ENVIRONMENTAL ASSESSMENT UPDATE: Hibernia Project Operations 2018

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 (Hibernia Development Project Environmental Impact Statement, Mobil Oil Canada Ltd 1985), 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.

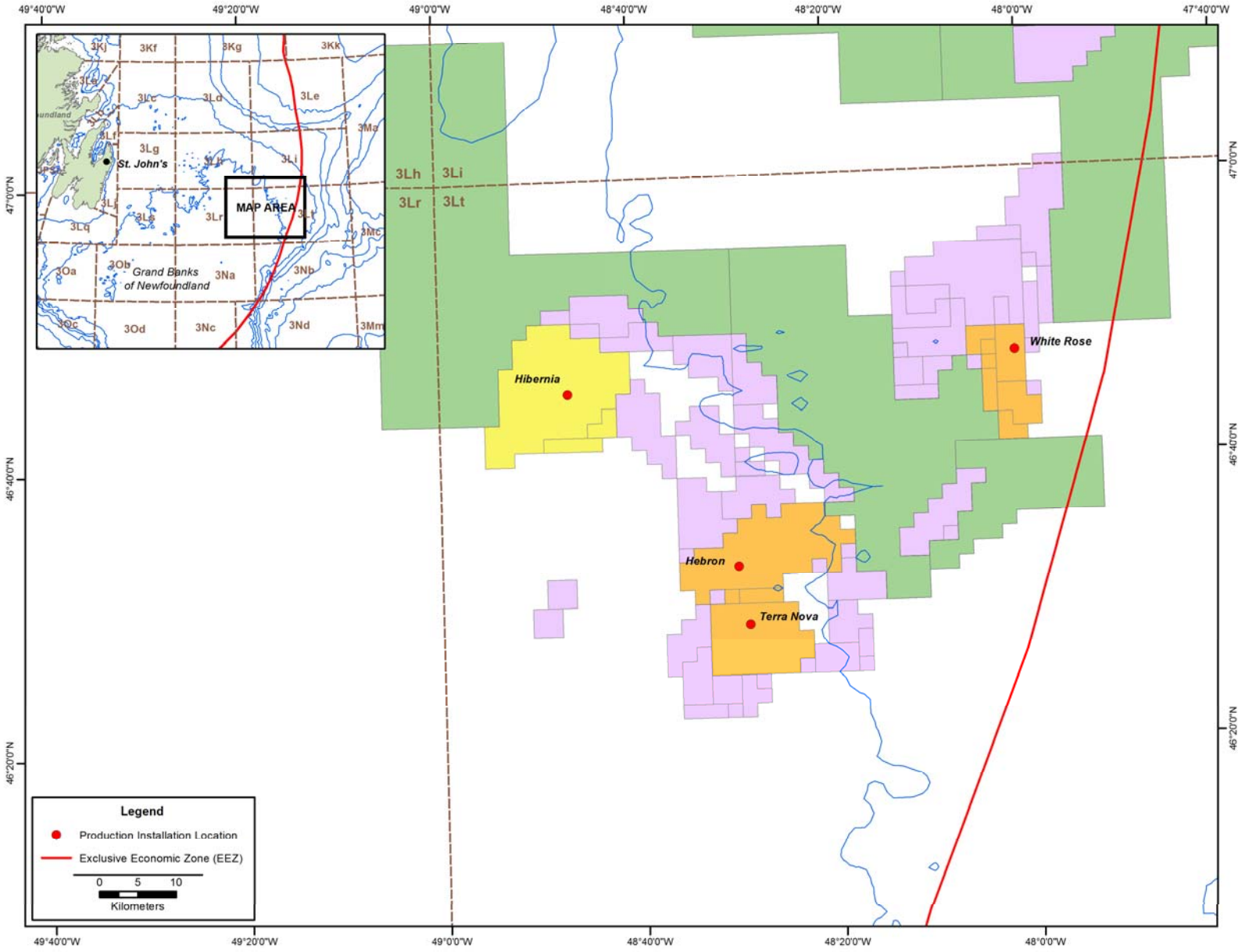
In recent years, the Hibernia development has been further expanded to include the Hibernia Southern Extension (HSE), a subsea development consisting of various water injection wells connected to the Hibernia platform by subsea flowlines. As part of planned future extensions to the Hibernia development, 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. This was followed by subsequent requests for, and the submission and review of, additional information (including the final EA Report, Jacques Whitford Ltd 2009) 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.

Figure 1.1 Project Area



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 Canada - 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 2017, which have: 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; and described any public and stakeholder consultation activities that have occurred. In doing so, the EA Updates have evaluated and confirmed 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 2018 EA Update for the Hibernia Project Operations.

2 PROJECT DESCRIPTION (PLANNED 2018 ACTIVITIES)

In 2018, normal drilling and production operations will continue as usual on the Hibernia platform. There will be no drilling activity in the HSE drill centre area in 2018.

2.1 Drilling

In 2017, the Hibernia Platform drilling rigs (M71/M72) drilled, worked over and completed wells B-16 31, B-16 20V, B-16 53Z, B-16 49Y, B-16 41Z and B-16 11Z. Drilling operations also commenced on B-16 35Z and will conclude in early 2018. During 2018, HMDC plans to drill, complete or work-over B-16 35Z, B-16 30Y, B-16 36Z, B-16 22Y, B-16 4Y & B-16 63Z as well as a period of reduced drilling activity during the 2018 Hibernia production maintenance shutdown.

The majority of the drilling planned for 2018, will utilize synthetic based mud (SBM) with the drilled cuttings processed and injected using the platform cuttings re-injection system. In addition to SBM, HMDC began utilizing *Ultradril* water based mud (WBM) in the 311 mm hole section for shallow Ben Nevis Avalon wells. While drilling with WBM, the cuttings are discharged overboard. Continued use of WBM is planned in 2018 for select 311 mm and 432 mm hole sections.

2.2 Production

Production operations on the Hibernia Platform continue with the processing of approximately 22,000 m^3 of crude oil daily. This involves the separation of oil, gas and water with produced water treated for discharge and most gas being compressed for injection back into the reservoir. Produced gas is also used for power generation and maintaining a flare.

A maintenance turnaround is planned to commence in September 2018. During this time, production will be shut in for a period of approximately four weeks. This is a regular maintenance turnaround typically scheduled every three years for equipment maintenance, repair and upgrades.

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 2018 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 2018 Activities in Relation to the Overall Project and EA Scope.

The planned 2018 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 (Jacques Whitford 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), 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 2018 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.

Additional, updated information is also provided in this section on identified Special Areas off Eastern Newfoundland, particularly any that have been designated or modified since the original EA was completed, and which are in the general vicinity of the Project Area.

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 updated fisheries information as available at the time. 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 maps that follow (Figures 3.1 to 3.13) 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[1], 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/or 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 2018 activities will not increase or otherwise change the nature or intensity of the Project’s potential interaction with fishing activities, locations and times.

[1] The 2015 fisheries data remain the most current available from DFO as of the time of writing and submission of the 2018 EA Update (J. Hosein, DFO, pers. comm.).

