# Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024

## 2019 Environmental Assessment Update

**FINAL REPORT**

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**Appendix A** Mitigation Measures Identified and Committed to in the EA Report and EA Addendum and Amendment

# 1 INTRODUCTION

ExxonMobil Canada Ltd. (ExxonMobil) is undertaking a marine petroleum exploration program, including geophysical, geochemical, environmental and geotechnical survey activities, in the eastern portion of the Canada-Newfoundland and Labrador Offshore Area (hereinafter also referred to as the Project). The Project has and will require authorizations from the Canada – Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), pursuant to Section 138 (1)(b) of the *Canada – Newfoundland Atlantic Accord Implementation Act* and Section 134(1)(b) of the *Canada – Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (the Accord Acts).

As part of these required regulatory review and approval processes, ExxonMobil filed an Environmental Assessment (EA) in relation to the proposed marine exploration program in 2015. This assessment was planned, prepared and submitted in compliance with the associated EA requirements and processes of the C-NLOPB, including a Project-specific EA Scoping Document issued by the C-NLOPB on March 2, 2015. ExxonMobil's EA Report for the Project (Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024 Environmental Assessment, prepared by Amec Foster Wheeler, July 2015) was submitted to the C-NLOPB on July 14, 2015. ExxonMobil's EA Report concluded that:

> *Each of the potential environmental issues and effects that could be associated with the proposed Project can be avoided or otherwise mitigated through the use of good planning and proven operational practices and procedures, supported by Project-specific and industry standard mitigations that are well established and outlined in relevant regulatory procedures and guidelines, and which have been identified by ExxonMobil as part of this Environmental Assessment…Overall, the proposed Project will entail a very localized, short-term and transient disturbance in the marine environment at any one location and time throughout the operational life of the exploration program. It is therefore not anticipated to displace or otherwise affect marine fish, birds, mammals, turtles, fisheries or other marine activities in such a way that causes negative and detectable effects to populations, species at risk or human activities in the region...The proposed Project is therefore not likely to result in significant adverse environmental effects. (Section 6.0).*

The EA Report was published on the Board website for governmental, stakeholder and public review and comment, with the C-NLOPB inviting comments on the EA Report until September 4, 2015. On September 30, 2015 the Board provided ExxonMobil with the consolidated comments received during that review.

In February 2016, ExxonMobil submitted an EA Addendum and Amendment for the Project. That document was intended as a supplement to the original EA Report and provided responses that addressed the various questions and associated requests for information and clarification that were submitted by government departments and agencies and other organizations as part of the EA review, as consolidated and provided to ExxonMobil by the C-NLOPB in September 2015. This document also described a proposed modification to the Project as compared to that which was described and assessed in the original (July 2015) EA Report, which involved a slight expansion of the northeastern portion of the proposed Project Area. Following review by the C-NLOPB and the above noted review organizations, a revised version of that EA Addendum and Amendment was prepared and submitted by ExxonMobil in May 2016.

On June 9, 2016 the C-NLOPB issued its EA determination related to the Project, which stated that:

> *The C-NLOPB has completed its EA determination respecting the Project. The EA Report, Addendum, and Amendment…describes the Project in sufficient detail and provides an acceptable assessment of the potential environmental effects of the Project. We have considered this information and the advice of the Boards' advisory agencies and have determined that the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects….*
>
> *At the time of application for subsequent program authorizations in the Project Area, ExxonMobil Canada Ltd. will be required to provide information to the C-NLOPB. This information should outline the proposed activities, confirm that the proposed program activities fall within the scope of the previously assessed program, and indicate if, with this information, the EA predictions remain valid.*

In April 2018, ExxonMobil submitted an EA Update for the Project. That document provided an update of the project in ahead of the 2018 field program.

This document provides the 2019 EA Update for the Project. It includes an overview of planned Project activities for the upcoming year and updates any applicable environmental baseline information for key environmental components that has become available since the original EA Report and EA Addendum and Amendment and associated 2018 EA Update were produced. In doing so, the EA Update evaluates and confirms 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.

# 2 PROJECT DESCRIPTION

The following provides a brief overview of the original Project Description (as provided in the initial EA Report) for background and context, followed by a description of ExxonMobil's planned 2019 Project activities.

## 2.1 Overview of the Original Project Description

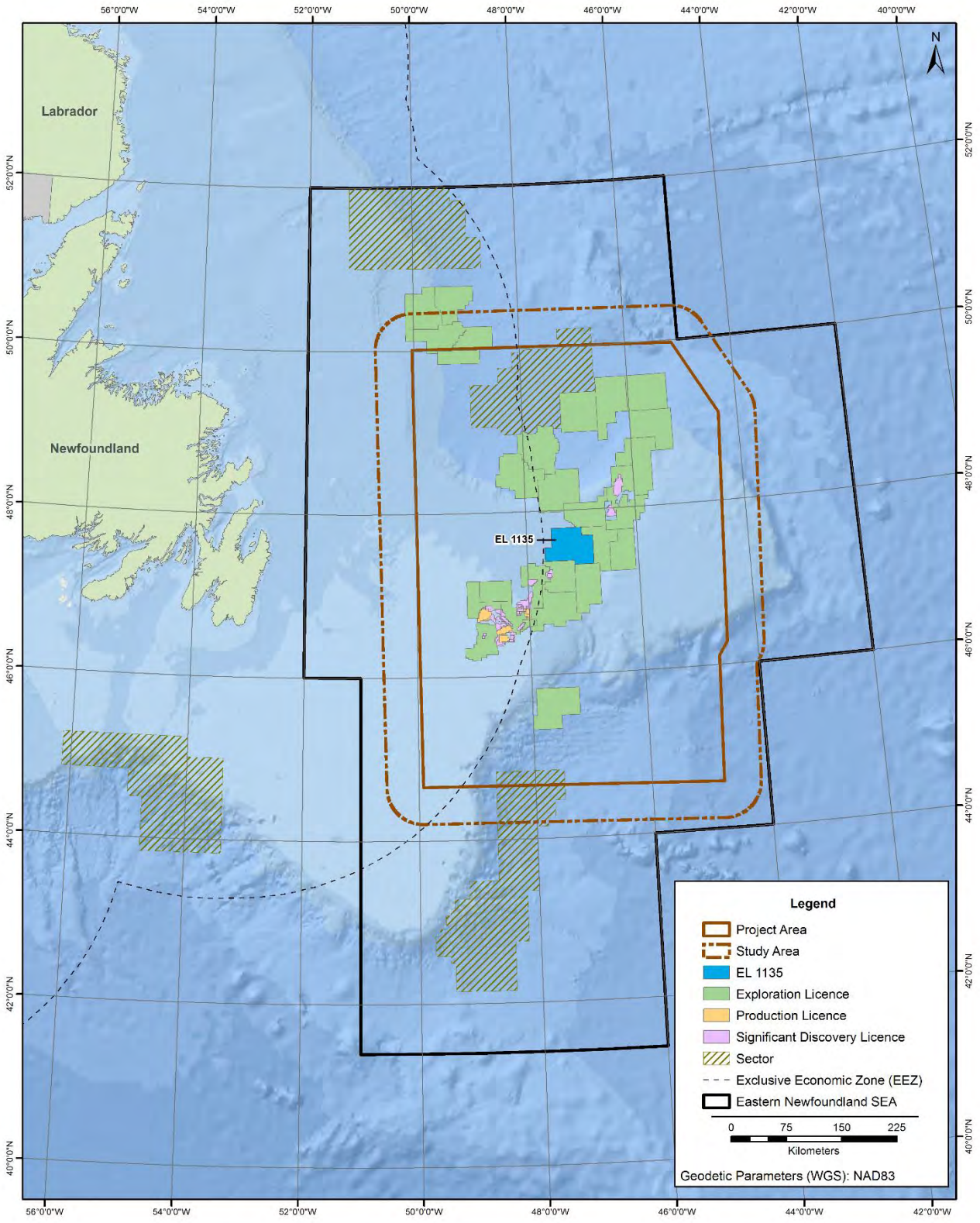
As described in the original EA Report (July 2015), the Project includes the proposed conduct of offshore exploration activities over ExxonMobil Exploration Licences (ELs) and other areas of interest within the Project Area (Figure 2.1) annually over the 2015-2024 period.

The Project Area encompasses the overall marine area within which all Project-related survey equipment use and data-acquisition activity will take place and is located off the eastern coast of the Island of Newfoundland. The Project Area covers an area of 243,787 $km^2$, and as illustrated in Figure 2.1, portions of the Project Area are located within Canada's Exclusive Economic Zone (EEZ), whereas over half is located beyond the 200 nautical mile limit. All Project survey activities and operations, including survey equipment deployment, use and recovery, testing, other data acquisition and seismic survey line turns, will be completed within the identified Project Area boundary. Water depths in the Project Area range from approximately 100 m to 4,700 m.

Planned Project activities include 2D and 3D seismic surveys, as well as wellsite geohazard, geochemical, geotechnical and environmental survey activities. These are described in some detail in Chapter 2 of the EA Report (July 2015), with specific reference to the types of activities being planned for 2019, Section 2.4.2 (Wellsite Geohazard, Geochemical and Environmental) of the EA Report states that:

> *Wellsite geohazard, geochemical and environmental survey activities will also be conducted in order to collect additional information to help determine the hydrocarbon potential of, and/or environmental conditions within, relevant parts of the Project Area.*
>
> *These survey programs involve a variety of activities, the underlying purpose and timing of which is variable. Geochemistry is often associated with exploration for hydrocarbon prospects, wellsite-geohazard and environmental work is undertaken to complete site investigation prior to exploratory drilling. The specific nature, location and timing of these activities in any year will be subject to regulatory approvals, as well as such factors as weather and ice conditions, the location of other marine activities in the region and other considerations. With the exception of geochemical surveys, which are an exploration tool, the timing of these activities will all be dependent upon the exploration results and the number of potential exploration well prospects identified from the 3D seismic data.*

## Figure 2.1 Project Area and EA Study Area (Update Map)



> *The main components of the wellsite geohazard, geochemical and environmental surveys associated with this Project will include:*
>
> - *A site-Survey acquisition Vessel;*
> - *Engineering geophysical equipment including 2D HR seismic;*
> - *Seabed and water column sampling equipment; and*
> - *Shallow seabed geotechnical sampling equipment.*
>
> *The geochemical and associated bathymetric surveys are associated with exploration for prospects. Geochemical and environmental data acquisition may be collected using a towed or ROV mounted seabed camera / video system, grab samplers, gravity or piston core, box corer and water sampler.*
>
> *Site investigation[s] prior to exploratory drilling [will include] geohazard and engineering geophysical data...[collection] using 2D high-resolution reflection seismic, sub-bottom profilers (possibly involving deep tow, mid water tow, hull-mounted or over the side mounted equipment), side-scan sonar, multi-beam echosounder and magnetometers. Core, grab and seabed samples may also be acquired to determine seabed sediment characteristics. For each of these activities, the survey vessel could be either a dedicated survey ship, or involve the equipment being deployed from a vessel of opportunity.*
>
> *Environmental surveys could include metocean water column characterization and environmental effects characterization and environmental baseline studies. Instrumentation could include water samplers, CTD, current meters and wave rider buoy for metocean and seabed grab and core samples for environmental baseline survey. Environmental characterization may also include a biological survey of commercial fish using fish sampling gear such as a commercial groundfish trawl.*

Section 2.5 of the EA Report outlines applicable logistical and personnel requirements for such a survey, whereas Section 2.6 (Project Schedule) notes that:

> *The proposed Project activities will occur within the May 1 to November 30 period for each and all years of the proposed exploration program, which will potentially extend from 2015 to 2024.*
>
> *It is anticipated that all proposed seismic survey activities would occur within these months each year, with the actual timing of data acquisition in any given year being determined at that time based on factors such as local weather, sea state and ice conditions, the nature, timing and intensity of commercial fisheries, and required coordination with other marine activities in this area and elsewhere.*

## 2.2 Planned 2019 Project Activities

Project activities in 2019 could include the completion of seabed survey activities within ExxonMobil operated ELs in the Project Area, (see Figure 2.2). These surveys will be completed at identified locations in the Sackville Spur and Flemish Pass areas off the eastern Grand Bank, and will include:

- Pre-drilling site-investigation / geohazard determination;
- Cold water corals habitat identification surveys; and
- Seabed characterization

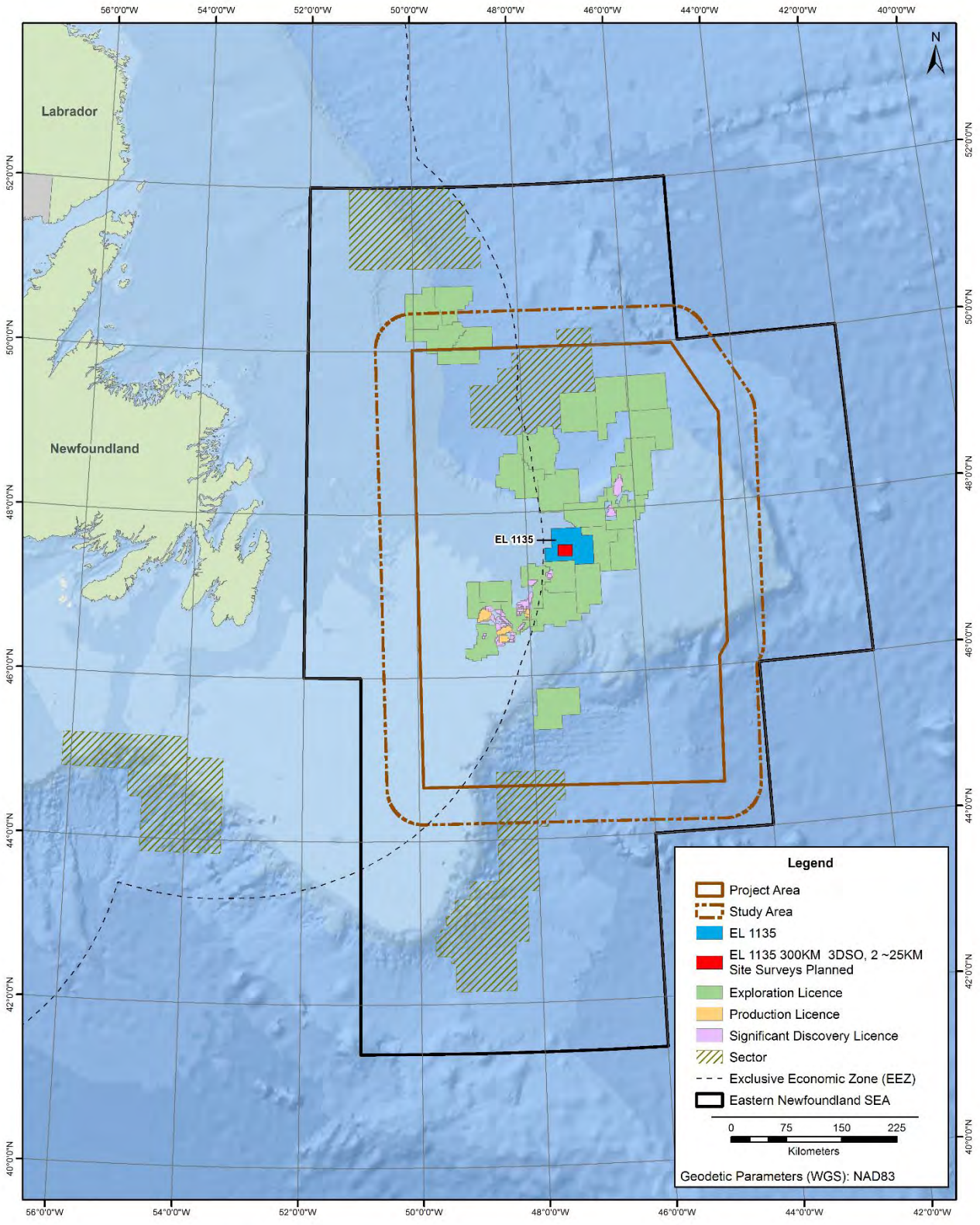
It is anticipated that the 2019 survey activities will commence in late June and they are expected to be completed by late August or early September 2019, for a total planned duration of approximately 45 days depending on final scope and weather conditions. Specifically, planned activities for 2019 are further evaluation for corals and sponges as required by the C-NLOPB and DFO. This EL 1135 Phase 2 survey is scheduled for late June with 10 days to complete depending on scope and weather conditions. High- resolution video transects deployed from an ROV will include surveys around anchor sites that extend at least 50 metres from the planned anchor pattern at the Harp (EL 1135) well location.

