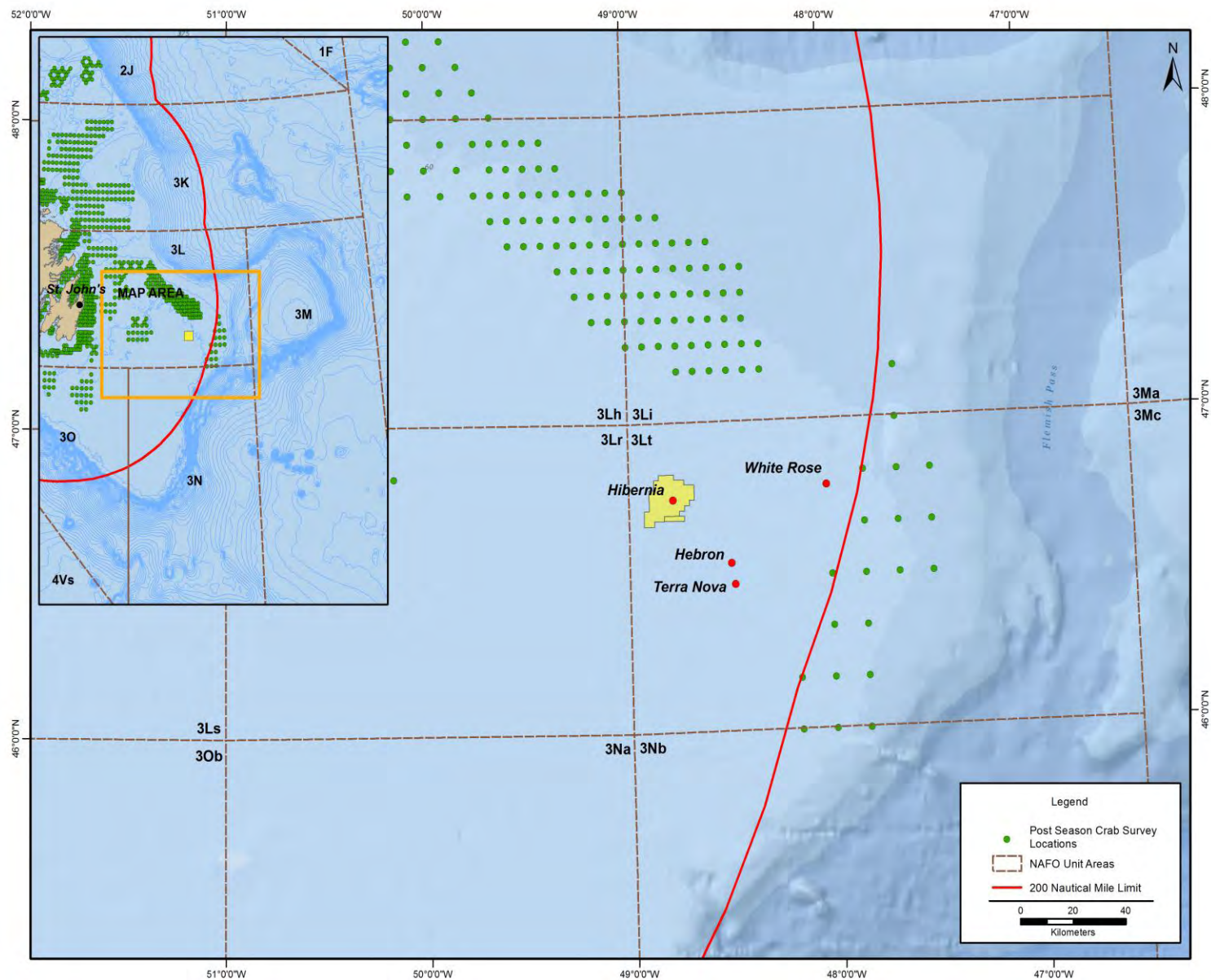
Figure 3.13 Commercial Fishing Locations, Yellowtail Flounder (2011-2015)

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 (tentative) planned 2017 schedule for DFO's surveys as recently obtained from DFO representatives (D. Power, DFO – NL Region, personal communication). HMDC will obtain and verify 2017 survey plans with DFO as they are available, and will consider these and undertake associated consultations and communications with DFO in planning and undertaking its activities, as applicable.

Table 3.1 DFO RV Surveys off Eastern Newfoundland (2017)

Vessel	Activity	NAFO Division	Tentative Start Date	Tentative End Date
CCGS Needler	NL Spring Survey	3P	March 31	April 11
		3P	April 12	April 25
		3P+3O	April 26	May 9
		3O+3N	May 9	May 23
		3L+3N	May 24	June 10
	Shellfish Survey	2J+4R	August 31	September 12
	NL Fall Survey	3O	September 13	September 26
		3O+3N	September 26	October 10
		3N+3L	October 11	October 24
		3L	October 24	November 7
		3K+3L	November 8	November 21
CCGS Teleost	NL Spring AZMP ¹	3L	April 4	April 25
	Capelin Survey	3KL	May 2	May 23
	NL Summer AZMP ¹		July 8	July 29
	NL Fall Survey	2H	October 5	October 10
		2H+2J	October 11	October 24
		2J+3K	October 24	November 7
		3K	November 8	November 21
		3K+3L Deep	November 21	December 5
			December 6	December 20
	¹ Atlantic Zone Monitoring Program Source: D Power, DFO-NL (2017)			

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 the plans for the 2017 surveys are not yet available (D Mullaney, DFO – NL, personal communication). Although, as illustrated in Figure 3.14, the Project Area does not overlap directly with any of these established snow crab survey stations, HMDC will obtain and verify 2017 survey plans when they are available, and will again consider these in consultation with DFO in planning and undertaking its activities.

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, indicating their current designations under applicable

legislation and by COSEWIC. As of November 2016, blue shark is no longer designated by COSEWIC. There have been no other relevant designation changes within the past year.

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	
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
Cetorhinidae	Basking shark	<i>Cetorhinus maximus</i>		Special Concern	
Gadidae	Atlantic cod (Newfoundland and Labrador population)	<i>Gadus morhua</i>		Endangered	
Gadidae	Cusk	<i>Brosme 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 (Atlantic and Northern Gulf of St. Lawrence population)	<i>Urophycis tenuis</i>		Threatened	
Pleuronectidae	American plaice (Newfoundland and Labrador population)	<i>Hippoglossoides platessoides</i>		Threatened	
Rajidae	Smooth skate (Funk Island Deep Population)	<i>Malacoraja senta</i>		Endangered	
Rajidae	Thorny skate	<i>Amblyraja radiata</i>		Special Concern	
Rajidae	Winter Skate	<i>Leucoraja</i>		Endangered	

Family	Species		Federal		Provincial
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
	(Eastern Scotian Shelf – Newfoundland)	<i>ocellata</i>			
Salmonidae	Atlantic salmon (South Newfoundland Population; outer Bay of Fundy population)	<i>Salmo salar</i>		Threatened (South Newfoundland Population); Endangered (outer Bay of Fundy population)	
Scombridae	Atlantic bluefin tuna	<i>Thunnus thynnus</i>		Endangered	
Scorpaenidae	Acadian redfish (Atlantic population)	<i>Sebastes fasciatus</i>		Threatened	
Scorpaenidae	Deepwater redfish (Northern Population)	<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	
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	

Family	Species		Federal		Provincial
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
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 2017 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 2017 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 2017 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.