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

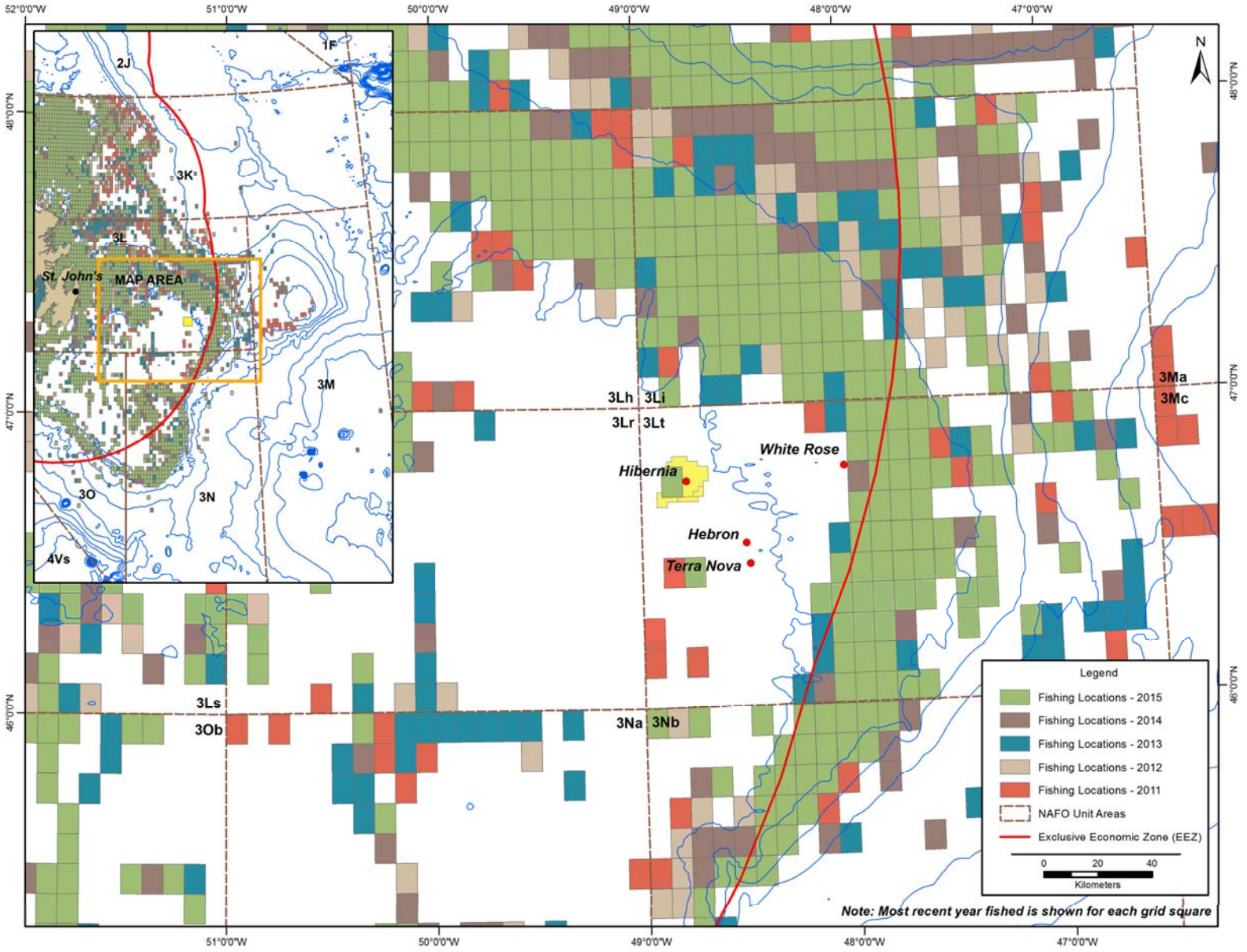


Figure 3.2 Commercial Fishing Locations, Mobile Gear Types (2011-2015)

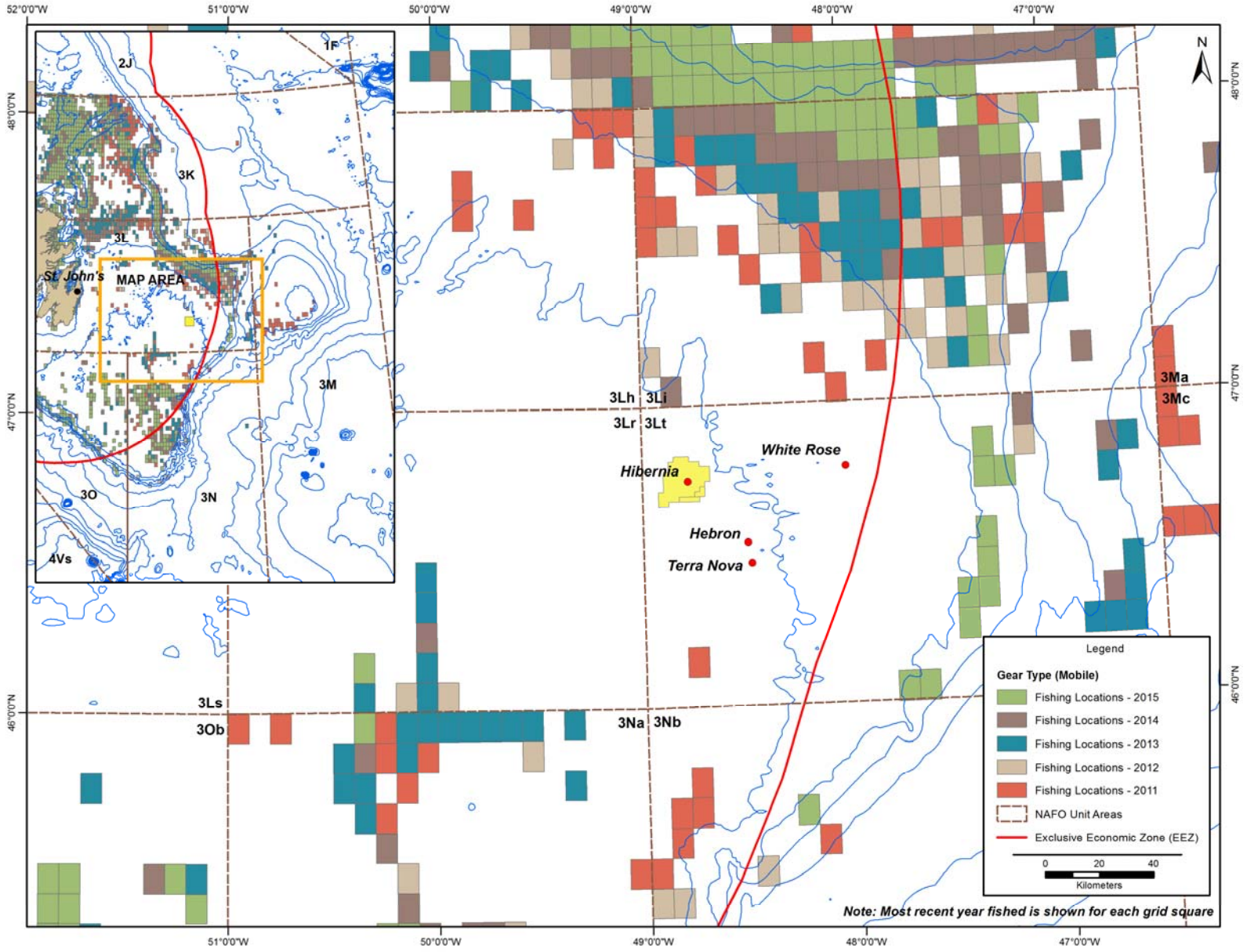


Figure 3.3 Commercial Fishing Locations, Fixed Gear Types (2011-2015)

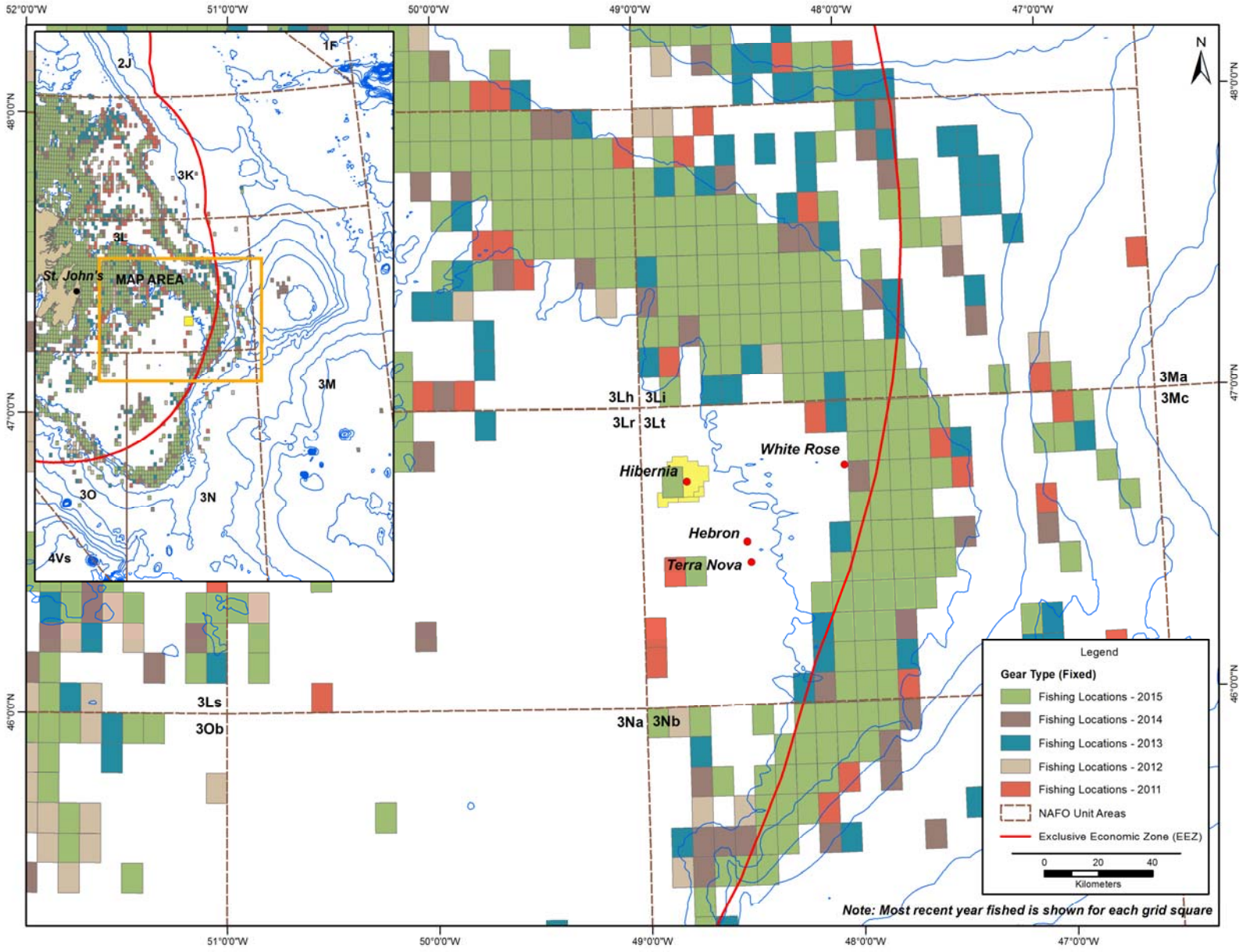


Figure 3.4 Commercial Fishing Locations, American Plaice (2011-2015)