Further survey activities for 2019 could also include, Autonomous Underwater Vehicle (AUV), digital high-resolution seismic equipment, towed and vessel mounted engineering geophysical equipment, geotechnical, fisheries and cold-water corals habitat survey equipment, and seabed characterization sampling equipment. These surveys could take within other locations within the project area.

The site-investigation / geohazard survey seismic acquisition equipment suite could consist of:

- Two-Dimensional High Resolution Digital Seismic (2DHR);
- Singlebeam Echosounder (SBES);
- Multibeam Echosounder (MBES);
- Vessel Mounted Sub-Bottom Profiler (SBP1);
- Deep-Towed Sub-Bottom Profiler (SBP2);
- Sidescan Sonar (SSS);
- Magnetometer (Mag);
- Water Column - Sound Velocity Profiler (CTD/SVP), either deployed from the vessel or Moving Vessel Profiler (MVP);
- Ultra Short Base Line subsea instrument navigation (USBL); and
- Water sampler

## Figure 2.2 Project Area and Approximate Locations for 2019 Surveys



In order to obtain high resolution engineering geophysical data for cold water coral habitat identification in deeper water locations, an AUV, instrumented with MBES, SBP1, SSS and a high-resolution camera could be considered.

The equipment planned to be used for associated site-investigation / geohazard survey seabed characterization consists of small volume grab sampler (GS) and seabed cameras. Cameras would be mounted on either a seabed frame, an inspection Remotely Operated Vehicle (ROV) or AUV mounted camera.

To fully utilize the survey vessel, some environmental data acquisition is also being considered, consisting of a number of water samples in the project area.

Specific survey methodologies, survey locations and survey extents are currently being developed and refined as Project planning progresses and will be detailed in ExxonMobil's forthcoming applications to the C-NLOPB for the various authorizations and/or approvals required to complete the program. Key overall survey components and activities are summarized below:

- *Pre-drilling site-investigation / geohazard determination*: This would involve the completion of surveys over approximately 5 km x 5 km areas, centered over identified well-site locations within the EL in question. The survey would involve a line spacing of approximately 100 m - 250 m primary and 500 m secondary. In the case of planned AUV use, the data would be acquired at various AUV altitudes ranging from 6-45 m above the seabed, with the survey equipment including MBES, SBP2, SSS and camera in conjunction with vessel deployed equipment including SVP/CTD, SBES and SBP1. Alternatively, the survey will be completed using a vessel-based equipment suite consisting of SBES, MBES, SBP1, SSS, CTD/SVP.

  The AUV navigation system, obstacle avoidance and predetermined altitude prevent seabed interaction and allow the experienced operator to program and complete the survey to acquire full seabed coverage. The AUV will be battery operated and not use a fuel cell, which will avoid any associated environmental risk. In the very unlikely event of a failure and resulting equipment loss, a recovery plan would be implemented.

- *Fisheries and cold-water corals habitat identification surveys*: This will involve acquiring towed / drift video transect or ROV video transects over the identified well site locations and the modelled drill cuttings dispersal areas. In water depths less than 500 m where the eventual drill rig may be anchored, the anchor locations would also be surveyed and the survey area would be an approximately 5 km x 5 km area centered over the proposed well-site location.

- *Seabed characterization*: This will involve grab sampling and drift video transects at representative areas and in proximity to the identified drill site location, using an equipment suite consisting of GS and underwater camera.

**Survey Vessel**

The survey vessel to be used has yet to be identified and contracted, but it will be suited to the environmental conditions of the Project Area and the planned survey activities and will comply with applicable regulatory requirements.

The survey vessel will use existing shore base facilities in St. John's and a shore based representative will be located in St. John's for the duration of the Project. The crew will be made up of seismic crew (technical and scientific personnel) and vessel crew (ships officers and marine crew). Additionally, there will be two client representatives on-board for the duration of the survey as well as Marine Mammal Observers (MMOs) and a Fisheries Liaison Officer (FLO) as outlined in the EA Report. All on board personnel will have the required certifications specified by applicable legislation and the C-NLOPB.

## 2.3 Consultations

As part of its on-going and planned operations off Eastern Newfoundland, ExxonMobil regularly 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 2019 activities that are described in this EA Update were communicated to the Fish, Food and Allied Workers Union (FFAW-Unifor), One Ocean and fish harvesters through email correspondence on June 18th, 2019.

Input was provided from the Department of Fisheries and Oceans (DFO) on the coral and sponge ROV video data that was acquired during the summer of 2018 at both the EL 1134 and EL 1135 well locations. At the time of the 2018 survey, the exact locations of the wellhead and anchor patterns were not known. These have now been finalized and recommendations from DFO and the C-NLOPB have been made, thus additional ROV video is required to identify any cold water corals and sponges along the entirety of the anchor chains and 50 metres beyond the anchors at the EL 1135 location only.

DFO was contacted via email on July 2nd, 2019, regarding the planned scope of work and justification for additional survey.

Information on the Project and its 2019 activities will continue to be communicated to and discussed with applicable groups through the above described forums.

## 2.4 Evaluation of Planned 2019 Activities in Relation to the Overall Project and EA Scope

As noted above, each of the planned 2019 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 EA Report (July 2015) and the associated EA Addendum and Amendment (May 2016), for example, included and described the equipment and associated activities that would be associated with the completion of wellsite geohazard, geochemical and environmental surveys (Section 2.4.2), as well as outlining the associated 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 Report (Chapter 6) and the EA Addendum and Amendment, 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 effects and associated mitigations measures (as reflected in the EA Report and EA Addendum and Amendment) remain applicable to the nature and scope of the planned 2019 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 EXISTING ENVIRONMENT AND ENVIRONMENTAL EFFECTS ASSESSMENT

The original EA Report (July 2015), subsequent EA Addendum and Amendment (May 2016), and EA Update (April 2018) provided a detailed overview of the existing (baseline) environment within and around the proposed Project and Study Areas, including relevant aspects of the existing physical, biological and socioeconomic environments, and an assessment of the potential environmental effects of the Project.

This Chapter of the 2019 EA Update provides an updated overview of the existing environmental setting for the Project. This includes a description of any new or additional information for the EA Study Area that has become available since the original EA Report was completed, with a particular focus (where possible) on EL 1135. It also provides an analysis of any implications of this new information and the specific nature and scale of the planned 2019 Project activities for the EA's predicted environmental effects, the mitigation measures that have been identified and proposed by ExxonMobil for the Project, and thus for the overall findings and conclusions of the original EA documents referenced above. This discussion is focussed on and structured according to the various Valued Environmental Components (VECs) or associated aspects that were considered and addressed in the original EA Report, namely:

1) Species at Risk
2) Protected and Sensitive Areas, and
3) Marine Fisheries and Other Activities.

In the interests of efficiency and brevity it does not repeat all of the detailed environmental information and analysis provided in the original EA documentation, which should therefore also be referred to as required and relevant.

## 3.1 Marine Fish

### 3.1.1 Species Designation or Listing

There are a number of fish species that have been designated as being at risk, or which have otherwise been identified as being of special conservation concern, that are known or likely to occur in the Study Area, including several that are designated and formally protected under the federal Species at Risk Act (SARA) and/or the Newfoundland and Labrador Endangered Species Act (NL ESA) (Table 3.1). Since the EA Report and associated addenda and updates were completed and submitted there have been additional information available on Atlantic salmon overwintering in marine waters. Therefore, additional information is presented on designatable units / populations that were not previously included in assessments. Since the 2018 EA update, there have not been any changes in species at risk designations for marine fish (Table 3.1).

## Table 3.1 Fish Species at Risk or Otherwise of Special Conservation Concern.

| Species | | Status/Designation[1, 2] | | | | Relevant Population (Where Applicable) |
|---|---|---|---|---|---|---|
| Common Name | Scientific Name | *NL ESA* | *SARA* | COSEWIC | IUCN | |
| Atlantic wolffish | *Anarhichas lupus* | | SC | SC | | |
| Northern wolffish | *Anarhichas denticulatus* | | T | T | | |
| Spotted wolffish | *Anarhichas minor* | | T | T | | |
| American eel | *Anguilla rostrata* | V | | T | E | Global (IUCN) |
| Blue shark | *Prionace glauca* | | | NR | NT | Atlantic (COSEWIC); Global (IUCN) |
| Basking shark | *Cetorhinus maximus* | | | SC | V | Atlantic (COSEWIC); Global (IUCN) |
| Common Lumpfish | *Cyclopterus lumpus* | | | T | | Atlantic (COSEWIC) |
| Alewife | *Alosa pseudoharengus* | | | | LC | Global (IUCN) |
| Black Dogfish | *Centroscyllium fabricii* | | | | LC | Global (IUCN) |
| Atlantic cod | *Gadus morhua* | | | E | V | Newfoundland and Labrador (COSEWIC); Global (IUCN) |
| Cusk | *Brosme* | | | E | | |
| Haddock | *Melanogrammus aeglefinus* | | | | V | Global (IUCN) |
| White hake | *Urophycis tenuis* | | | T | | Atlantic and Northern Gulf of St. Lawrence (COSEWIC) |
| Porbeagle | *Lamna nasus* | | | E | V | Global (IUCN) |
| Shortfin mako | *Isurus oxyrinchus* | | | SC | V | Atlantic (COSEWIC); Global (IUCN) |
| White shark | *Carcharodon carcharias* | | E | E | V | Atlantic (COSEWIC/SARA); Global (IUCN) |
| Roughhead grenadier | *Macrourus berglax* | | | SC | | |
| Roundnose grenadier | *Coryphaenoides rupestris* | | | E | CE | Atlantic and Arctic (COSEWIC); Global (IUCN) |
| Lanternfish | *Myctophidae* | | | | LC | Global (IUCN) |
| Atlantic hagfish | *Myxine glutinosa* | | | | LC | Global (IUCN) |
| American plaice | *Hippoglossoides platessoides* | | | T | | Newfoundland and Labrador (COSEWIC) |

| Species | | Status/Designation[1, 2] | | | | Relevant Population (Where Applicable) |
|---|---|---|---|---|---|---|
| **Common Name** | **Scientific Name** | ***NL ESA*** | ***SARA*** | **COSEWIC** | **IUCN** | |
| Atlantic halibut | *Hippoglossus* | | | | E | |
| Barndoor skate | *Dipturus laevis* | | | | E | Global (IUCN) |
| Smooth skate | *Malacoraja senta* | | | E | E | Funk Island Deep (COSEWIC); Global (IUCN) |
| Spinytail skate | *Bathyraja spinicauda* | | | | NT, V | Global, Northwest Atlantic (IUCN) |
| Thorny skate | *Amblyraja radiata* | | | SC | V | Canada (COSEWIC); Global (IUCN) |
| Winter Skate | *Leucoraja ocellata* | | | E | E | Eastern Scotian Shelf – Newfoundland (COSEWIC); Global (IUCN) |
| 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 |
| | | | | | LC | Global (IUCN) |
| Albacore tuna | *Thunnus alalunga* | | | | NT | Global (IUCN) |
| Atlantic bluefin tuna | *Thunnus thynnus* | | | E | E | Global (IUCN) |
| Bigeye tuna | *Thunnus obesus* | | | | V | Global (IUCN) |
| Acadian redfish | *Sebastes fasciatus* | | | T | E | Atlantic (COSEWIC); Global (IUCN) |
| Deepwater redfish | *Sebastes mentella* | | | T | LC | Northern (COSEWIC); Global (IUCN) |
| Greenland Shark | *Somniosus microcephalus* | | | | NT | Global (IUCN) |
| Spiny dogfish | *Squalus acanthias* | | | SC | V | Atlantic (COSEWIC); Global (IUCN) |

[1] Not at Risk (NR), Least Concern (LC), Vulnerable (V), Near Threatened (NT), Special Concern (SC), Threatened (T), Endangered (E), Critically Endangered (CE)
[2] Multiple designations refer to multiple populations or sub-populations.

Information on marine fish that may occur or migrate through the Project Area is described in Section 4.2.1.6 of the EA Report and 3.1.1.4 of the 2018 EA Update. Since completion of the EA update documentation for the Project, there have been further characterization of use of marine environments by Atlantic salmon.

Movements in marine waters of Atlantic salmon populations (Table 3.1) can be categorized by regional populations. The South Newfoundland population is part of the Insular Newfoundland Population. Atlantic salmon from the Quebec Eastern North Shore, Quebec Western North Shore, Anticosti Island, Inner St. Lawrence, Gaspe-Southern Gulf of St. Lawrence are part of the Gulf of St. Lawrence Population. Atlantic salmon from Eastern Cape Breton, Nova Scotia Southern Upland and Outer Bay of Fundy are part of the Eastern - Southern Nova Scotia and Outer Bay of Fundy Populations. In marine environments, post-smolt and adult salmon typically occur within upper 5-10 m of the water column. Some research with satellite pop-up tags have indicated that adults may use deeper waters (i.e., European salmon have been recorded making dives up to 900 m) (Windsor et al. 2012; Hedger et al. 2017; Strøm et al. 2017). Salmon tagged from Campbellton River in NL were frequently present at depths of more than five meters (Windsor et al. 2012).

Post smolt and adult salmon from these regional populations are all likely to feed and overwinter in the Labrador Sea with a portion congregating off the eastern edge of the Grand Banks south of the Project Area in the spring before completion of their spring spawning migration back to natal rivers (Reddin and Friedland 1993, Reddin and Shearer 1987). These populations, tag recapture studies suggest that post-smolt salmon migrate along the coastal routes off eastern Newfoundland before moving offshore to feeding and overwintering areas (Reddin and Friedland 1993). In the spring, returning adults from these populations would also tend to move into NL coastal waters and then move coastwise in a southerly and then westerly direction along the NL coast (Reddin and Friedland 1993). Furthermore, sampling near the Flemish Pass in winter and summer/autumn did not capture any salmon (Reddin and Shearer 1987) and during the spring low catches (>0.0-1.0 salmon per mile-hour of drift gillnet) of adult salmon were recorded (Reddin and Shearer 1987). Studies using stable isotope signatures of one sea winter (1SW) and multi-sea winter (MSW) salmon give indications of feeding areas in the marine environment (Soto et al. 2018). Salmon from the St. John River, NB were correlated to various feeding areas, the western North Atlantic region as the more likely feeding region for these fish (Soto et al. 2018). These potential feeding areas off the coast of Labrador and northern Newfoundland do not overlap with the Project Area.

Therefore, given the available data, there is likely low interaction with spring migration of adults within and near the Project Area. Potential interactions with the Project are also reduced by the localized and short-term nature of activities, planned mitigation measures to avoid or reduce potential effects, lack of Project interactions with critical habitats, and the highly mobile nature of the species.