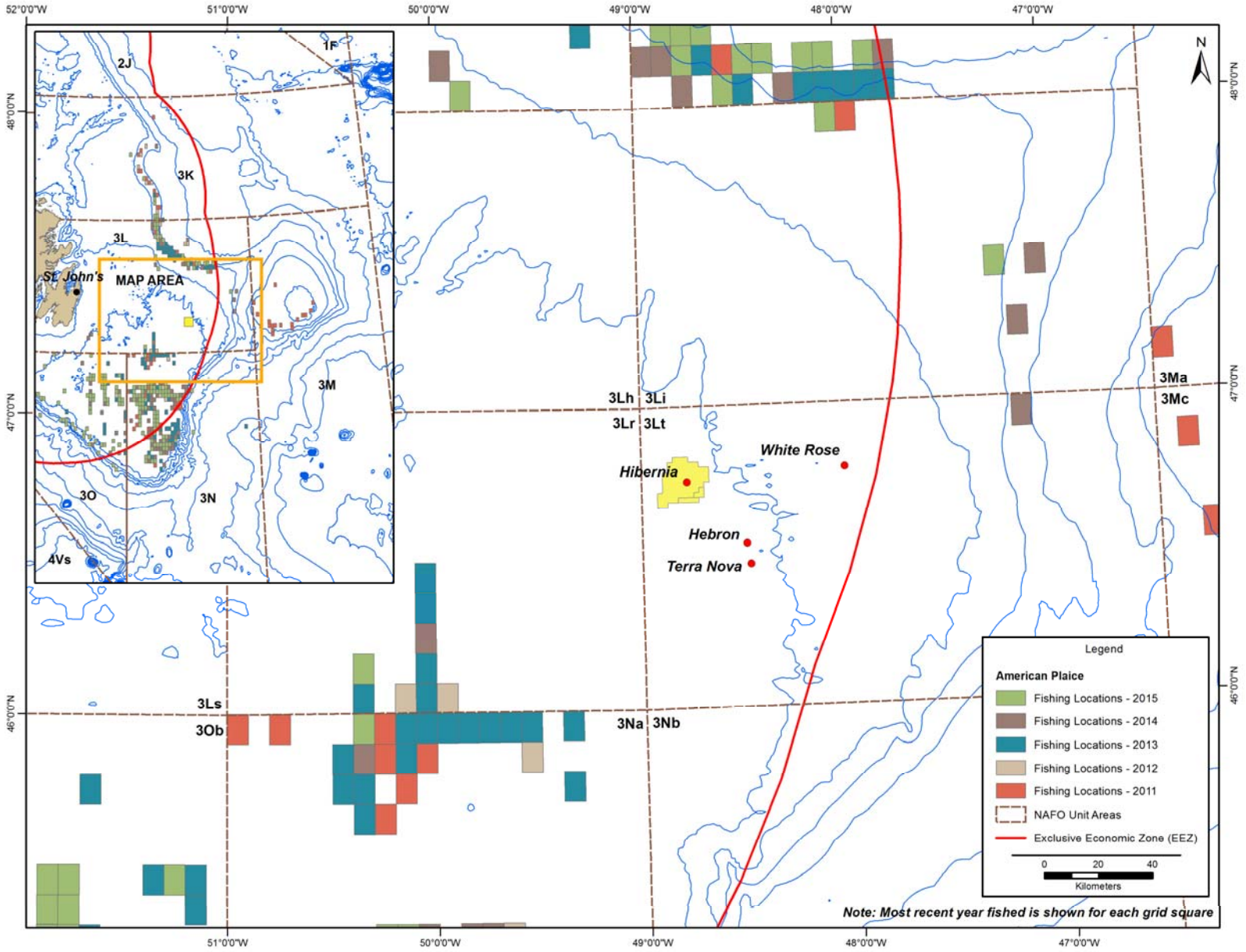


Figure 3.5 Commercial Fishing Locations, Atlantic Cod (2011-2015)

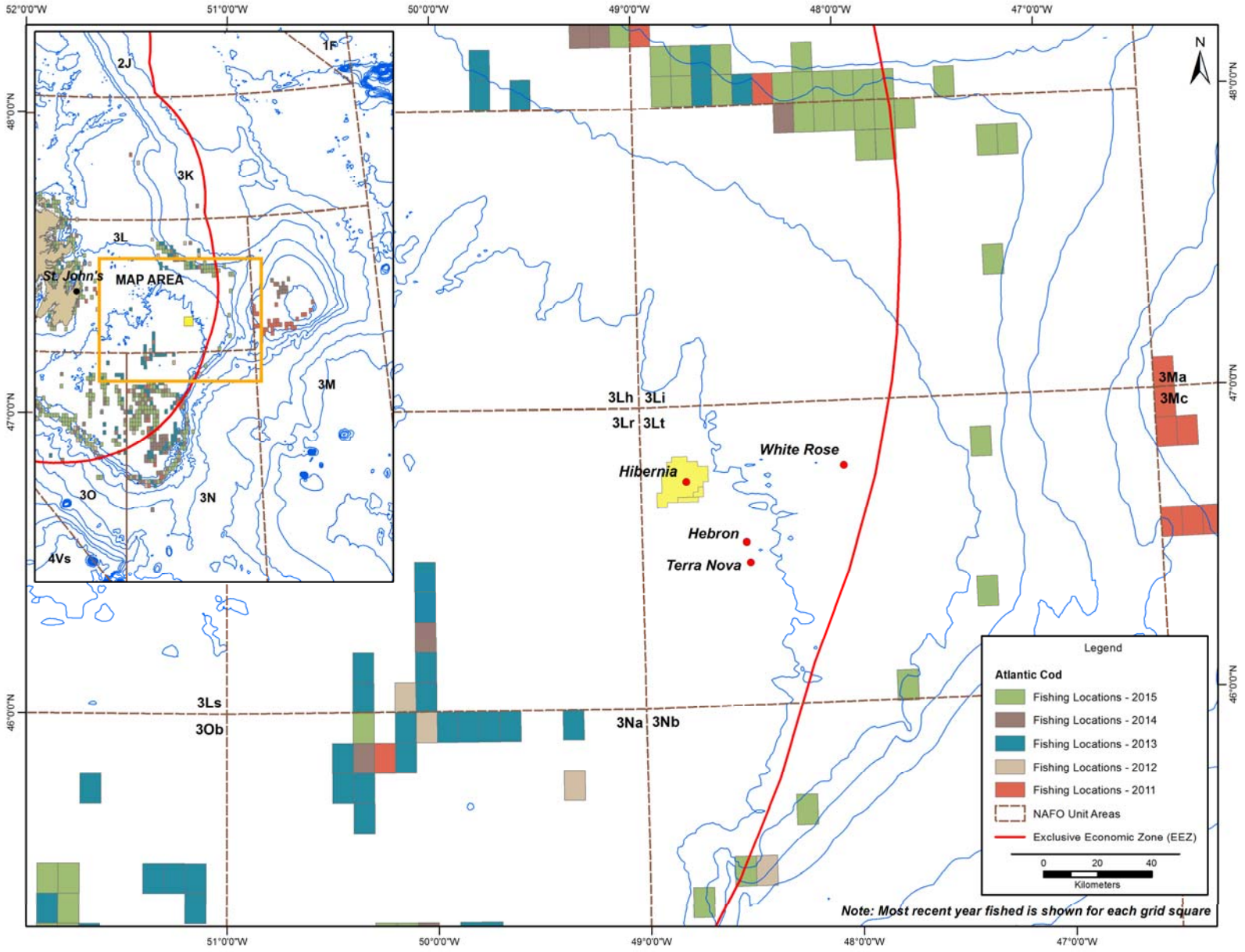


Figure 3.6 Commercial Fishing Locations, Atlantic Halibut (2011-2015)

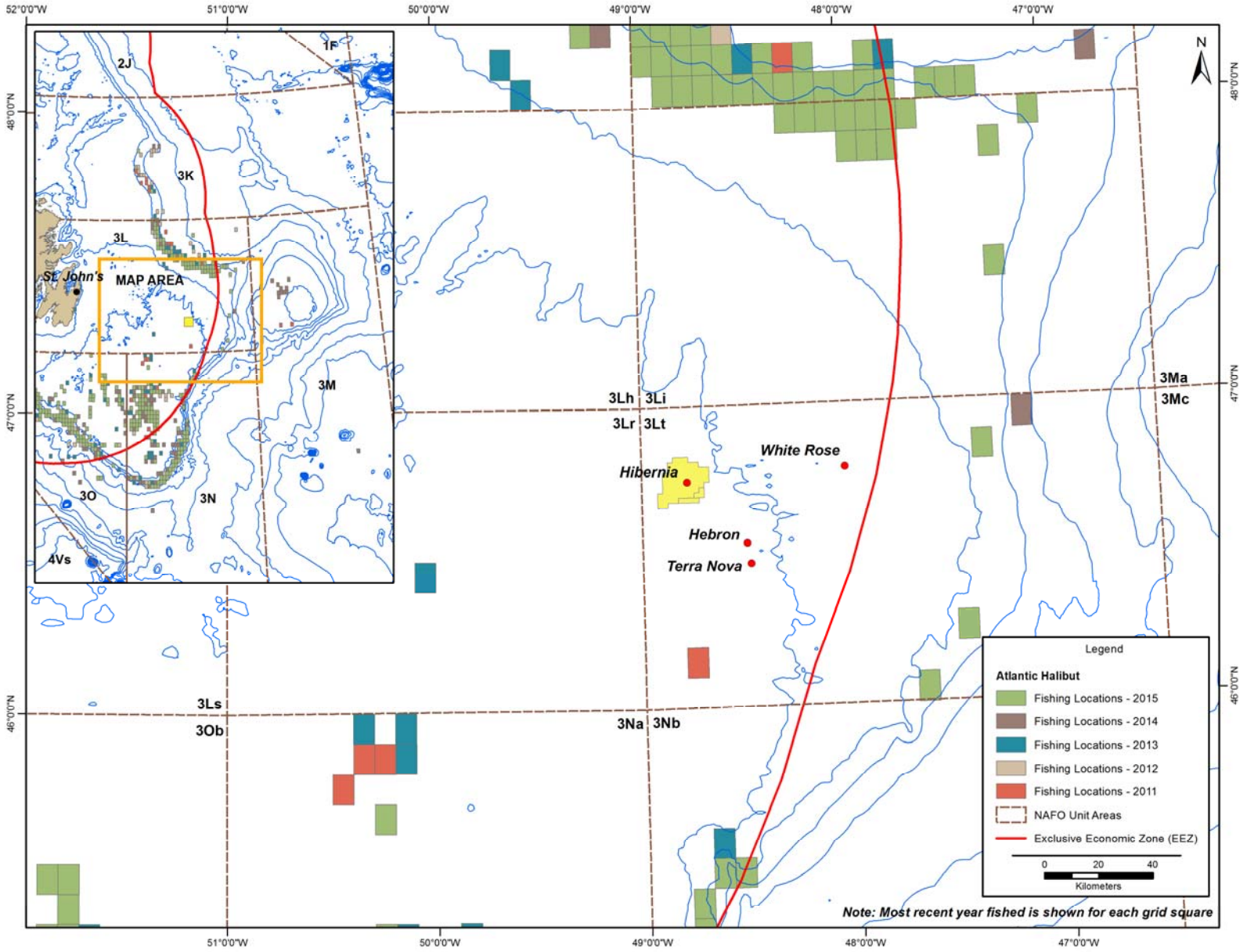


Figure 3.7 Commercial Fishing Locations, Rough-head Grenadier (2011-2015)

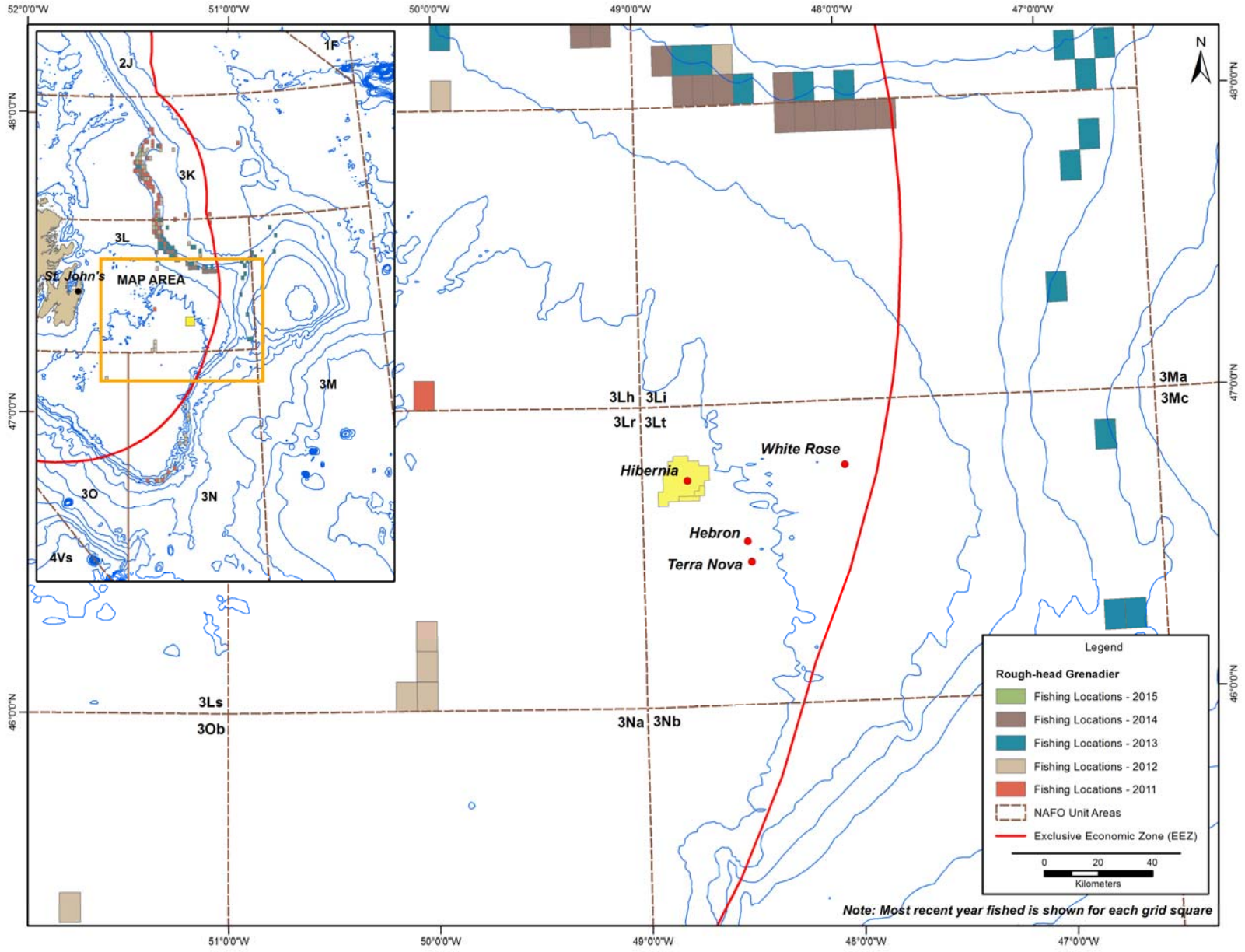


Figure 3.8 Commercial Fishing Locations, Greysole / Witch Flounder (2011-2015)