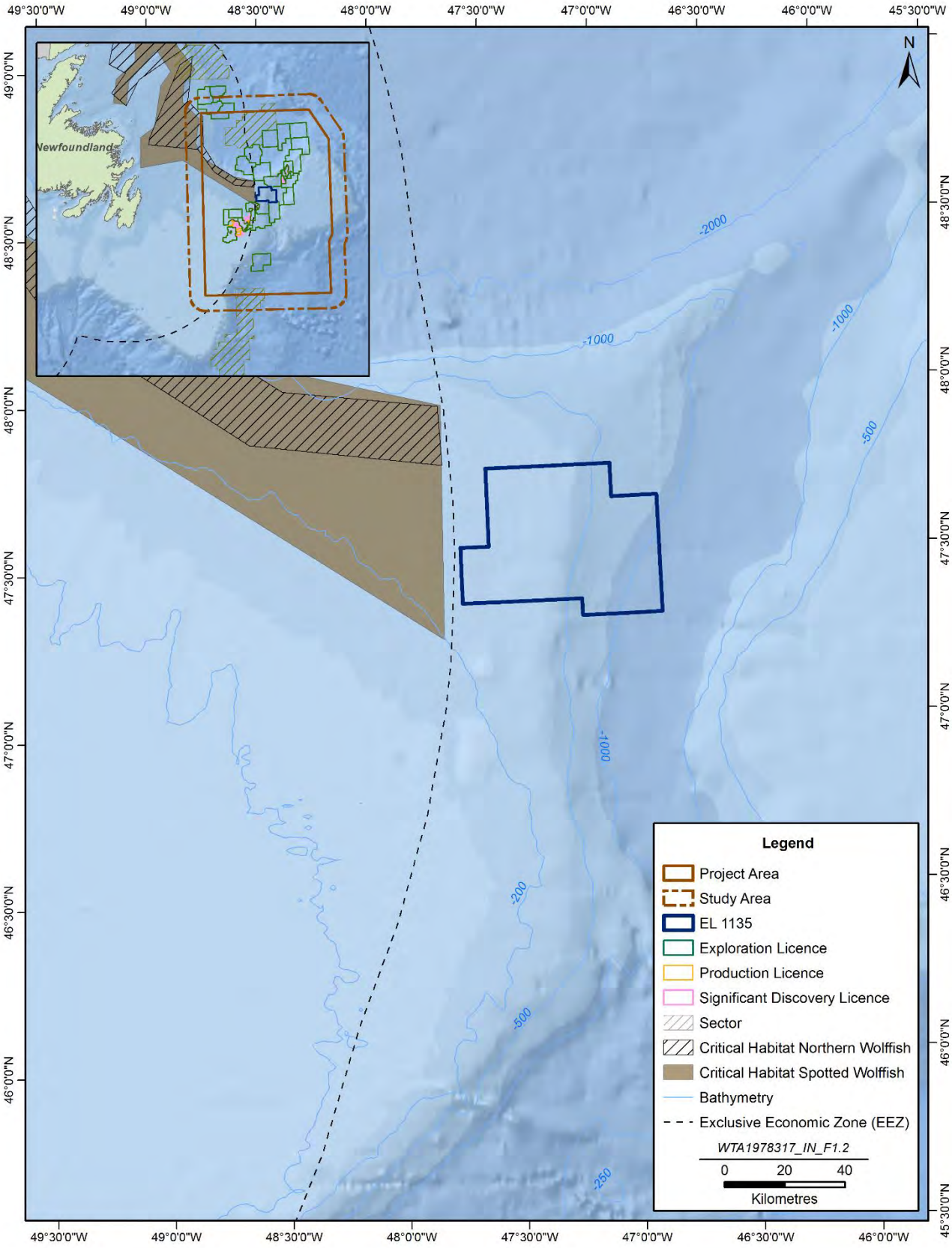
### 3.1.2 Recovery Strategy Updates

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.

New proposed critical habitat for spotted and northern wolffish was set out in the proposed 2018 Recovery Strategy (DFO 2018a) for these species, primarily along the edge of the Grand Banks and Labrador Shelf (Figure 3.1). Critical habitat was delineated using seasonal wolffish presence based on sea bottom temperature and depth to determine optimal habitats in western North Atlantic waters. Northern Wolffish critical habitats are located between 118-636 m depth with sea bottom temperatures of 2.3-5.1ºC and function to support all portions of wolffish life history. Spotted wolffish habitats are located between 82-346 m with sea bottom temperatures of 0.1-4.2ºC and function to support all portions of wolffish life history. No critical habitat has been established for the Atlantic wolffish (DFO 2018a). While there is overlap between the Project Area and spotted and northern wolffish critical habitat in the Project Area, seabed investigation activities will be limited to the EL areas that are outside the proposed critical habitat. Furthermore, Project activities are not likely to result in thermal habitat alteration or habitat destruction that are considered key threats to the critical habitat. Therefore, exploration activities are unlikely to have effects on critical habitat.

These species were also considered and assessed in the EA Report (Section 4.2.1.6 of the EA Report) for potential environmental effects of the Project on this species. As environmental surveys such as seabed investigations are unlikely to have potential effects on Marine Fish and Fish Habitat and with the implementation of planned mitigation measures, the Project is not likely to result in significant adverse effects on northern and spotted wolffish.

## Figure 3.1 Proposed critical habitat for northern and spotted wolffish (DFO 2018a)



### 3.1.3 Marine / Migratory Birds

#### 3.1.3.1 Species Designation or Listing

Very few avian species at risk or species of conservation concern are likely to occur in the Study Area. The Ivory Gull is found almost exclusively in marine environments, and although its breeding distribution (and critical habitat) is in the Arctic, it regularly occurs in small numbers in the waters off Eastern Newfoundland, typically around pack ice. Two waterfowl species at risk, the Barrow's Goldeneye and Harlequin Duck, both occur in the marine environment, particularly outside of the breeding season. Like other waterfowl species, they prefer coastal areas and so are considered unlikely to occur in the Study Area. Red-necked Phalaropes, assessed by COSEWIC as a species of conservation concern, were seen in small numbers during ECSAS surveys in offshore waters from April to December. Other avian SAR that occur in Newfoundland are shorebirds and land birds are unlikely to be found in the Study Area except on a transient basis during the fall months.

Species of conservation concern in Newfoundland and Labrador that do not inhabit coastal or offshore environments, or that only migrate over the ocean in the daytime, are not assessed further in this section. These include the Red Crossbill (*percna* subspecies), which is a non-migratory forest dweller (EC 2006); and three diurnally migrating landbirds, the Rusty Blackbird (Avery 2013), Chimney Swift (Steeves et al 2014) and Barn Swallow (Brown and Brown 1999).

An updated summary of avian species that occur in the province, including information on their habitat preferences and potential to occur in the Study Area, is provided in Table 3.9. Since the EA Update was completed and submitted, updated information on the distribution of Ross's gull (Maftei et al. 2015) warrents consideration as avian species at risk that may interact with the Project Area (see shaded rows in Table 3.2). Therefore, additional biological and ecological information is provided below for this species.

**Table 3.2 Avian Species at Risk and their Likelihood of Occurrence in the Study Area**

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| Barrow's Goldeneye (Eastern pop.) | Vulnerable | Special Concern | Special Concern | May breed in Newfoundland. Moults and winters in small numbers off the coast of Eastern Canada, often in groups with Common Goldeneye. Small numbers have been reported wintering at Port Blandford and Newman Sound in Terra Nova National Park, as well as Traytown Bay, St. Mary's Bay, and Spaniard's Bay | Unlikely, due to their affinity for coastal habitats. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | (Schmelzer 2006). Known to congregate in relatively small geographic areas in important shipping corridors, therefore considered to be particularly vulnerable to being affected by accidental spills (Schmelzer 2006). | |
| Harlequin Duck (Eastern pop.) | Vulnerable | Special Concern | Special Concern | Breeds in fast-flowing streams and congregate in moulting sites in the late summer to fall. May breed in Bay du Nord River in southeastern Newfoundland (Bird Studies Canada 2017). Found in coastal marine environments throughout fall and winter along rocky coastlines, subtidal ledges, and exposed headlands. Non-breeding individuals may be found year-round at Cape St. Mary's, one of few known moulting sites in the province (Bird Studies Canada 2017; NLDEC 2017). | Unlikely, due to their affinity for coastal habitats. |
| Ivory Gull | Endangered | Endangered | Endangered | Breeds in the far north and winters offshore. Spend almost all of their time in the marine environment, including within the Study Area. Present in small numbers in the waters off Eastern Newfoundland, usually among pack ice. | Potentially present. Because they are typically found among pack ice, interactions with Project activities are unlikely. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | Rarely seen on the coast of the Northern Peninsula and ashore (Stenhouse 2004; NLDEC 2017). | |
| Ross's gull | None | Threatened (Schedule 1) | Threatened | Known to nest in very small numbers at a few locations in Arctic Canada with most of the world population nesting in Arctic Russia (COSEWIC 2007a). Geolocators placed on Ross's gulls at a nesting site in the high Arctic of Nunavut showed that some of them spent October–May in the Labrador Sea as far south as 50°N. One bird's track showed it within Orphan Basin and followed the shelf edge close to the Sackville Spur (Maftei et al. 2015). | Maftei et al. (2015) indicates Ross's gull can occur at least occasionally in the northern part of the Project Area. |
| Piping Plover (*Melodus* ssp.) | Endangered | Endangered | Endangered | During the nesting season, found on sandy beaches along the coast. In Newfoundland, breeding population is concentrated in the southwest and western portions of the Island (NLDEC 2017); major breeding areas include Grand Bay West to Cheeseman Provincial Park and Big Barasway, and nesting has also been observed in Codroy Valley Estuary (Bird Studies Canada 2017). Has been reported at Deadman's Bay | Unlikely, due to their affinity for coastal habitats. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | near the Cape Freels Coastline IBA in northeastern Newfoundland. Unlikely to be affected by typical project activities, although accidental spills near breeding habitat could potentially be harmful. | |
| Red Knot (*rufa* ssp.) | Endangered | Endangered | Endangered | Found on open sandy inlets, coastal mudflats, sand flats, salt marshes, sandy estuaries and areas with rotting kelp deposits during fall migration, from August 1st to October 30th (Garland and Thomas 2009; NLDEC 2017). Sightings have been reported around almost the entire coast of Newfoundland, mostly on the west coast (Baker et al 2013). In Atlantic Canada Shorebird Survey, they are considered regular or occasional species during fall migration at Bellevue Beach, Cape Freels, and around the Codroy Valley Estuary, and they are rare visitors at other survey sites (EC 2009). | Unlikely, due to their affinity for coastal habitats. |
| Buff-breasted Sandpiper | none | none | Special Concern | Arctic breeders; during fall migration, considered to be a rare migrant in the province (COSEWIC 2012a). | Unlikely, due to their affinity for coastal habitats. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | Occasionally observed in Atlantic Canada Shorebird Surveys at St. Shott's Sod Farm near the southern shore of the Avalon Peninsula and at Cape Bonavista. Reported in small numbers at other survey sites (EC 2009). | |
| Red-necked Phalarope | none | none | Special Concern | Outside the breeding season, found in coastal marine environment (Rubega et al 2000). Surface feeders, often congregating in areas such as upwellings with higher prey densities. In the Atlantic Canada Shorebird Survey, considered rare visitors at Cape Spear and at Bonavista/ Cape Bonavista (EC 2009). | Potentially present. Seen in small numbers during ECSAS surveys within the Study Area, although scarce in the winter and spring (CWS 2017). |
| Peregrine Falcon | Vulnerable | Special Concern | Not At Risk | Migrates along the coast of Newfoundland during the fall (particularly the west coast), preying on concentrations of migrating shorebirds. Peregrine Falcon sightings have been reported in the fall near Port-aux-Basques, St. Pierre et Miquelon, and on the Bonavista Peninsula, and year-round (most frequently during the fall) on the Avalon Peninsula (White et al 2002). | Unlikely to occur regularly in the Study Area. May be an occasional vagrant during fall migration. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| Common Nighthawk | Threatened | Threatened | Threatened | Nests in open areas (e.g. coastal sand dunes and beaches, logged or slashburned areas of forest sites, woodland clearings, grassland habitat, farm fields, open forests, rock outcrops, and flat gravel rooftops).<br>Does not breed in insular Newfoundland (Brigham et al 2011) but migrates through province. | Unlikely to occur regularly in the Study Area. May be an occasional vagrant during fall migration. |
| Bank Swallow | none | Threatened | Threatened | Bank Swallows are colonial, often nesting in sandy banks created through coastal erosion; therefore, potentially in close proximity to the marine environment during the breeding season. Diurnal migrants (Garrison 1999).<br>Within the province, breeds primarily in southwestern Newfoundland (Warkentin and Newton 2009); however, sightings have also been reported in eastern Newfoundland (Garrison 1999). | Unlikely, due to their affinity for coastal habitats. As diurnal migrants, they are less susceptible to disorientation from offshore artificial light sources. |
| Gray-cheeked Thrush (*minimus* ssp.) | Threatened | none | Candidate Species (low priority) | Nests in dense coniferous forest habitat throughout insular Newfoundland and overwinters in South America, migrating nocturnally (Lowther et al 2001).<br>Most common on the Northern Peninsula and | Unlikely to occur regularly in the Study Area. May be an occasional vagrant during fall migration. |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | along the northeast coast, as well as the northern Avalon Peninsula (Endangered Species and Biodiversity Section 2010). Has also been reported in Placentia Bay (Endangered Species and Biodiversity Section 2010) and breeds in Terra Nova National Park (Bird Studies Canada 2017). An inland species, therefore unlikely to be affected by offshore activities at most times of year. | |
| Olive-sided Flycatcher | Threatened | Threatened | Threatened | Found in boreal forest habitat, particularly open areas such as wetlands with tall trees and snags. Migrates to south and central America to overwinter (Altman and Sallabanks 2012). Breeds throughout insular Newfoundland and Southern Labrador (COSEWIC 2007b), and in Eastern Newfoundland it has been reported at several locations on the Avalon Peninsula as well as at Terra Nova National Park (Altman and Sallabanks 2012). | Unlikely to occur regularly in the Study Area. May be an occasional vagrant during fall migration. |
| Bobolink | Vulnerable | Threatened | Threatened | Nests in agricultural and natural grasslands and migrates to South America in the fall (Renfrew et al | Unlikely to occur regularly in the Study Area. May be an occasional |

| Species | Provincial Status | Federal Status | | Habitat and Distribution in Newfoundland | Potential Presence in Study Area |
|---|---|---|---|---|---|
| | | SARA Schedule 1 Listing | COSEWIC Assessment | | |
| | | | | 2015). Breeding has been reported at Codroy Valley (Bird Studies Canada 2017), and there have been sightings on the Avalon Peninsula and Terra Nova National Park (Renfrew et al 2015). | vagrant during fall migration. |
| Short-eared Owl | Vulnerable | Special Concern | Special Concern | Typically nests in coastal barrens and grasslands (Wiggins et al 2006), and suitable habitat occurs in much of coastal Newfoundland. Sightings have been reported throughout the eastern portion of the Island from Wadham Islands to the Avalon and Burin Peninsulas, and near Port-aux-Basques and Codroy Valley in southwestern Newfoundland, mostly in the summer months (Schmelzer 2005; Wiggins et al 2006). | Unlikely, due to their affinity for coastal habitats. |

The majority of Ross's Gull are known to nest in Arctic Russia with small numbers that breed in the Canadian Arctic Archipelago (COSEWIC 2007a; Gilg et al. 2016). The total known breeding population in any single year may range from 0-10 pairs and may be reflective of recent population expansion into Canadian Arctic areas (COSEWIC 2007a, Royston and Carr 2014). In marine waters, this avifauna species is associated with pack ice. Geolocators placed on Ross's gulls at a nesting site in the high Arctic of Nunavut showed that some of them spent October–May in the Labrador Sea as far south as 50°N near the northern boundary of the Study Area. One bird's track showed it within Orphan Basin and followed the shelf edge close to the Sackville Spur (Maftei et al. 2015) indicating that this species can occur at least occasionally in the northern part the Project Area. Considering the remote breeding sites, low population, primarily Arctic distribution, and occasional occurrence in the Project Area, interactions with the Project are considered low. Mitigation measures (Section 5.3 of the EA Report) will be implemented to reduce potential environment effects of Project Activities on Marine and Migratory

birds including species at risk such as Ross's Gull. Potential interactions with the Project are also reduced by the localized and short-term nature of activities, planned mitigation measures to avoid or reduce potential effects, lack of Project interactions with critical habitats, and the highly mobile nature of the species.

#### 3.1.3.2 Recovery Strategy Updates

New proposed critical habitat for red knot was set out in the 2017 Recovery Strategy and management plan (ECCC 2017) for this species. Currently, breeding critical habitat has not been delineated at this time as habitat use and breeding distribution is poorly defined in Arctic Canada. Therefore, critical stopover habitat necessary for foraging and roosting has been identified for mitigation against population threats. Critical stopover habitat can be characterized as muddy, sandy or rocky coastal marine and estuarine habitats with large intertidal flats and seaweed. Critical habitat is located in western (e.g., Alberta, Saskatchewan), northern (e.g., Hudson Bay, and eastern (e.g. Gulf of St. Lawrence) areas. Therefore, Project activities in the offshore are not predicted to interact with critical habitats or with this species due to their affinity for coastal habitats.