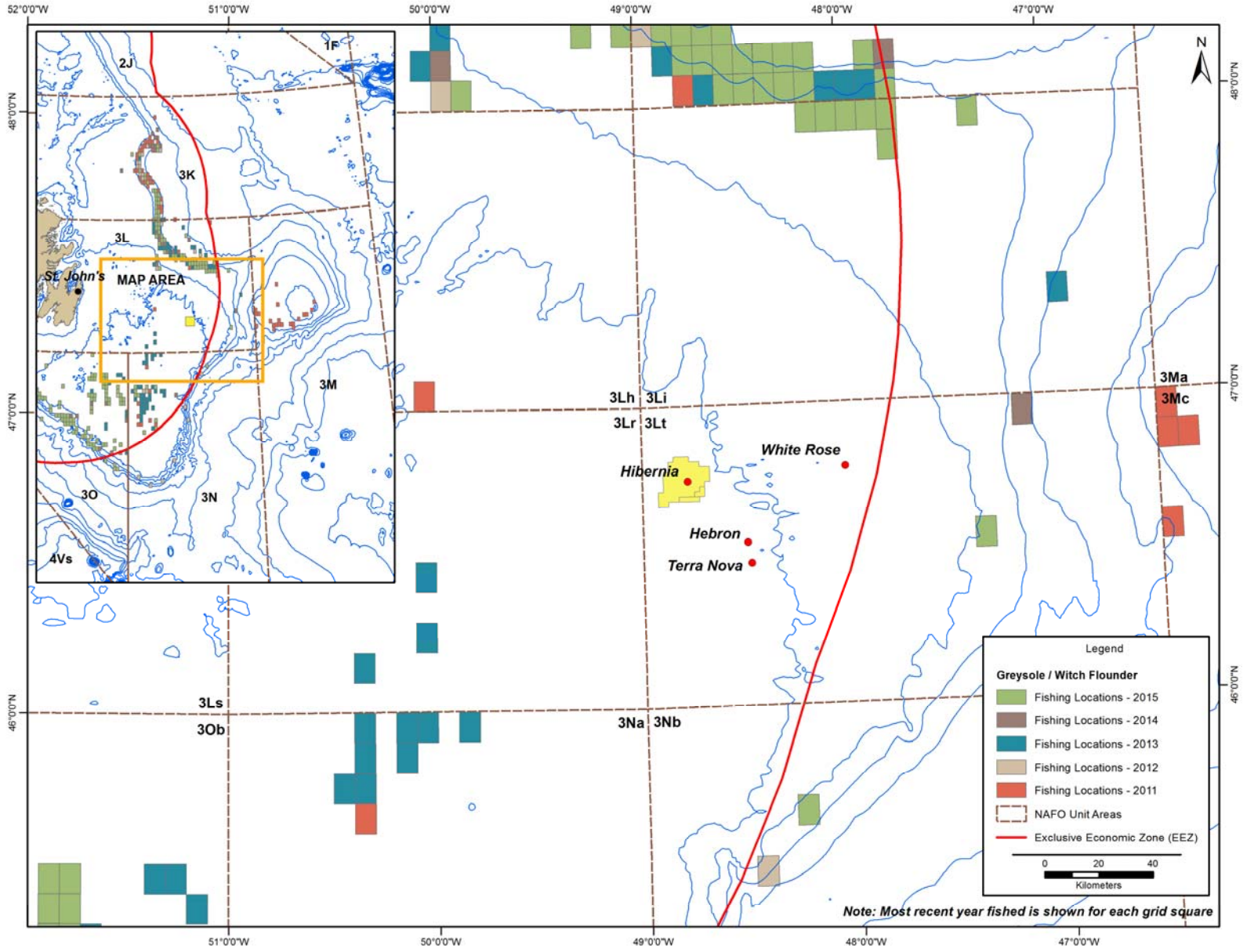


Figure 3.9 Commercial Fishing Locations, Haddock (2011-2015)

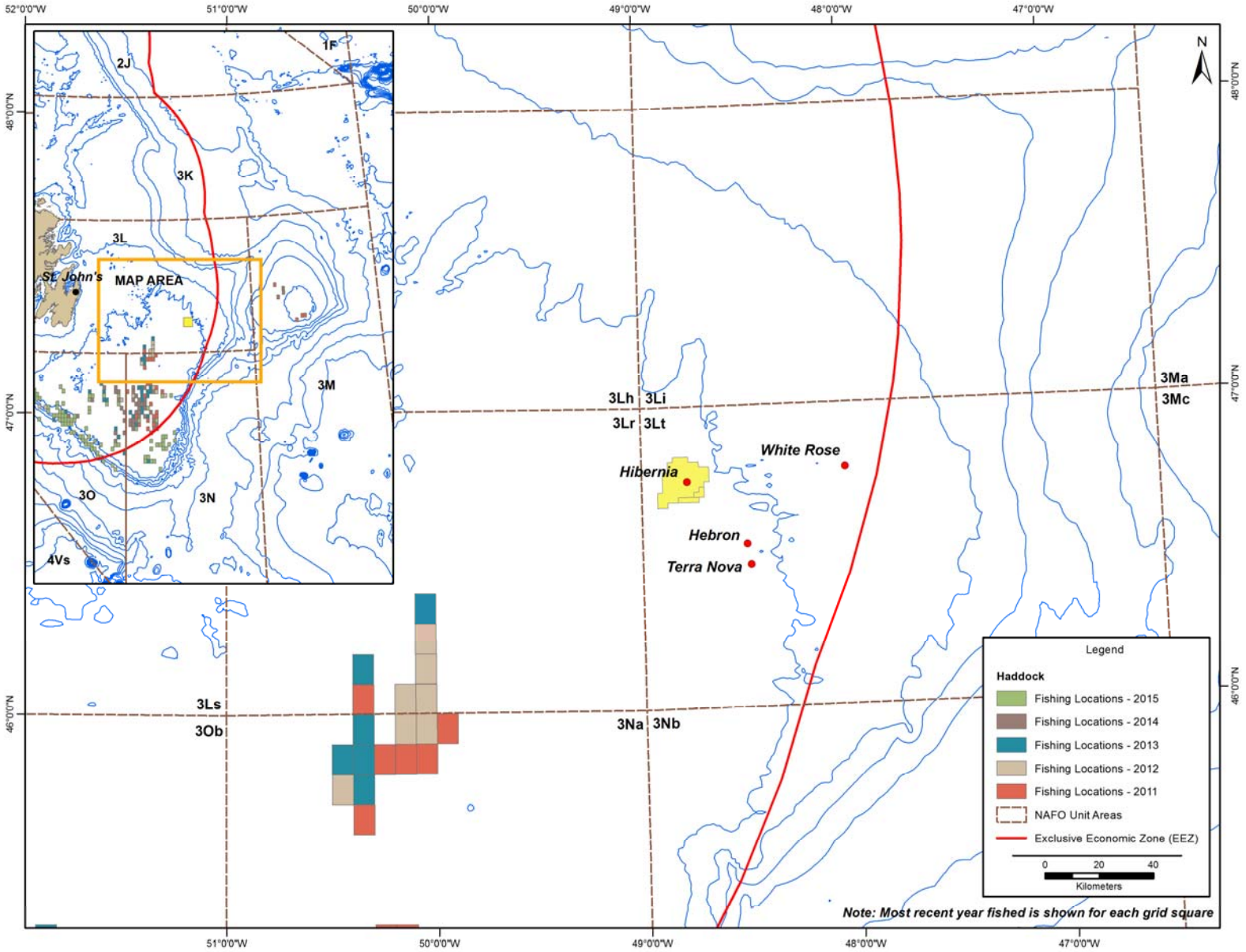


Figure 3.10 Commercial Fishing Locations, Northern Shrimp (2011-2015)

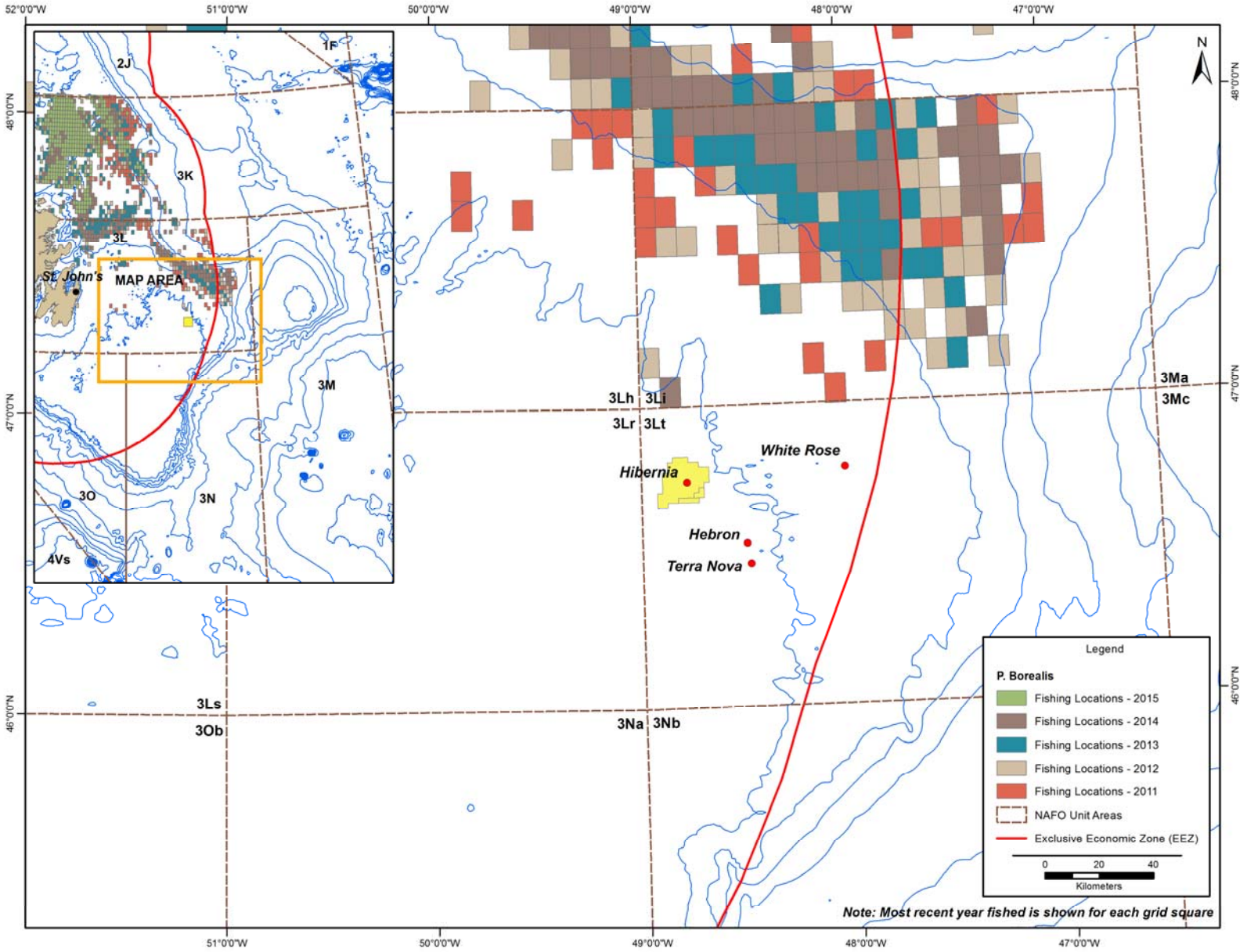


Figure 3.11 Commercial Fishing Locations, Snow Crab (2011-2015)

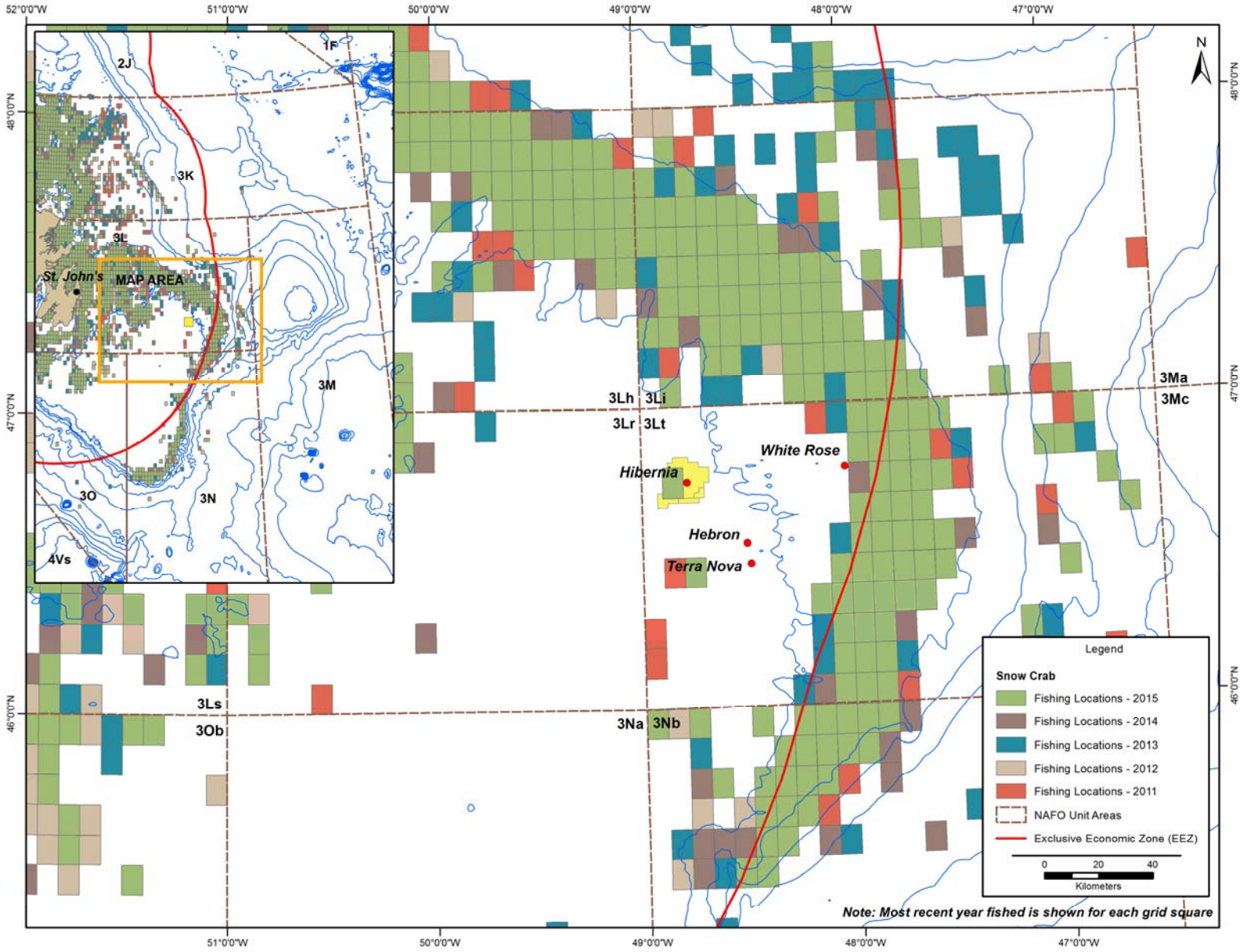


Figure 3.12 Commercial Fishing Locations, Turbot / Greenland Halibut (2011-2015)

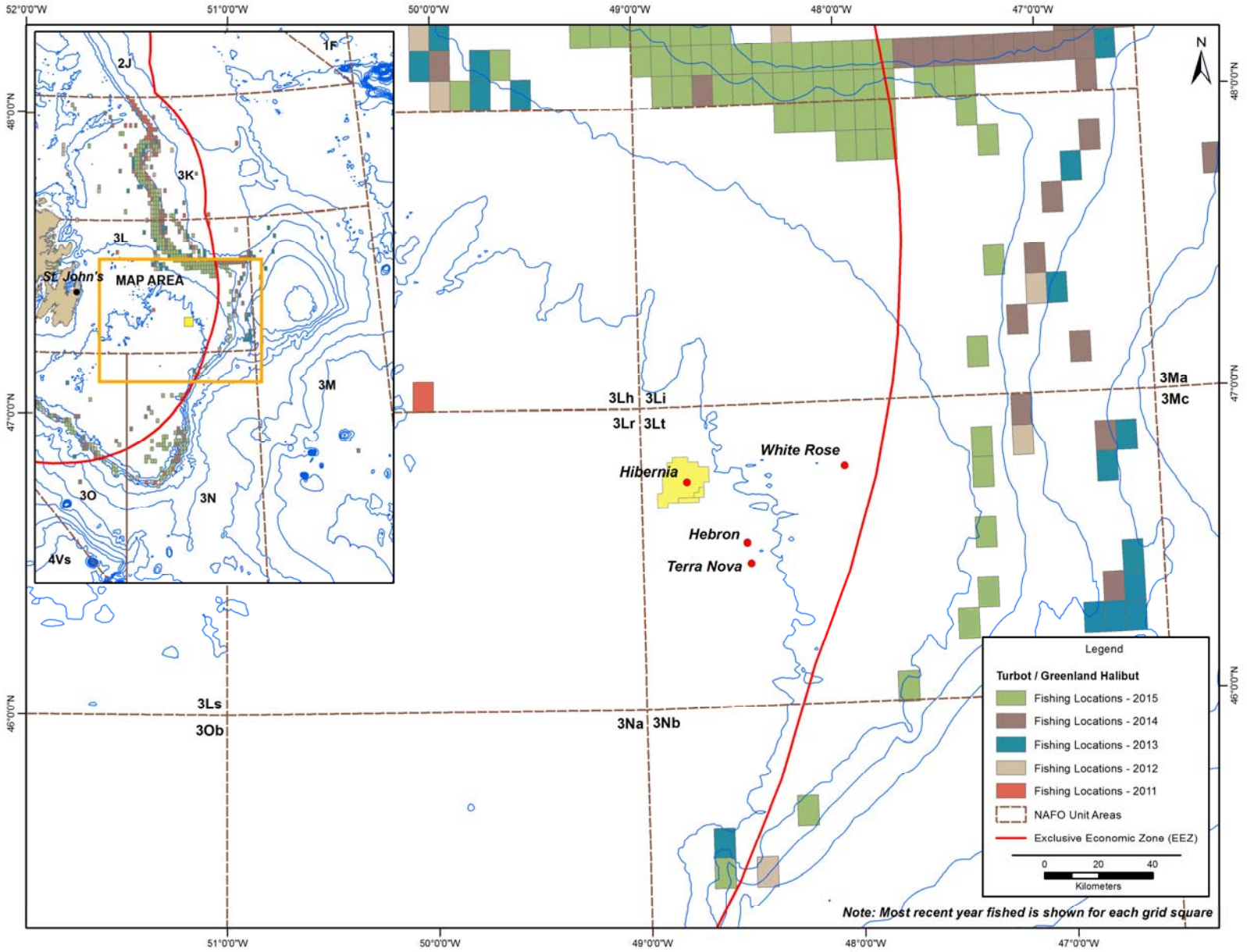
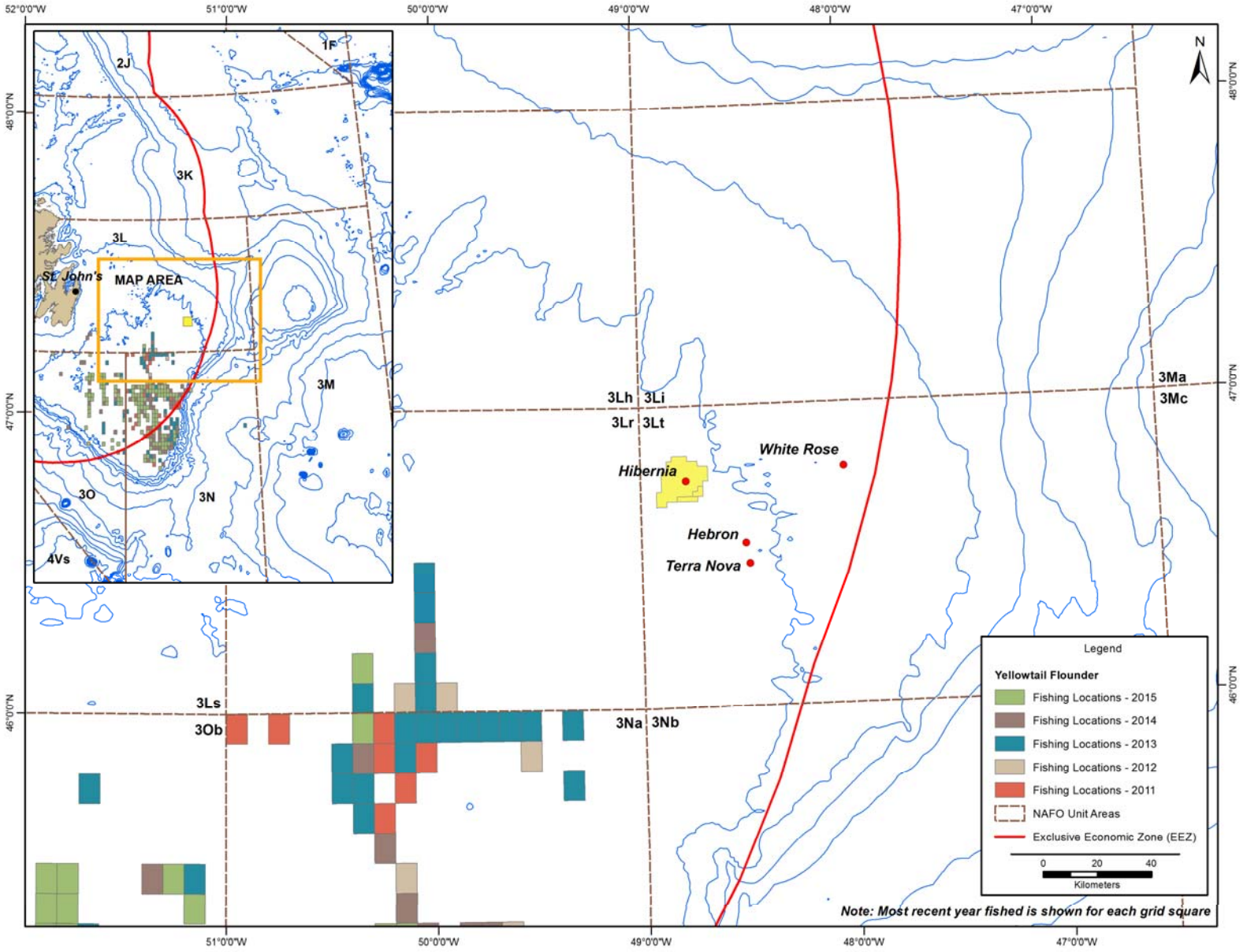