### 3.1.4 Marine Mammals and Sea Turtles

#### 3.1.4.1 Species at Risk

A number of marine mammal and sea turtle species at risk (protected under *SARA*) and species assessed by COSEWIC as being of conservation concern, occur in the waters offshore Eastern Newfoundland (Table 3.3). The provincial *NL ESA* does not list any marine mammals or sea turtles. Since the original EA Report and 2018 EA Update was completed and submitted there have been changes in species designations for several species, as follows (see shaded rows in Table 3.3).

Since the EA Update was completed and submitted, updated information on the distribution of Bowhead Whale warrants consideration of this marine mammal as a species at risk that may interact with the Project Area (see shaded rows in Table 3.3). Therefore, additional biological and ecological information is provided below for this species.

**Table 3.3 Marine Mammal and Sea Turtle Species at Risk and their Likelihood of Occurrence in the Study Area**

| Species | Federal Status | | Habitat and Distribution | Potential Presence in Study Area |
|---|---|---|---|---|
| | *SARA* Schedule 1 Listing | COSEWIC Assessment | | |
| Blue Whale (Atlantic Population) | Endangered | Endangered | Found in coastal and pelagic waters, frequently at shelf edge where food production is high (Schoenherr 1991). Present in all oceans except the Arctic (Reilly et al 2008). Critical habitat in the estuary and Gulf of St. Lawrence is currently being identified for the species (DFO 2016). | Present in small numbers throughout the year; most common in the winter and early spring. |
| Fin Whale | Special | Special | Coastal shelf edge and offshore | Present year- |

| Species | Federal Status | | Habitat and Distribution | Potential Presence in Study Area |
|---|---|---|---|---|
| | *SARA* Schedule 1 Listing | COSEWIC Assessment | | |
| (Atlantic population) | Concern | Concern | (COSEWIC 2005). World-wide distribution; most abundant at temperate and polar latitudes (Reeves et al 2002). Typically found in areas with high prey concentration (e.g., the Grand Banks) in the summer months. | round, most common in the summer months. |
| North Atlantic Right Whale | Endangered | Endangered | Prefers waters 100 – 200 m deep with surface temperatures between 8 and 15°C (Kenney 2001). Distribution related to presence and abundance of prey species. Aggregate in five seasonal habitat areas along the east coast of North America, including two designated critical habitat areas in Canada: the lower Bay of Fundy and Roseway Basin on the Scotian Shelf (Brown et al 2009). | Uncommon in Study Area; most likely to be present in the summer months. |
| Bowhead Whale (Eastern Canada-West Greenland population) | None | Special Concern | Bowhead whales are commonly found in the Arctic Ocean, and though the NL Labrador region was part of their historical range, hunting has depleted this population to the point where they are generally no longer found in the region (COSEWIC 2009) Bowhead whales have been sighted in the waters off the coast of NL in Rattling Brook, Trinity Bay, and Witless Bay | Extremely unlikely, reports as far south as Newfoundland are rare |
| Northern Bottlenose Whale (Davis Strait-Baffin Bay-Labrador Sea population; Scotian Shelf population) | none (Davis Strait-Baffin Bay-Labrador Sea population) Endangered (Scotian Shelf population) | Special Concern (Davis Strait-Baffin Bay-Labrador Sea population) Endangered (Scotian Shelf population) | Deep-diving species found in waters 800 - 1500 m deep. In western North Atlantic, occur from Baffin Island to New England (Taylor et al 2008a). It is unclear to which population individuals observed in the Study Area belong; however, a recent observation of 50 individuals in the Sackville Spur area suggest there may be potentially a previously unknown population (CBC 2016). | Potentially present in small numbers in the area year round; most sightings have been in the spring and summer. |

| Species | Federal Status | | Habitat and Distribution | Potential Presence in Study Area |
|---|---|---|---|---|
| | *SARA* Schedule 1 Listing | COSEWIC Assessment | | |
| | | | Davis Strait population seemingly tends to migrate north to south, although patterns are not consistent (Reeves et al 1993), whereas Scotian Shelf population is apparently non-migratory. Three marine canyons, all along the Scotian Shelf, have been identified as critical habitat for the Scotian Shelf population (DFO 2010). | |
| Sowerby's Beaked Whale | Special Concern | Special Concern | Deep-diving species found at continental edges and slopes in depths of 550 - 1500 m or more. Seasonal movements unknown. Found in cold North Atlantic waters, from Massachusetts to Labrador (Taylor et al 2008b). | May be present year-round in deep water habitats. |
| Beluga Whale (St. Lawrence Estuary population) | Endangered | Endangered | Coastal species (ACS 2006). Concentrated near the outlet of the Saguenay River in summer; in the winter months, they disperse from estuarine habitats, regularly occurring as far downstream as the western end of Anticosti Island (COSEWIC 2014). Critical habitat has been identified in the St. Lawrence Estuary and lower reaches of the Saguenay River (DFO 2012a). | Very rare in the Study Area; seldom range far from the St. Lawrence estuary. |
| Killer Whale (Northwest Atlantic / Eastern Arctic population) | none | Special Concern | Nearshore and pelagic environments. Cosmopolitan distribution. Concentrated in areas of high productivity (Forney and Wade 2006). | Likely present; small numbers have been observed in the area at all times of year. |
| Harbour Porpoise | none | Special Concern | Coastal shelf, bays and estuaries, but occasionally offshore (Hammond et al 2008). Found in cold waters throughout the northern hemisphere (Hammond et al 2008). Seasonal movements poorly known. | Fairly common in the Study Area, possibly present year-round. |

| Species | Federal Status | | Habitat and Distribution | Potential Presence in Study Area |
|---|---|---|---|---|
| | *SARA* Schedule 1 Listing | COSEWIC Assessment | | |
| Atlantic Walrus (Central - Low Arctic population) | none | Special Concern | Require shallow open areas with substrate supporting a productive bivalve community, and suitable ice or land nearby upon which to haul out (COSEWIC 2017). Nova Scotia-Newfoundland-Gulf of St. Lawrence population extinct; species is now restricted to Arctic to sub-Arctic regions. | Extremely unlikely. Single extralimital report in Study Area (OBIS 2017). |
| Leatherback Sea Turtle (Atlantic population) | Endangered | Endangered | Typically in coastal shelf waters with depths of less than 200 m. Ranges from tropical to sub-polar regions (COSEWIC 2012b) and undertakes extensive migrations between feeding areas and to tropical nesting areas (Wallace et al 2013). To date, critical habitat has not been identified; however, DFO (2012b) observed three high-use feeding areas in Canadian waters, none within the Study Area. | Likely present in small numbers in the Study Area from April to December. |
| Loggerhead Sea Turtle | Endangered | Endangered | Found in oceanic and near-shore zones of temperate and tropical Atlantic, Pacific and Indian Oceans, and nest on beaches in subtropical and tropical climates (COSEWIC 2010). In Atlantic Canada, most abundant in spring to fall, and generally associated with the Gulf Stream. | Potentially present in small numbers in the spring and summer months. |

Bowhead whales live primarily in arctic waters with a circumpolar distribution, but very rare sightings have been reported in Newfoundland and even as far as Maine (Accardo et al. 2018). It is roughly estimated that there are approximately 10,000 individuals that are part of the Eastern Canada-West Greenland population that covers 1 million square kilometers. Individuals summer in the western Baffin Bay, high arctic regions, northwestern Hudson Bay and off west Greenland. Winter migration takes 2-3 months, where they occupy areas with unconsolidated pack ice in the Hudson Strait, southern Baffin Bay, and off west Greenland (COSEWIC 2009). Current threats to this species include predation, anthropgenic noise, entanglement, vessel strikes and pollution. In consideration of the Bowhead whale's primarily Arctic distribution and rare occurrences in Newfoundland waters, interactions with routine Project activities are considered highly unlikely.

#### 3.1.4.2 Recovery Strategy Updates

There have been no new management plans for species recovery for any at risk marine mammals or sea turtles in the Study Area since the EA Update was completed (Government of Canada 2019).

### 3.1.5 Environmental Effects Assessment

As illustrated previously in Section 2.4, the 2019 survey activities that will be undertaken as part of the Project are in keeping with the nature and scope of those described and assessed in the original EA and will occur well within the previously defined and considered EA Study Area.

Project activities within the 2019 survey areas have the same interactions on secure species as with species at risk. As such, potential environmental issues or interactions on species at risk were considered and addressed in the original EA report. Furthermore, additional species at risk detailed in this EA Update have low potential for interaction with Project activities as they have low or unlikely distribution within the Project Area. Critical habitats for species at risk that have been recently identified are also well outside Project activities for the 2019 surveys and are therefore not likely to interact with the Project. Therefore, there are no likely 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. All of the mitigation measures and commitments outlined in the original EA Report (see Section 5.3, with further details on some measures in the subsequent EA Addendum and Amendment) would remain applicable and will continue to be implemented and adhered to by ExxonMobil in planning and implementing this Project. The Project is still not likely to result in significant adverse environmental effects on marine fish, marine and migratory birds, marine mammal and sea turtle species at risk.

## 3.2 Protected and Sensitive Areas

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

### 3.2.1 Existing Environment Update

Protected and sensitive areas within or near the Study Area were described and mapped in Section 4.2.4 of the original EA Report, with additional details provided in the 2018 Environmental Assessment update for (EMCP 2018). Where overall information on the nature and definition of various types of areas, and the processes for their identification and designation was provided in the original EA Report and the 2018 update, it is not repeated in this section.

This current section focuses on providing an update on protected and sensitive areas in and around the Project Area and Study Area, as well as in other adjacent marine (offshore and coastal) areas of Eastern Newfoundland, to provide context and to illustrate the general proximity of the Project to these areas in the larger surrounding environment in preparation for an ROV coral survey in 2019.

This update provides new information on Marine Protected Areas (MPAs), Marine Refuges, United Nations Convention on Biological Diversity (UNCBD) Ecologically and Biologically Significant Areas (EBSAs), Vulnerable Marine Ecosystems (VMEs), Northwest Atlantic Fisheries Organization (NAFO) Fisheries Closure Areas (FCAs) and Significant Benthic Areas (SBAs). No changes have been identified for Marine Refuges, Federal Fisheries Closure Areas within Canada's Exclusive Economic Zone (EEZ),

Migratory Bird Sanctuaries (MBS), National Wildlife Areas or Marine Wildlife Areas (MWAs), Preliminary Representative Marine Areas (RMAs) or National Marine Conservation Areas (NMCAs). The updated Canadian EBSAs are not described here as the relevant information is not yet available (Wells, N., 2019 pers. Comm.).

#### 3.2.1.1 Canadian (Federally) Identified and/or Protected Areas

Various processes are used to identify and potentially protect marine and coastal ecosystems in Canada, as illustrated in the sections that follow. These protective measures are led by various federal government departments and agencies including DFO, Parks Canada and Environment and Climate Change Canada.

### 3.3 Marine Protected Areas and Areas of Interest

Marine Protected Areas (MPAs) and Areas of Interest (AOIs) are discussed in the original EA Report and in the 2018 update (EMCP 2018). Four MPAs are located off Newfoundland and Labrador. These include Eastport Round Island, Eastport Duck Islands, Gilbert Bay and Laurentian Channel off the coast of southern Newfoundland, which was designated as an MPA in April 2019 (Table 3.4).

The Laurentian Channel MPA Regulations provide two levels of protection (Figure 3.4). Recreational fishing, commercial fishing and oil and gas exploration and development are prohibited throughout the MPA. Anchoring and installation of submarine cables are prohibited in two Core Protection Zones (DFO 2019a). EL 1135 does not intersect with the Laurentian Channel MPA.

**Table 3.4 Laurentian Channel MPA**

| MPA | Rationale for Identification/Designation |
|---|---|
| Laurentian Channel | A deep submarine valley that provides critical habitat for a variety of species including black dogfish, juvenile smooth skate, porbeagle and basking sharks. The MPA includes one of two known mating grounds for porbeagle sharks. Northern wolffish and the leatherback sea turtle (species at risk) have been found in the area. At least 20 of whale and dolphin species have been observed in the area. The MPA has the highest sea-pen concentrations in the NL Shelves bioregion. |
| Source: DFO (2019a) | |

### 3.4 Marine Refuges

In December 2017, DFO identified seven Marine Refuges off the coast of Nunavut and NL to protect portions of sensitive and productive marine habitat and other areas have more recently been designated as Marine Refuges. As of April 2019, DFO has designated 14 Marine Refuges in NL waters, 11 of which are in the NL Shelves Bioregion (DFO 2019b). The NL Shelves Bioregion Marine Refuges are shown in Table 3.5. EL 1135 does not intersect with any Marine Refuges (Figure 3.2).

**Table 3.5 Marine Refuges**

| Marine Refuge | Rationale for Identification/Designation |
|---|---|
| Northeast Newfoundland Slope Closure | All bottom contact fishing activities are prohibited to protect corals and sponges and contribute to long-term biodiversity |

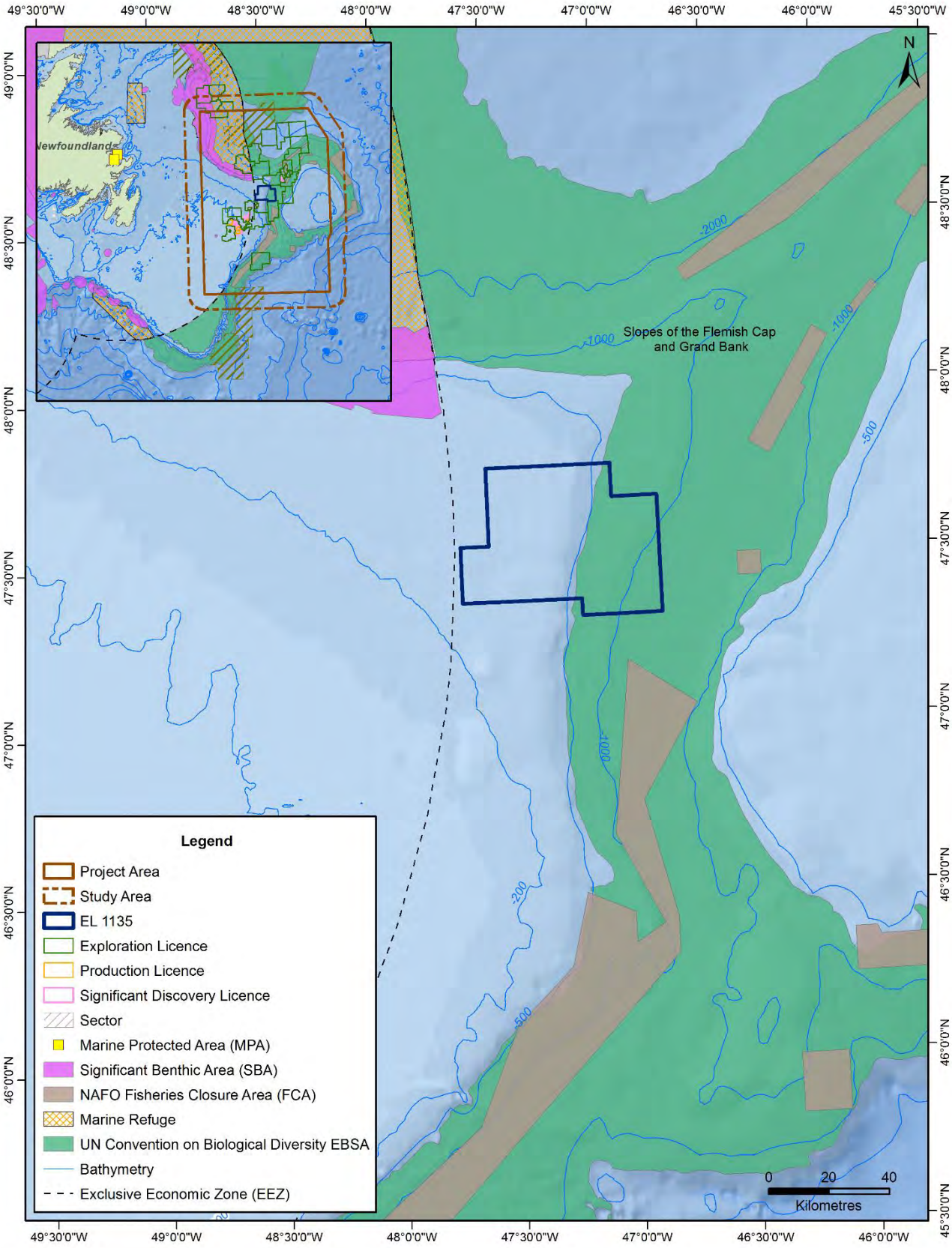
| Marine Refuge | Rationale for Identification/Designation |
|---|---|
| | conservation. |
| Division 3O Coral Closure | All bottom fishing activities are prohibited to protect corals and sponges. |
| Penguin Islands Lobster Area Closure | All lobster fishing is prohibited to increase lobster spawning and egg production. |
| Gooseberry Island | |
| Glovers Harbour Lobster Area Closure | |
| Mouse Island Lobster Area Closure | |
| Gander Bay Lobster Area Closure | |
| Funk Island Deep Closure | Bottom trawl, gillnet and longline fishing activities are prohibited to conserve benthic habitat and Atlantic cod habitat. |
| Hawke Channel Closure | Bottom trawl, gillnet and longline fishing activities are prohibited to conserve benthic habitat and Atlantic cod habitat. |
| Hopedale Saddle Closure | All bottom-contact fishing activities are prohibited to protect corals and sponges and contribute to long-term biodiversity conservation. |
| Hatton Basin Conservation Area | All bottom-contact fishing activities are prohibited to conserve sensitive benthic areas. |
| Source: DFO (2019b) | |

## 3.5 Significant Benthic Areas

DFO has defined fours types of Significant Benthic Areas (SBAs) in the NL Shelves Bioregion. These areas include aggregations of sea pens, sponges, small gorgonian corals and large gorgonian corals that form habitat for other species. The definition excludes non-aggregating species such as black corals and bryozoans. Sea pens are feather-like soft suspension feeders that anchor to soft bottom substrates (DFO 2017). Sponges are found at depths of 3,000 m or less along continental shelves, slopes, canyons and deep fjords. While the distribution of deep-water corals is patchy and influenced by various conditions, gorgonians grow mainly on stable boulders and bedrock but may also anchor in soft sediments (DFO 2018b).