Figure 3.13 Commercial Fishing Locations, Yellowtail Flounder (2011-2015)



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 2017 schedule for DFO's surveys as obtained from DFO representatives (D. Power, DFO – NL Region, pers. comm.). HMDC will obtain and verify 2018 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
			November 21	December 2
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

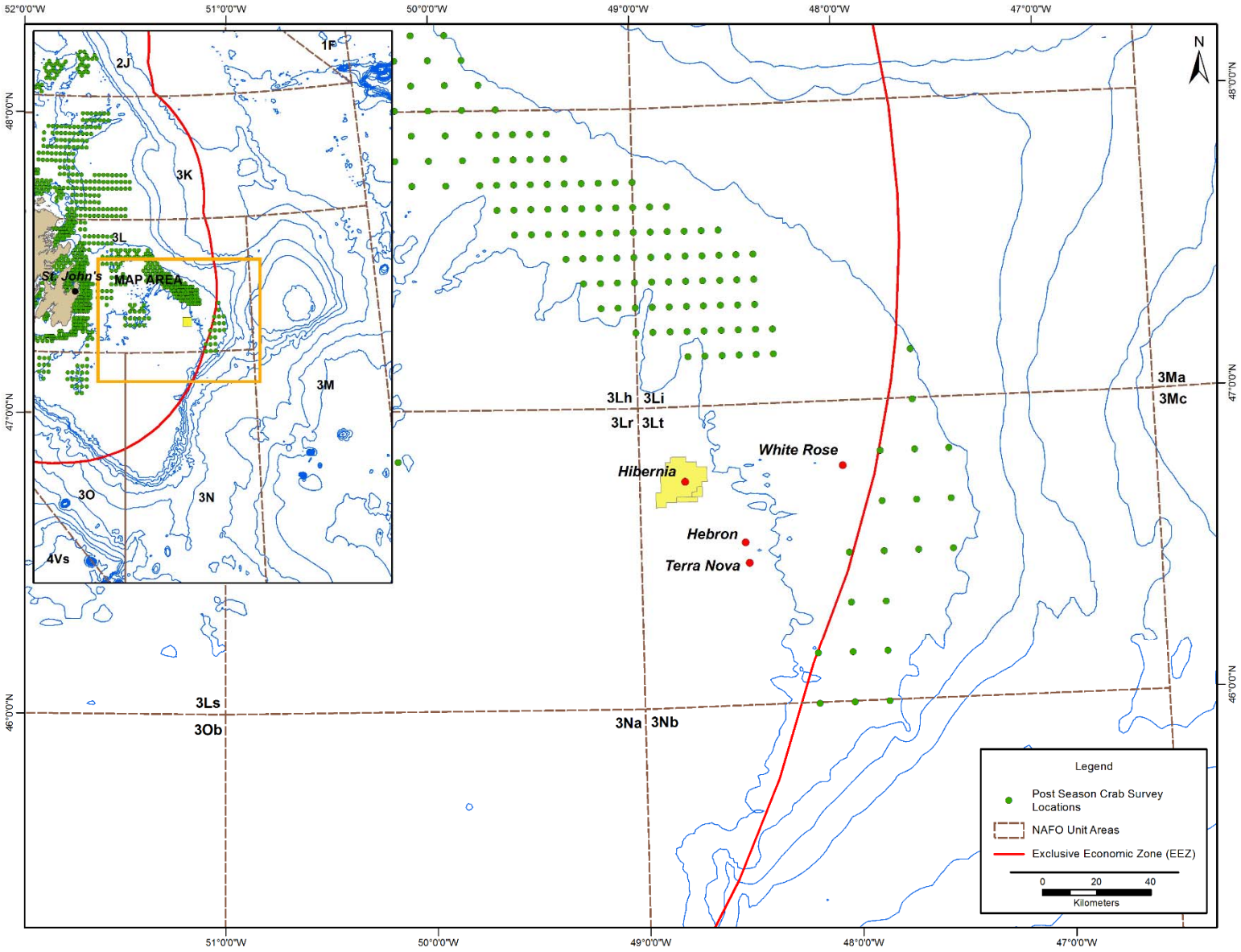
[1] Atlantic Zone Monitoring Program
Source: D Power, DFO-NL (2017)

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. The survey continues until all the stations selected for the year are finished, sometimes into late November. The station locations are determined by DFO, selected from a set of pre-established locations and up to 1,500 are surveyed annually. Each survey station is fixed and follows a general grid pattern.

Figure 3.14 shows the locations of the longstanding stations, which have been the principal focus of this survey, in relation to the Project Area. For 2018 and beyond, it is expected that 50 percent of the stations surveyed will be selected from these locations. The remaining station coordinates will be part of a stratified random design (R. Lee, FFAW-Unifor, pers comm 2018).

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 2018 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 are based on 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. Changes since the 2017 EA Update for this Project are highlighted in the table below.