Prior to 2000, the known distribution of benthic species was based on reports from fish harvesters. Presently, DFO conducts surveys using deep-sea trawls and remotely operated vehicles to identify important benthic areas (DFO 2018c). DFO is also using modelling to predict SBAs in Eastern Canada including the NL Shelves Bioregion. In recent modelling exercises, most of the shelf and slopes off Labrador were classified as likely to have sponge presence and the highest predicted sponge presence probabilities occurred along the Labrador Slope and Saglek Bank. The highest predicted presence probability for sea pens occurred in the Laurentian Channel and on the slope of the Northeast Newfoundland Shelf. The highest predicted presence probability of large gorgonian corals occurred of the edge of Saglek Bank and Slope in Northern Labrador. The highest predicted small gorgonian presence probabilities occurred along the southwest slope of the Grand Banks (Kenchington et al 2014). EL 1135 does not intersect with any of the identified SBAs (Figure 3.2).

## Figure 3.2 Updated Special Areas Intersecting with EL1135



### 3.5.1 Internationally Identified and/or Protected Areas

In addition to areas identified and designated under applicable Canadian (federal and/or provincial) legislation and processes, various areas have also been identified by international jurisdictions and processes. In addition, some coastal and inland areas of Eastern Newfoundland have been identified as globally, continentally or nationally significant. New information is provided on the Convention on Biological Diversity EBSAs and NAFO FCAs. DFO updated the VME areas off Newfoundland in 2016 but this information is not yet available.

#### 3.5.1.1 UN Convention on Biological Diversity EBSAs

In 1992, Canada ratified the United Nations Convention on Biological Diversity, which became effective in December 1993. The Convention is identified as an important step towards conservation of global biodiversity. Various ocean habitat areas off eastern Newfoundland and Labrador were identified as EBSAs in the 2018 update (EMCP 2018). An additional EBAS has been identified (Table 3.6). EL 1135 does not intersect with this EBSA but does intersect with the Slopes of the Flemish Pass and Grand Bank EBSA (Figure 3.2).

**Table 3.6 Convention on Biological Diversity EBSAs**

| EBSA | Rationale for Identification/Designation |
|---|---|
| Southeast Shoal and Adjacent Areas on the Tail of the Grand Bank | Southeast Shoal is an ancient beach relic that provides a unique offshore capelin-spawning ground and supports a nursery ground for yellowtail flounder, spawning areas for depleted American plaice, depleted Atlantic cod and striped wolfish (Species of Special Concern under SARA). Unique populations of blue mussels and wedge clams are found in the area. Abundant forage fish results in an important feeding area for cetaceans (e.g., humpback and fin whales, and large numbers of seabirds. |
| Source: UNCBD (2019) | |

#### 3.5.1.2 NAFO Fisheries Closure Areas

Portions of VMEs in the NAFO Regulatory Area are closed to protect benthic species and VME features such as seamounts from bottom contact fisheries. NAFO FCAs are discussed in the original EA Report and the 2018 update (EMCP 2018). The Eastern Flemish Cap (14) NAFO FCA was closed to bottom fishing in 2017 but this prohibition has been removed (NAFO 2019). EL 1135 does not intersect with any NAFO FCAs (Figure 3.2).

### 3.5.2 Environmental Effects Update

The identified protected and sensitive areas within and near the Study Area were described and mapped in Section 4.2.4 of the original EA Report. Updated (new or amended) information (where available and relevant) has been provided in the preceding section. As discussed in Section 5.9 of the 2015 EA Report, in the 2018 Amendment and re-confirmed in Chapter 2 of this update, planned Project activities will occur in an offshore area hundreds of kilometres from shore. They will therefore not occur within, or otherwise interact directly with, any of the existing provincial or federal Parks, Ecological Reserves, Wildlife Reserves, MPAs, MBSs, IBAs or other areas that have been designated as protected or sensitive on or around the Island of Newfoundland. The overall Project and Study Areas intersect with a number of identified protected or sensitive areas in the offshore environment, including several EBSAs

(Federal and UN Convention), Marine Refuges, NAFO FCAs, VMEs, and a preliminary RMA. Except for the Laurentian Channel MPA, there are no associated prohibitions of marine activities such as those being proposed as part of this Project, and with the Project having little or no potential to result in adverse environmental effects upon these areas (see Section 5.9.2 of the original EA Report). The planned 2019 Project activities within EL 1135 do not intersect with any of the updated or amended protected and sensitive areas outlined above.

As described in the EA Report (Section 5.9.2), the VMEs and FCAs that intersect with the Study Area have been designated as such to identity ecologically important and sensitive areas, and/or to help protect benthic areas from further disturbance from certain types of (bottom contact) fishing activity. Many of the offshore survey activities that will be undertaken as part of this Project - including those planned for 2019 - will not result in any direct contact with the seabed and will therefore not physically disturb benthic animals or their habitats. It should be emphasized that the planned coldwater coral surveys that are being implemented in 2019 are intended to help further mitigate possible effects on these species resulting from any future exploration drilling activity that may be undertaken within these ELs by ExxonMobil.

As described for the various preceding biophysical VECs, the Project is not expected to result in any significant adverse effects upon marine fish, birds, mammals, sea turtles or their habitats. It will therefore not adversely affect the ecological features, processes and integrity of any marine or coastal areas, including the protected and sensitive areas that are part of this VEC. Implementation of the various environmental protection measures and procedures outlined throughout the EA Report, including those designed to avoid or reduce Project-related discharges and/or disturbances and their associated environmental effects, will also serve to help address any direct or indirect potential effects on intersecting or adjacent protected and sensitive areas. Mitigation measures and commitments outlined in the EA Report and Amendment remain applicable and will continue to be implemented and adhered to by ExxonMobil in planning and implementing this Project, including the planned 2019 survey activity.

The nature and scale of the planned 2019 activities and the updated baseline information provided above therefore do not change the results of the original (2015) environmental effects assessment or the 2018 Amendment for this VEC, and the Project is still not likely to result in significant adverse environmental effects on protected or sensitive areas.

## 3.6 Marine Fisheries and Other Activities

### 3.6.1 Commercial Fisheries

Fisheries were a key area of focus of the EA review for the Project, and on-going Project planning and implementation will continue to place a high degree of emphasis on addressing the potential for interactions with commercial fishing activity within and near the Study Area.

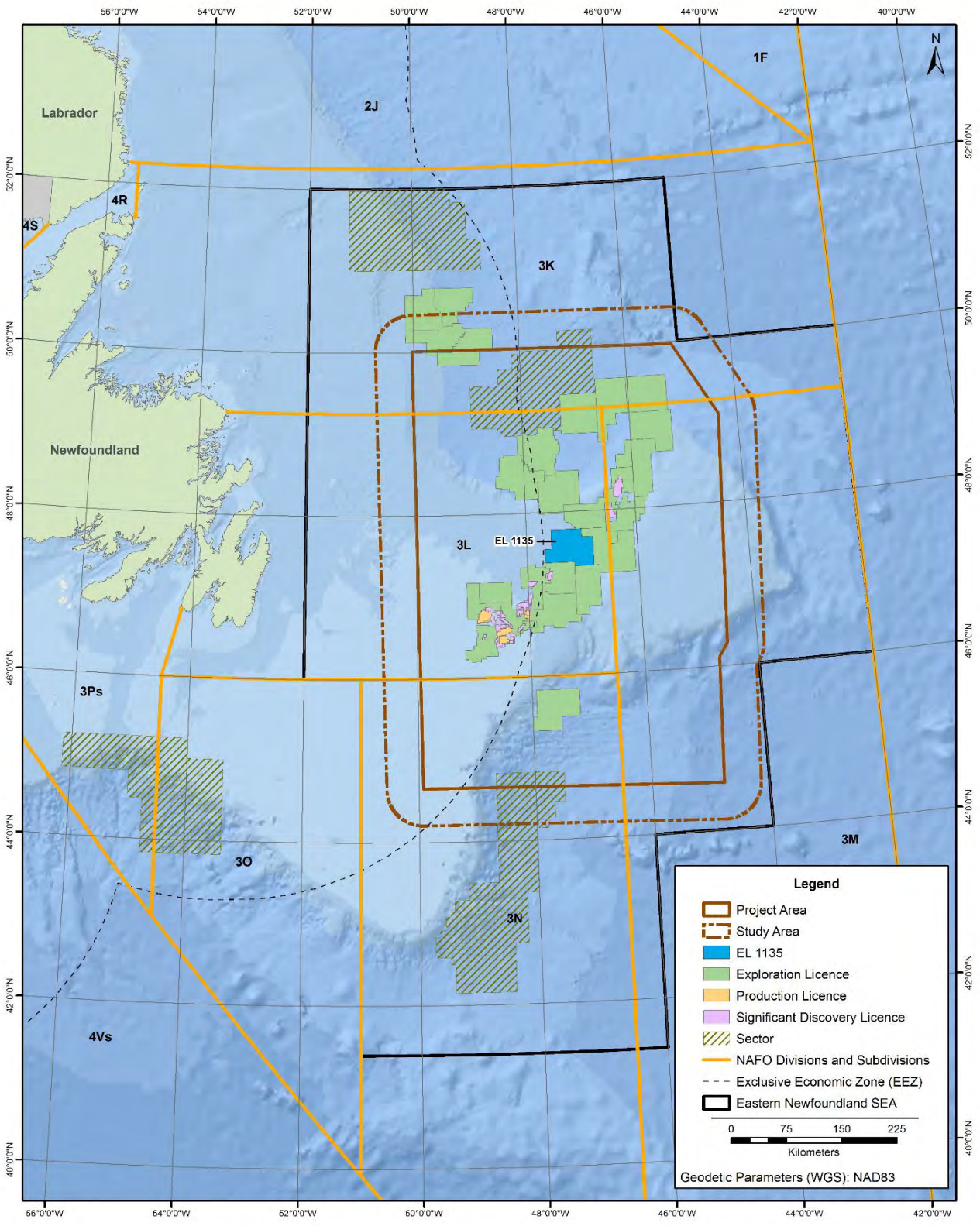
As described in the original EA Report (Section 4.3.1) and subsequent EA Update, several regulatory marine fisheries jurisdictions overlap with the Study Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within the 200 nautical mile exclusive economic zone (EEZ) and for benthic invertebrates across the continental shelf. Beyond the EEZ, the North Atlantic Fisheries Organization (NAFO) manages groundfish and other resources and activities.

For administrative purposes, the Northwest Atlantic is divided into a series of NAFO Divisions, Subdivisions and Unit Areas (Figures 3.3 and 3.4), and although fish harvesting activities and fisheries management responsibilities do extend across these areas and their boundaries, they are generally

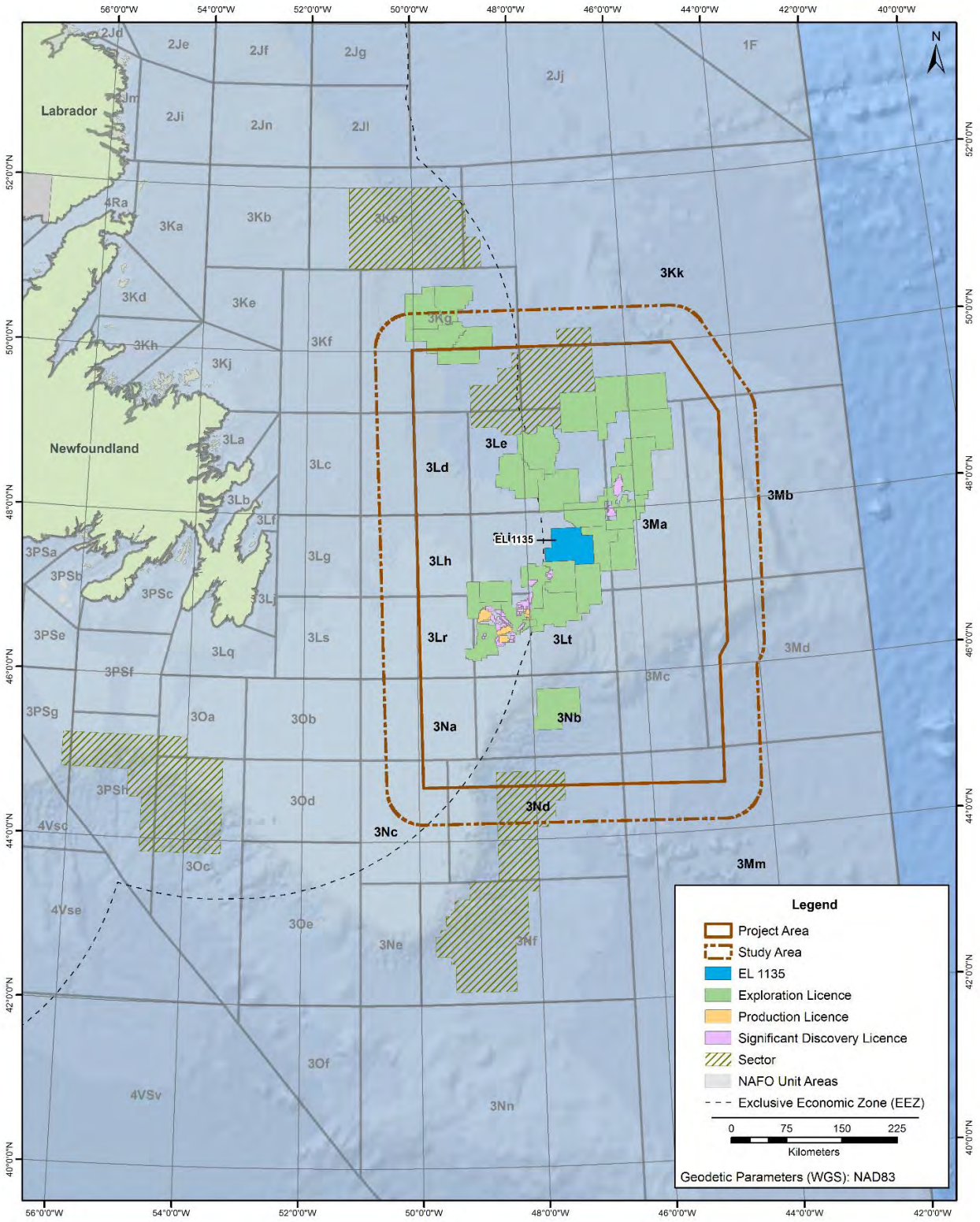
used to regulate and manage fishing activity. EL 1135 overlaps with a portion of NAFO Division 3L, and specifically with NAFO Unit Area 3Li.

Commercial fisheries data are provided by Fisheries and Oceans Canada (DFO) Statistical Services in Ottawa, ON, including mapping information on the location of recorded 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. Only updated data since the 2018 EA Update are provided in this Section. In addition to the updated datasets, effects assessment on commercial fisheries considers data provided in the original EA Report and subsequent EA Update.

## Figure 3.3 NAFO Divisions and Subdivisions



## Figure 3.4 NAFO Unit Areas Within and Adjacent to Study Area



The sections and associated tables, graphs and figures that follow, provide an overview of commercial fisheries in the NAFO Unit Areas that overlap with EL 1135, are based on the following data:

- DFO (2017) available 2016 fisheries data (landings statistics), which provide a summary of commercial fisheries in NAFO Unit Area 3Li;
- NAFO (2017) Data Extraction Tool (Statlant 21A) available 2016 data, which provide an updated summary of commercial fish landings in NAFO Division 3L that overlap EL 1135; and
- DFO (2018) 2016 fisheries geospatial data, which are used to map commercial fisheries in waters within and near EL 1135.

**Domestic Commercial Fish Harvests: Overall Landings (Weight and Value)**

The available DFO data indicate that the 2016 commercial fish (finfish and shellfish) harvest within EL 1135 (namely in Unit Area 3Li as referenced above) totalled approximately 3,400 tonnes, with a landed value of over 22 million (Table 3.7). This reflects a change from previous landings data, which is partly the result of increasingly redacted harvest data, but also reflects closure of the shrimp fishery in the area as described further below.

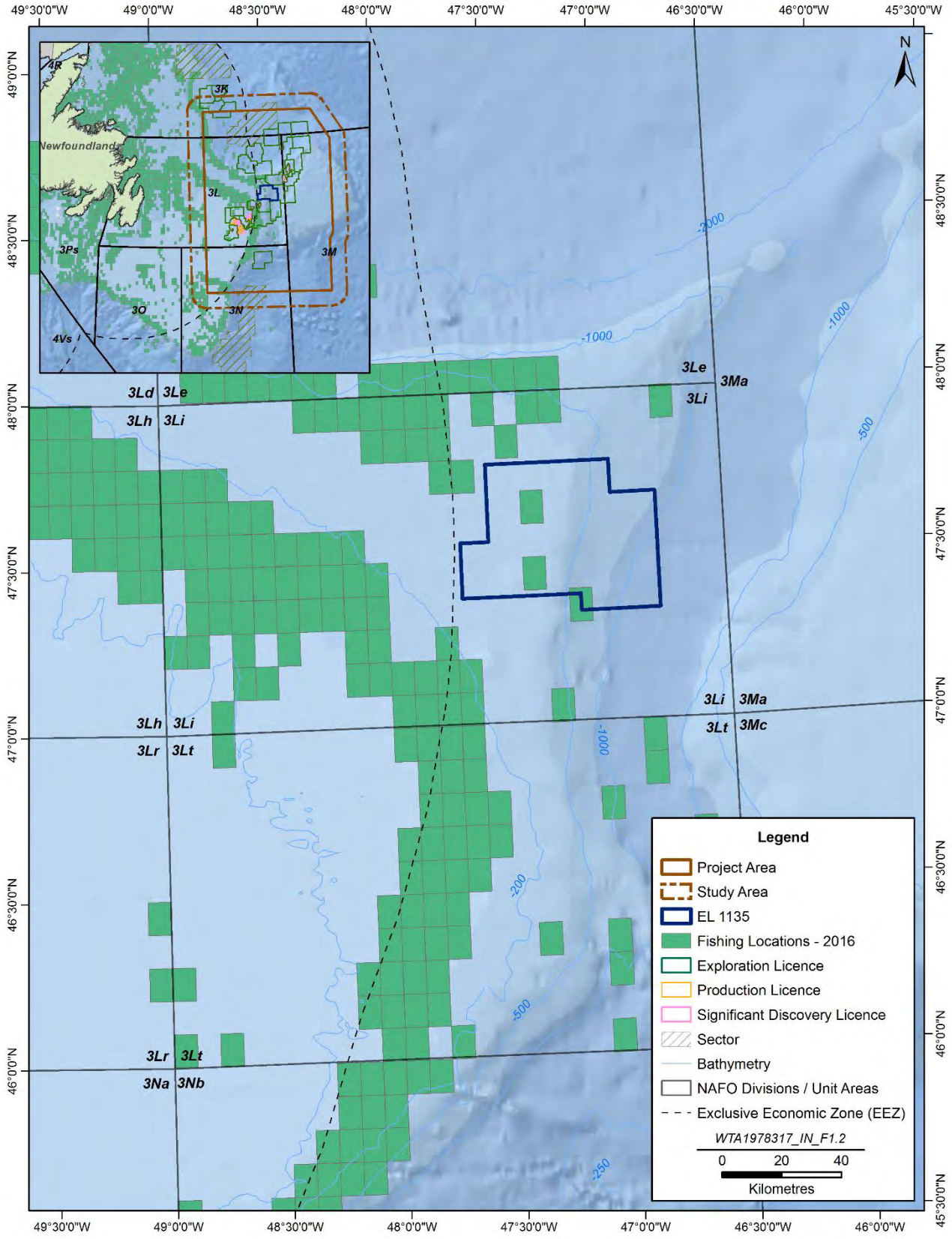
**Table 3.7 Fish Harvests by Weight and Value (2016, NAFO Unit Area 3Li)**

| Year | Weight (kg) | Value ($) |
|---|---|---|
| 2016 | 3,390,764 | 22,199,269 |
| **Total** | **3,390,764** | **22,199,269** |

**Domestic Commercial Fish Harvests: Overall Geographic Distribution**

Figure 3.5 provides a general illustration of the geographic distribution of 2016 (May to November) commercial fishing activity within and adjacent to the EL 1135. As indicated previously, the information provided in the maps that follow is based on the partially redacted geospatial data received from DFO and shows the general presence of recorded fishing activity for a series of 6 x 4 nautical mile “cells” that together comprise a map grid that covers the region. Further information on commercial fishing activity by species, season, gear type and other parameters is provided in the sections that follow.

## Figure 3.5 Commercial Fishing and Locations, All Species: 2016 (May to November)



### Domestic Commercial Fish Harvests: By Species

In recent years, the fishery has been strongly dominated by queen / snow crab in terms of both landed weight and value (Table 3.8). This is well reflected in the DFO fish landings statistics for 2016, as summarized below.

**Table 3.8 Fish Harvests by Species by Weight and Value (2016, NAFO Unit Area 3Li)**

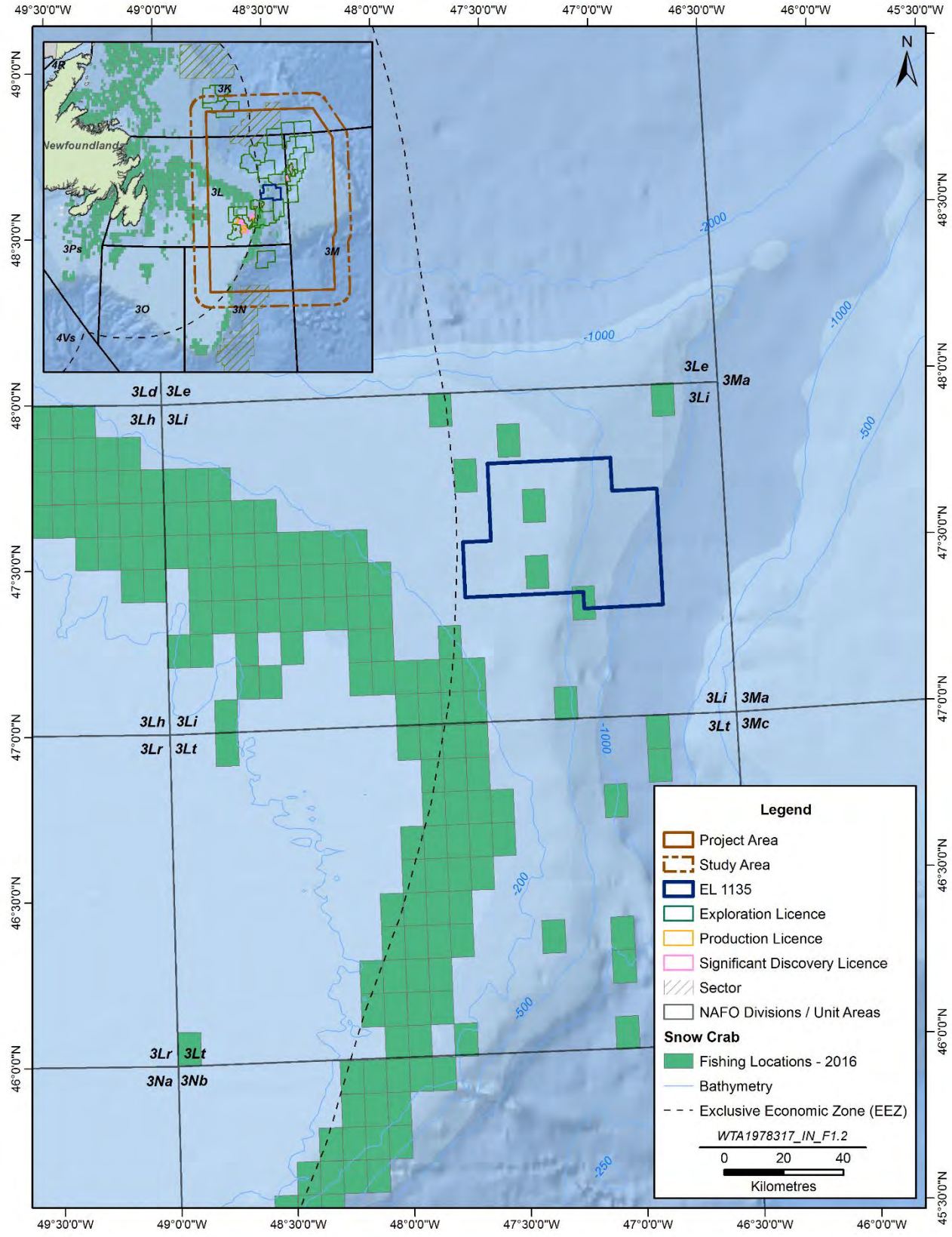
| Species by Year (2016) | Weight (kg) | Value ($) |
|---|---|---|
| **2016** | 3,390,764 | 22,199,269 |
| Crab, Queen/Snow | 3,390,764 | 22,199,269 |
| American Plaice | - | - |
| Cod, Atlantic | - | - |
| Grenadier, Rough-Head | - | - |
| Greysole/Witch | - | - |
| Halibut – Atlantic | - | - |
| Redfish | - | - |
| Turbot/Greenland Halibut | - | - |
| **Total** | 3,390,764 | 22,199,269 |

The weight and landings values are based on available DFO data, which were only provided for snow crab in Unit Area 3Li. Landings weight and value for all other species (e.g., witch flounder, Atlantic halibut, Atlantic cod) captured in NAFO division 3Li, including those displayed in Figures 3.6 to 3.10 were not available for 2016.

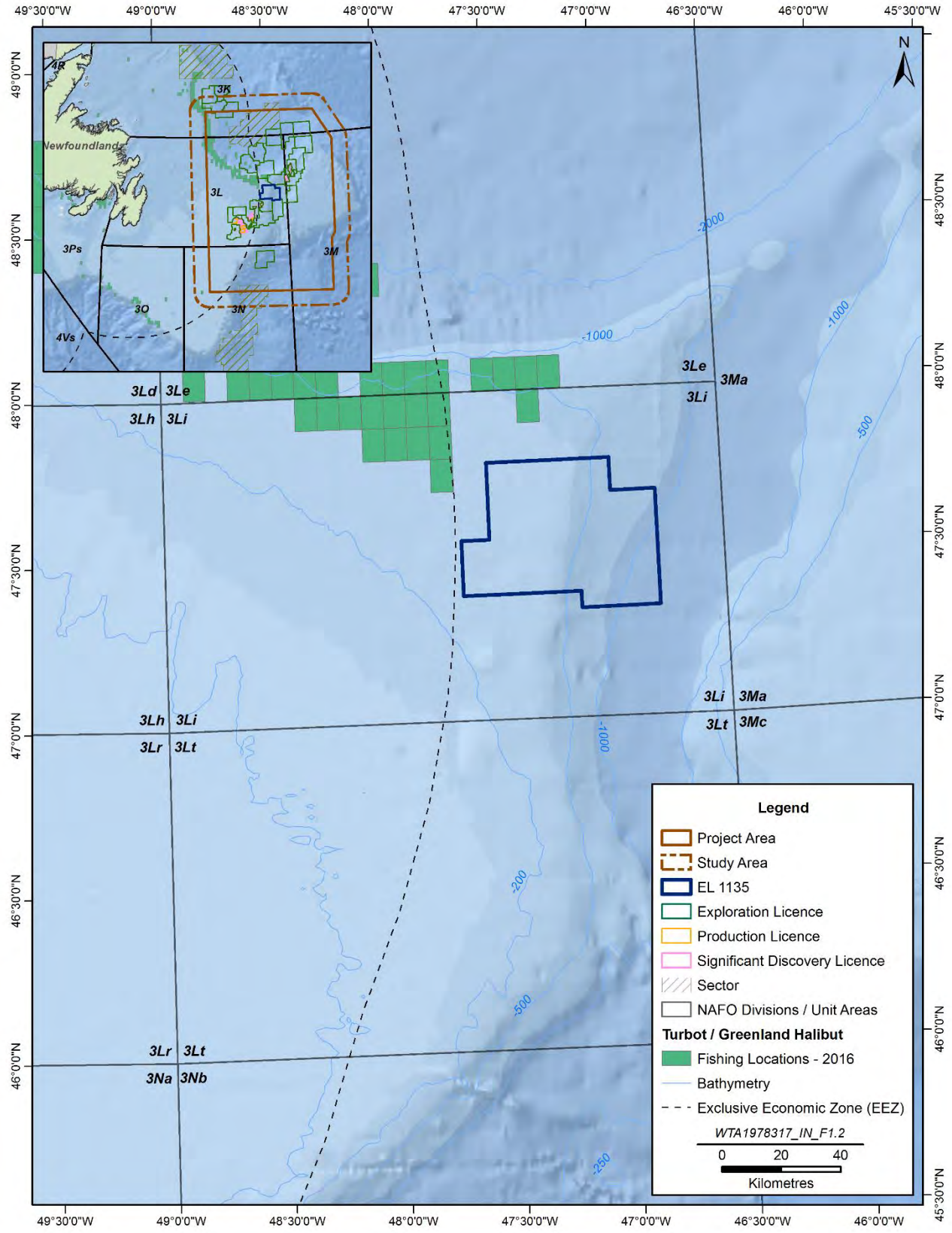
Until 2013 - 2014, the Northern shrimp fishery had been one of the most important commercial harvests in the Study Area, as it continues to be in more northern fishing areas. However, recent quota reductions and closures have significantly reduced commercial shrimp fishing off Eastern Newfoundland (Parrill 2016), including within the Study Area.

Figures 3.6 to 3.10 show the overall geographic distribution of recorded commercial fishing activity for key species in 2016, based on the DFO geospatial databases described above. This includes those species that comprised the highest proportion of the area's fishery during that period, as well as other species with recorded fishing activity in the area and/or which were mapped in the original EA Report.