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

Family	Species		Federal		NL ESA
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
MARINE FISH					
Anarhichadidae	Atlantic wolffish	*Anarhichas lupus*	Special Concern	Special Concern	
Anarhichadidae	Northern wolffish	*Anarhichas denticulatus*	Threatened	Threatened	
Anarhichadidae	Spotted wolffish	*Anarhichas minor*	Threatened	Threatened	
Anguillidae	American eel	*Anguilla rostrata*		Threatened	Vulnerable
Cetorhinidae	Basking shark	*Cetorhinus maximus*		Special Concern	
Gadidae	Atlantic cod (Newfoundland and Labrador population)	*Gadus morhua*		Endangered	
Gadidae	Cusk	*Brosme brosme*		Endangered	
Lamnidae	Porbeagle	*Lamna nasus*		Endangered	
Lamnidae	Shortfin mako	*Isurus oxyrinchus*		Special Concern	
Lamnidae	White shark	*Carcharodon carcharias*	Endangered	Endangered	
Macrouridae	Roughhead grenadier	*Macrourus berglax*		Special Concern	
Macrouridae	Roundnose grenadier	*Coryphaenoides rupestris*		Endangered	
Phycidae	White hake (Atlantic and Northern Gulf of St. Lawrence population)	*Urophycis tenuis*		Threatened	
Pleuronectidae	American plaice (Newfoundland and Labrador population)	*Hippoglossoides platessoides*		Threatened	
Rajidae	Smooth skate (Funk Island Deep Population)	*Malacoraja senta*		Endangered	
Rajidae	Thorny skate	*Amblyraja radiata*		Special Concern	
Rajidae	Winter Skate (Eastern Scotain Shelf - Newfoundland)	*Leucoraja ocellata*		Endangered	
Salmonidae	Atlantic salmon (South Newfoundland	*Salmo salar*		Threatened (South	

Family	Species		Federal		NL ESA
	Common Name	**Scientific Name**	**SARA Status (Schedule 1)**	**COSEWIC Designation**	
	Population; outer Bay of Fundy population)			Newfoundland Population); Endangered (outer Bay of Fundy population)	
Scombridae	Atlantic bluefin tuna	*Thunnus thynnus*		Endangered	
Scorpaenidae	Acadian redfish (Atlantic population)	*Sebastes fasciatus*		Threatened	
Scorpaenidae	Deepwater redfish (Northern Population)	*Sebastes mentella*		Threatened	
Squalidae	Spiny dogfish	*Squalus acanthias*		Special Concern	
MARINE BIRDS					
Laridae	Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Endangered
Scolopacidae	Red-necked Phalarope	*Phalaropus lobatus*		Special Concern	
MARINE MAMMALS AND SEA TURTLES					
Balaenopteridae	Blue Whale - Atlantic Population	*Balaenoptera musculus*	Endangered	Endangered	
Balaenopteridae	Fin Whale - Atlantic Population	*Balaenoptera physalus*	Special Concern	Special Concern	
Balaenidae	North Atlantic Right Whale	*Eubalaena glacialis*	Endangered	Endangered	
Ziphiidae	Northern Bottlenose Whale - Davis Strait, Baffin Bay, Labrador Sea population; Scotian Shelf population	*Hyperoodon ampullatus*	Endangered (Scotian Shelf population)	Special Concern (Davis Strait, Baffin Bay, Labrador Sea population); Endangered (Scotian Shelf population)	
Ziphiidae	Sowerby's Beaked Whale	*Mesoplodon bidens*	Special Concern	Special Concern	
Delphinidae	Killer Whale (Northwest Atlantic / Eastern Arctic population)	*Orcinus orca*		Special Concern	
Phocoenidae	Harbour Porpoise (Northwest Atlantic population)	*Phocoena phocoena*		Special Concern	
Dermochelyidae	Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	Endangered	
Cheloniidae	Loggerhead Sea Turtle	*Caretta caretta*	Endangered	Endangered	

The planned 2018 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 Special Areas

A number of marine and coastal areas within and off Eastern Newfoundland have been designated as protected under provincial, federal and/or other legislation and processes, or have been formally identified through relevant forums and processes as being otherwise special or sensitive due to their ecological, historical and/or socio-cultural characteristics and importance.

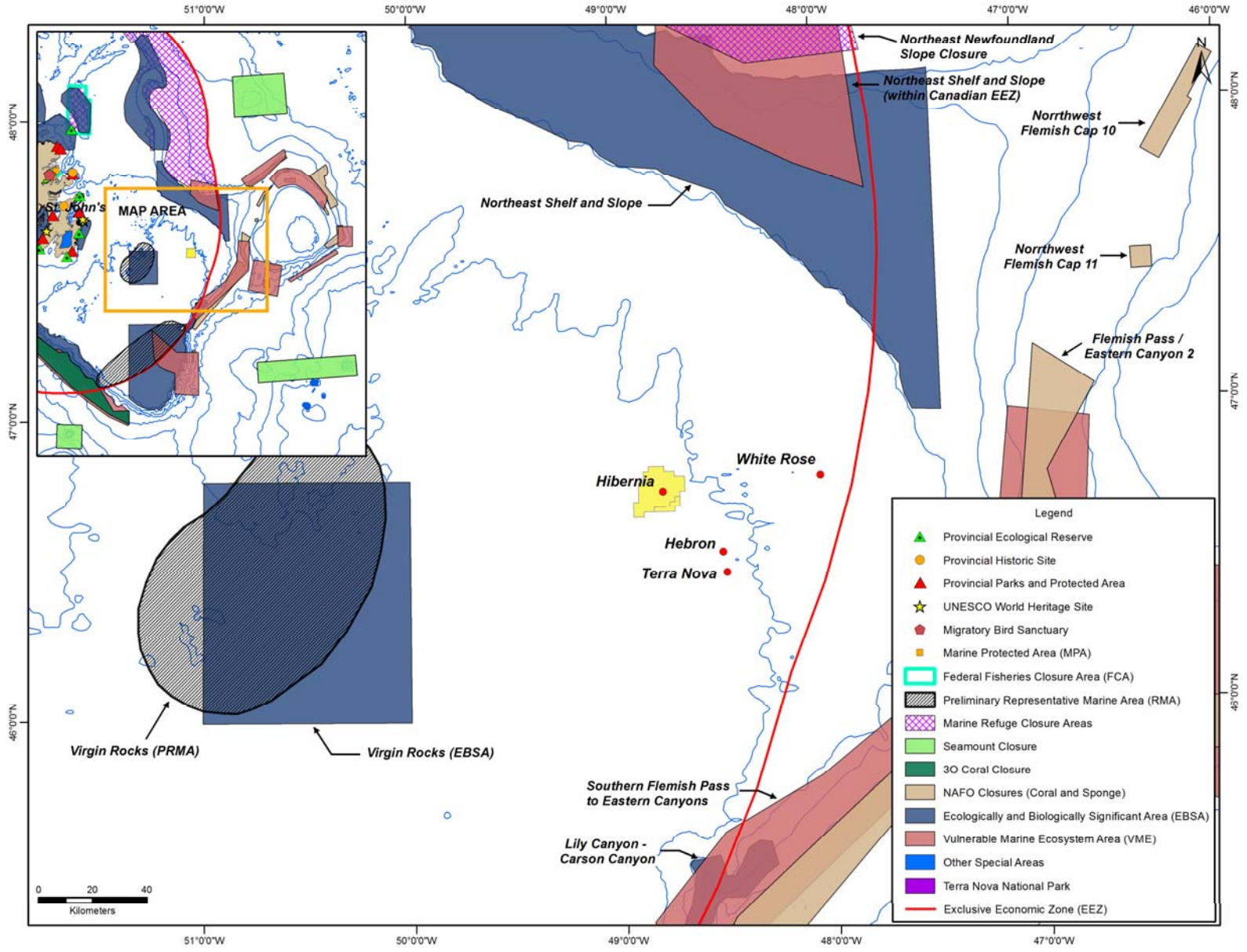
Given its location offshore, the Hibernia Project does not occur within, or otherwise interact directly with, any of the existing provincial or federal Parks or Historic Sites, Ecological Reserves, Wildlife Reserves, Marine Protected Areas and Areas of Interest, Migratory Birds Sanctuaries, IBAs or other locations that have been designated as protected on or around the coast of the Island of Newfoundland (Amec 2014). The Project Area likewise does not overlap with any of the identified Ecologically and Biologically Significant Areas (EBSAs), Preliminary Representative Marine Areas (RMAs), Marine Refuges, Federal Fishery Closure Areas, Vulnerable Marine Ecosystems (VMEs) or NAFO Fishery Closure Areas (FCAs) in the offshore environment of Eastern Newfoundland (Figure 3.15).

Several types of special areas are located within 100 km of the Hibernia Project as follows (Figure 3.15):

- The Northeast Shelf and Slope EBSA is approximately 90 km from the Hibernia Project and the Virgin Rocks EBSA is within 85 km. EBSAs are designated under the *Oceans Act* by DFO for their ecological criteria of fitness, aggregations, uniqueness, naturalness and resilience (Templeman 2007; DFO 2013).

- The Virgin Rocks Preliminary Representative Marine Area (RMA) is located within 95 km of the Hibernia Project. Parks Canada has stated its long-term goal of establishing at least one national marine conservation area within each of 29 Marine Regions identified to encompass all of Canada's coastlines. The Virgin Rocks RMA is one of several identified within the Grand Banks Marine Region (Parks Canada 2017).

Figure 3.15 Special Areas



3.4 Applicability of Associated Environmental Effects Analysis and Identified Mitigation

The planned 2018 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 interactions, potential effects and associated mitigation measures (as reflected in the EA Reports and subsequent EA Update submissions) therefore remain applicable to the nature and scope of the planned 2018 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.

4 REFERENCES

Personal Communications

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