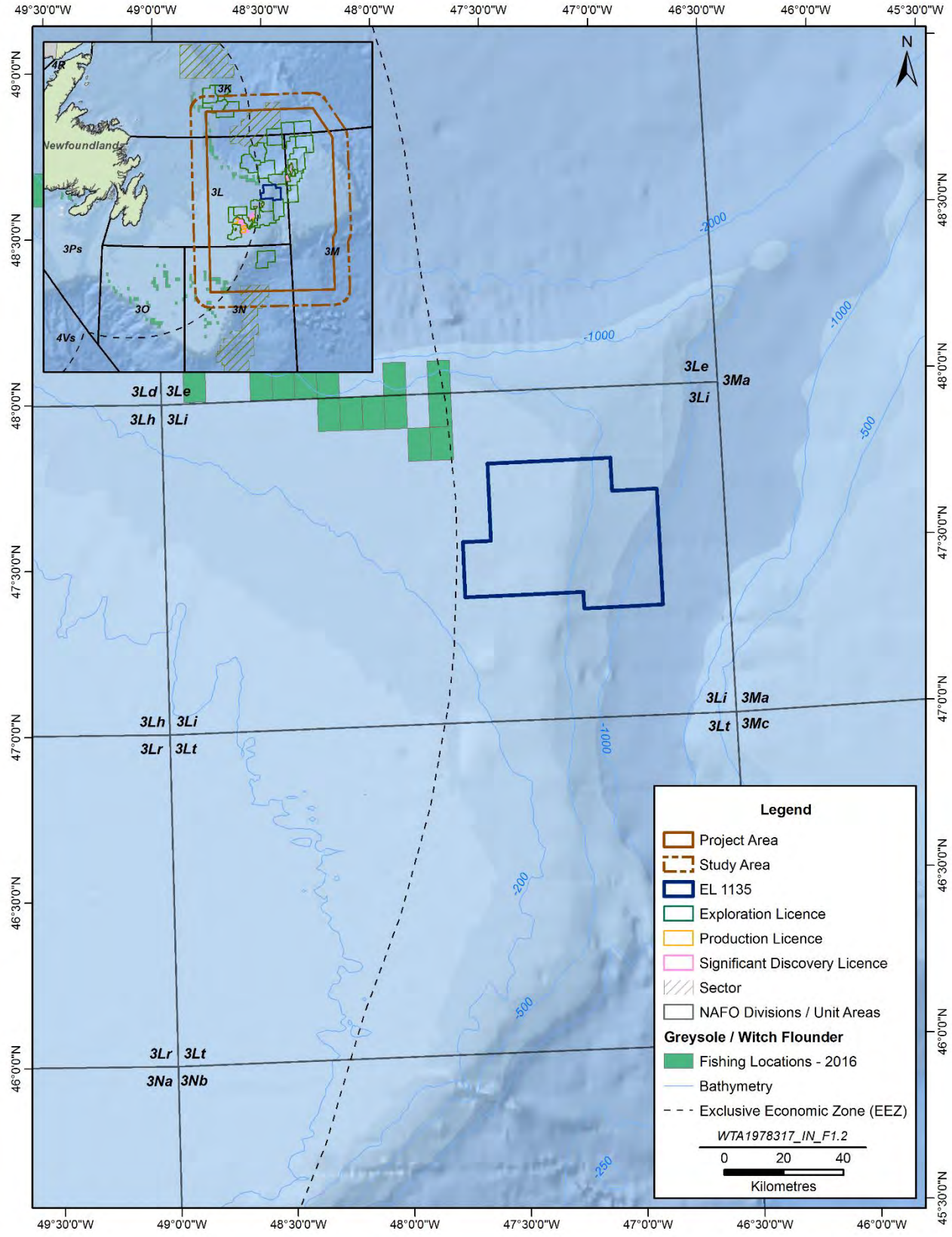
## Figure 3.6 Fishing Locations – Queen / Snow Crab (May – November 2016)



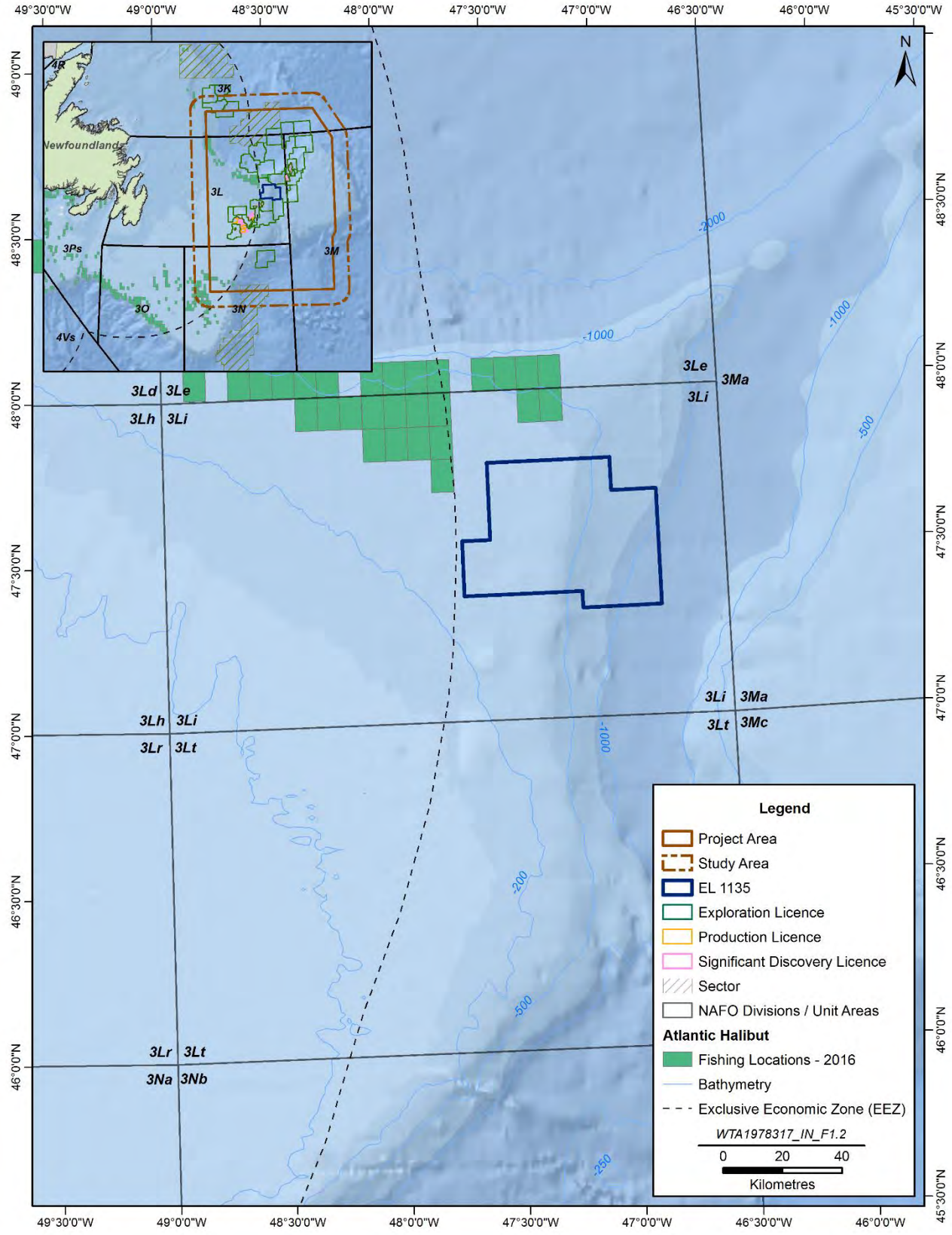
## Figure 3.7 Fishing Locations – Turbot / Greenland Halibut (May – November 2016)



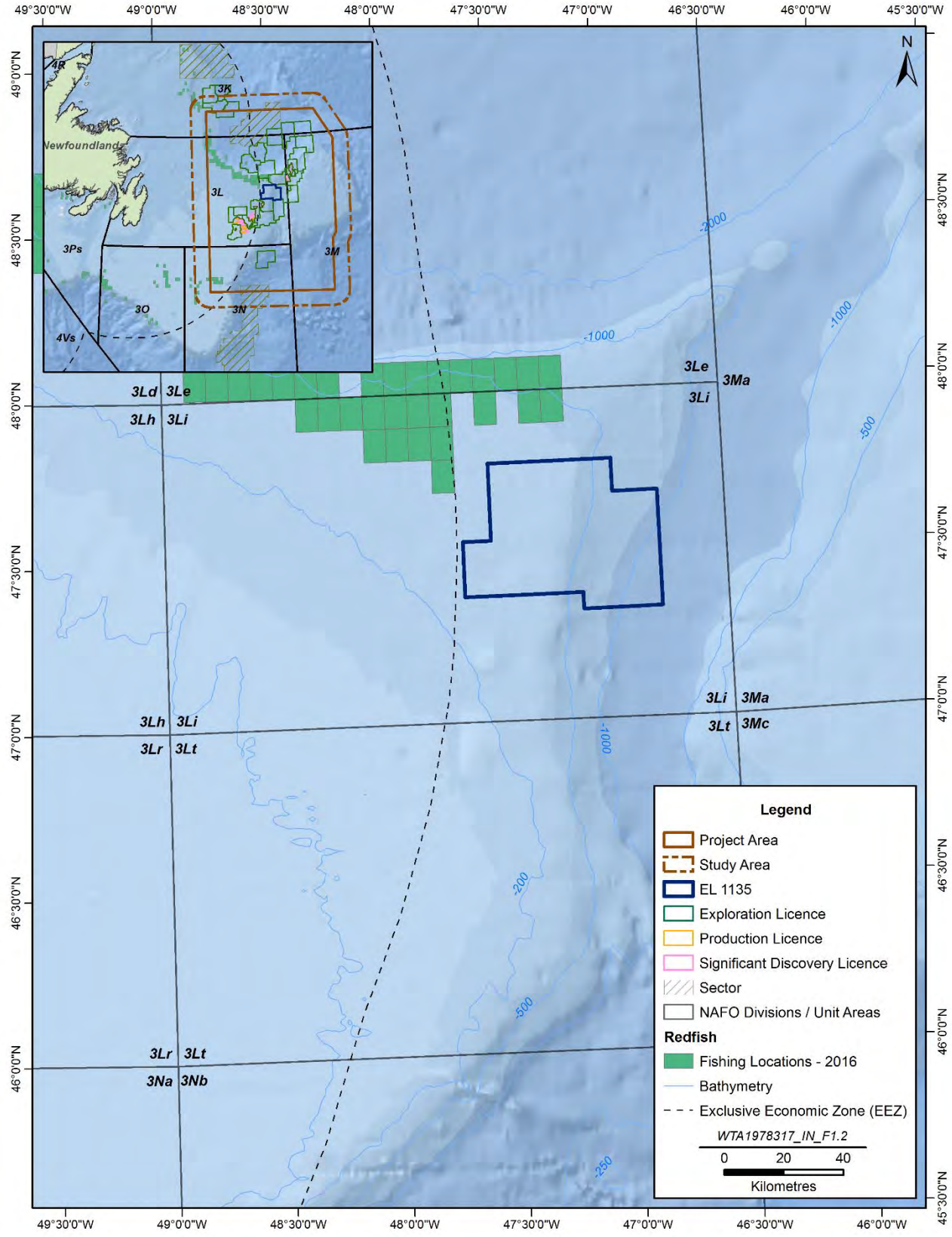
## Figure 3.8 Fishing Locations – Greysole / Witch Flounder (May – November 2016)



## Figure 3.9 Fishing Locations – Atlantic Halibut (May – November 2016)



## Figure 3.10 Fishing Locations – Redfish (May – November 2016)



### Commercial Fish Harvest – Seasonality

During the 2016 period, fishing activity within the Study Area occurred generally from April to September. The highest landings by both weight and value occurring in the May to July period (Table 3.9**Error! Reference source not found.**, Figures 3.11 and 3.12).

**Table 3.9 Fish Harvests by Month by Weight and Value (2016, NAFO Unit Area 3Li)**

| Month | 2016 | Month | 2016 |
|---|---|---|---|
| **Weight (kg)** | | **Value ($)** | |
| January | - | January | - |
| February | - | February | - |
| March | - | March | - |
| April | 652,992.00 | April | 4,263,917.80 |
| May | 1,579,823.00 | May | 10,316,087.90 |
| June | 928,458.00 | June | 6,101,441.72 |
| July | 229,491.00 | July | 1,517,821.98 |
| August | - | August | - |
| September | - | September | - |
| October | - | October | - |
| November | - | November | - |
| December | - | December | - |
| **Total** | **3,390,764.00** | **Total** | **22,199,269.40** |

**Figure 3.11 Total Monthly Fish Harvests, All Species by Weight (2016, NAFO Unit Area 3Li)**

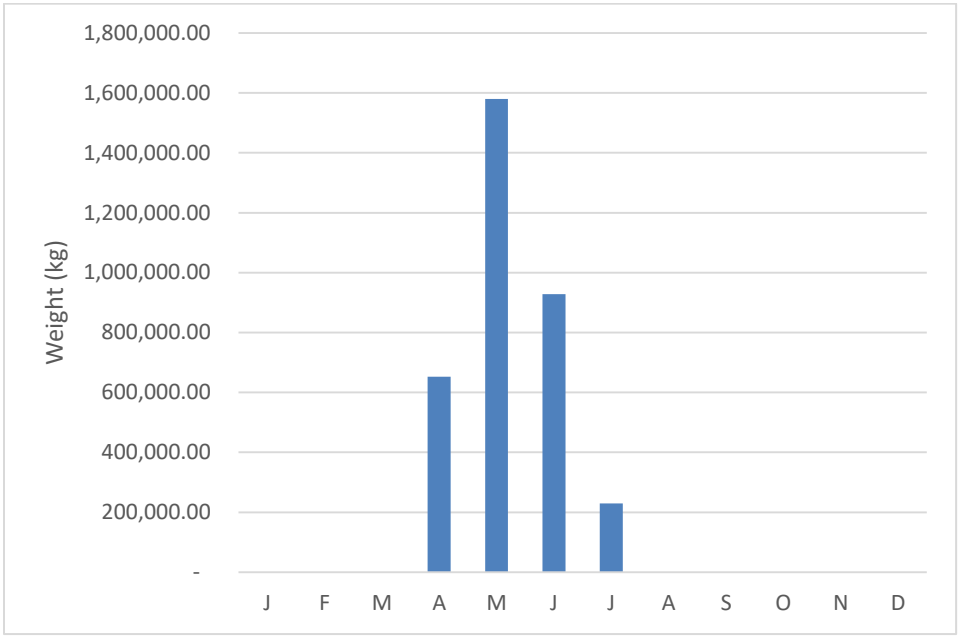
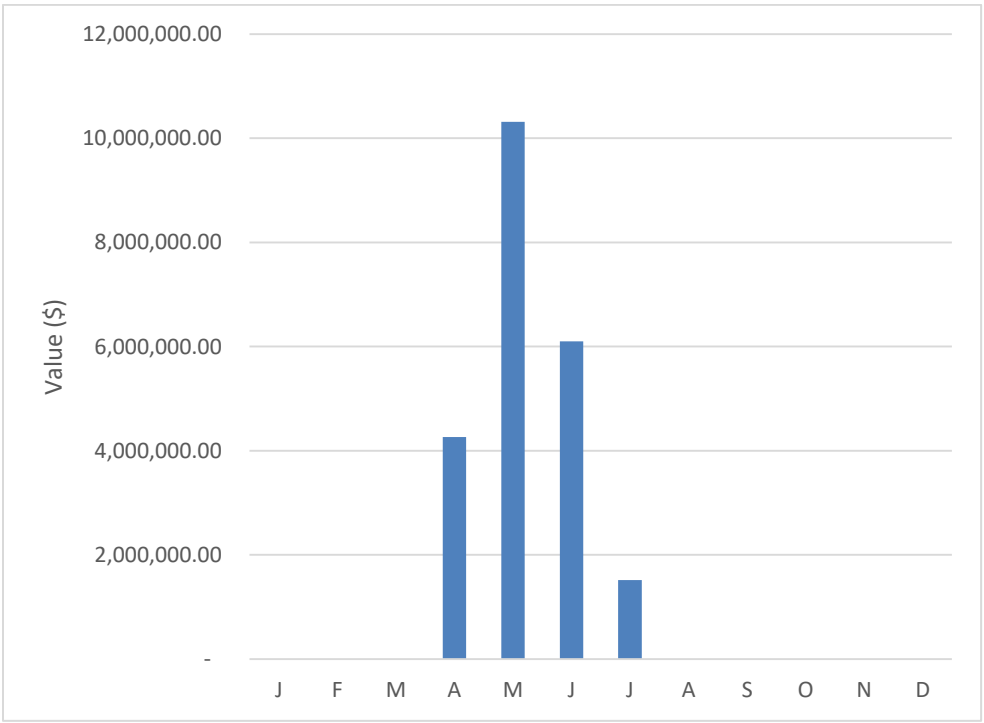
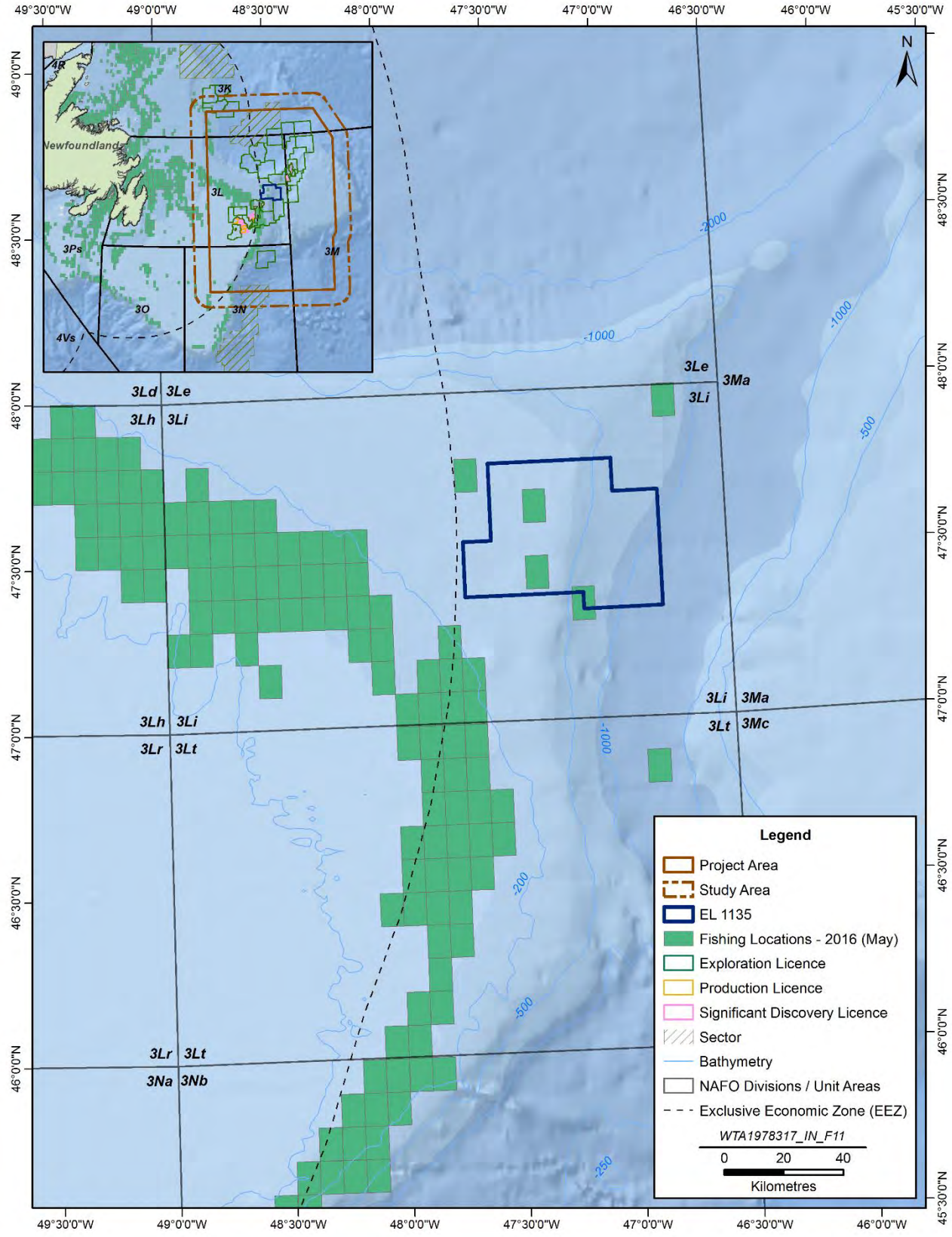



**Figure 3.12 Total Monthly Fish Harvests, All Species, by Value (2016, NAFO Unit Area 3Li)**

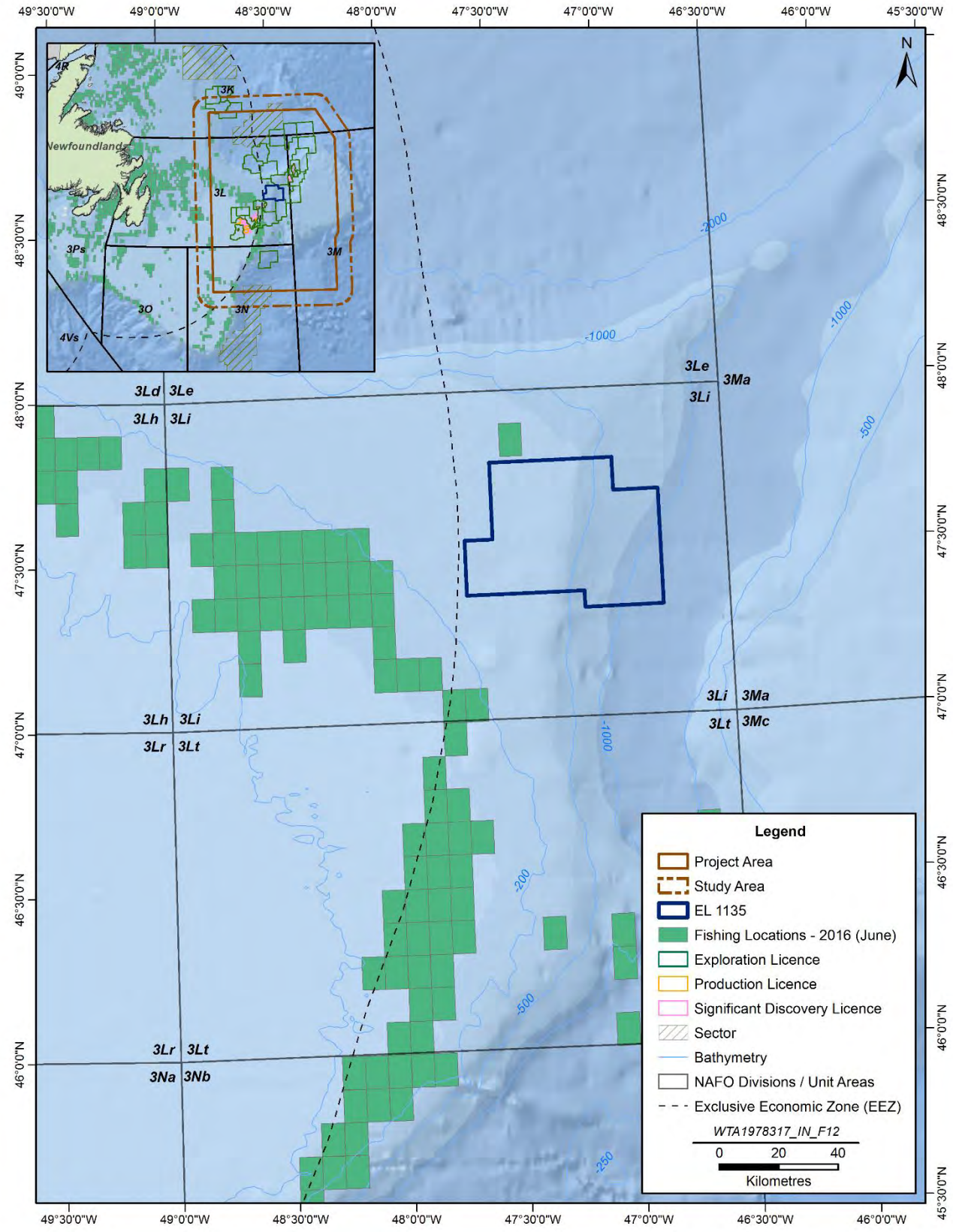



Figures 3.13 to 3.19 show the overall 2016 geographic distribution of recorded commercial fishing activity for all species by month from May to November. The figures are based on the geospatial database provided DFO.

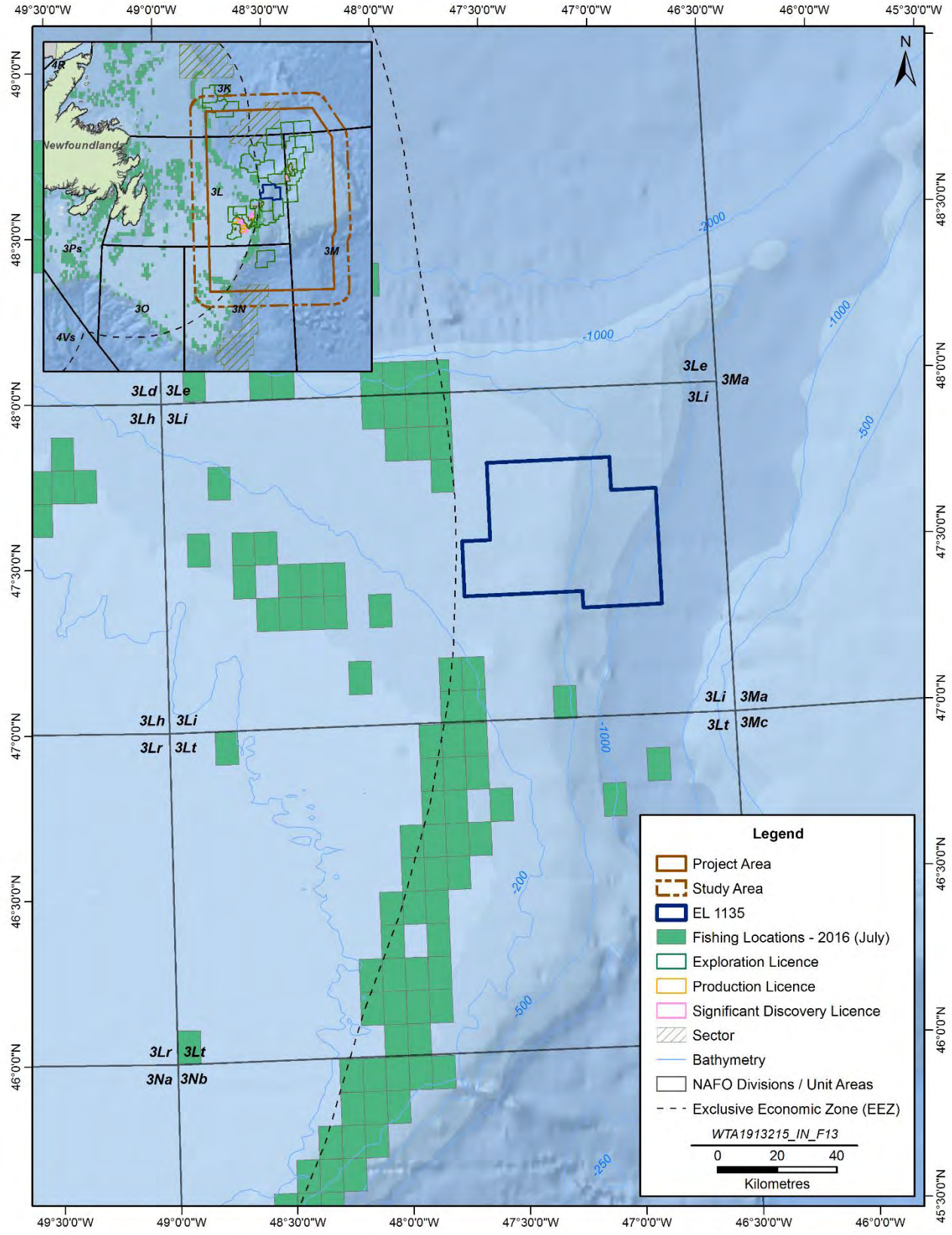
## Figure 3.13 Commercial Fishing Locations, All Species (May 2016)



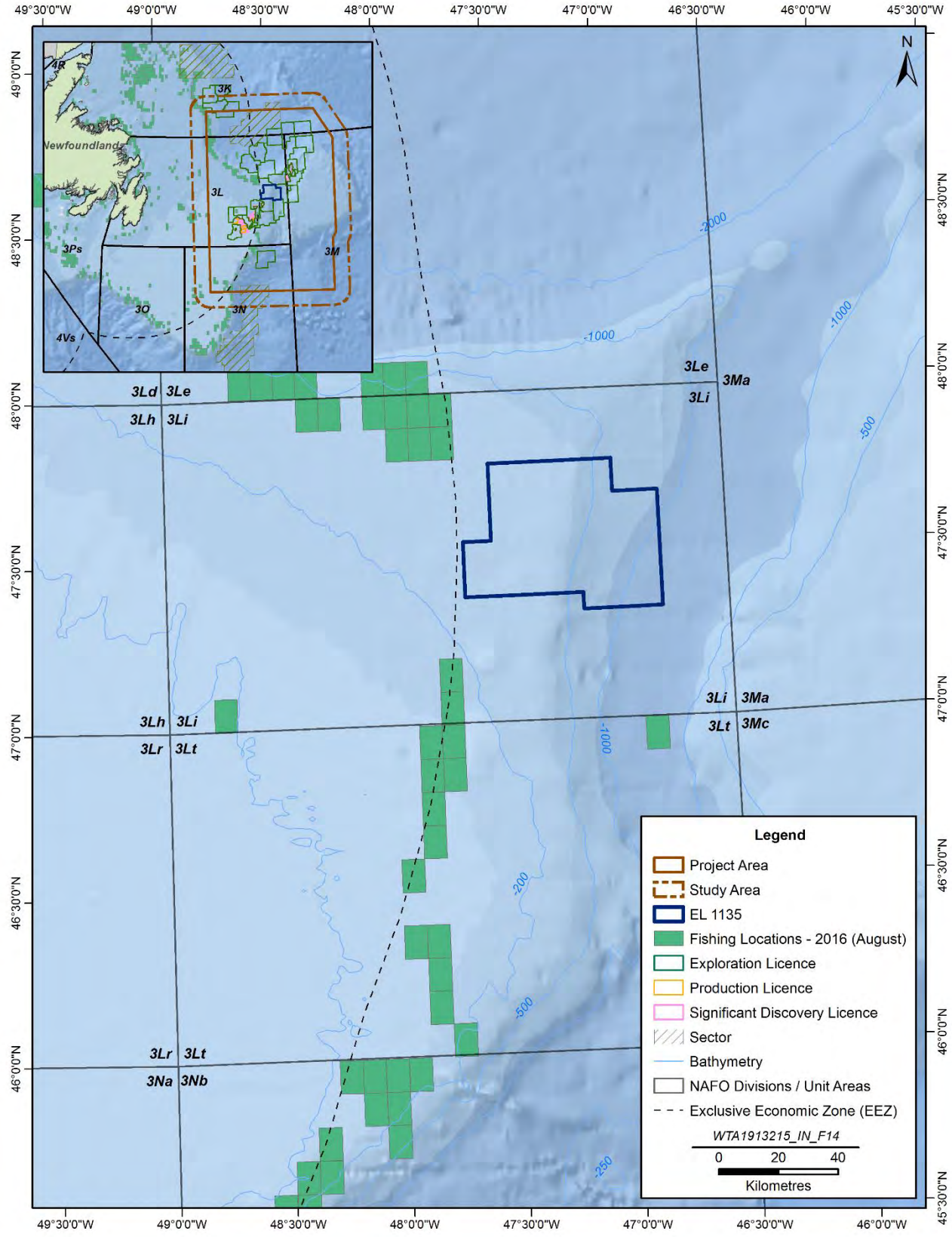
## Figure 3.14 Commercial Fishing Locations, All Species (June 2016)



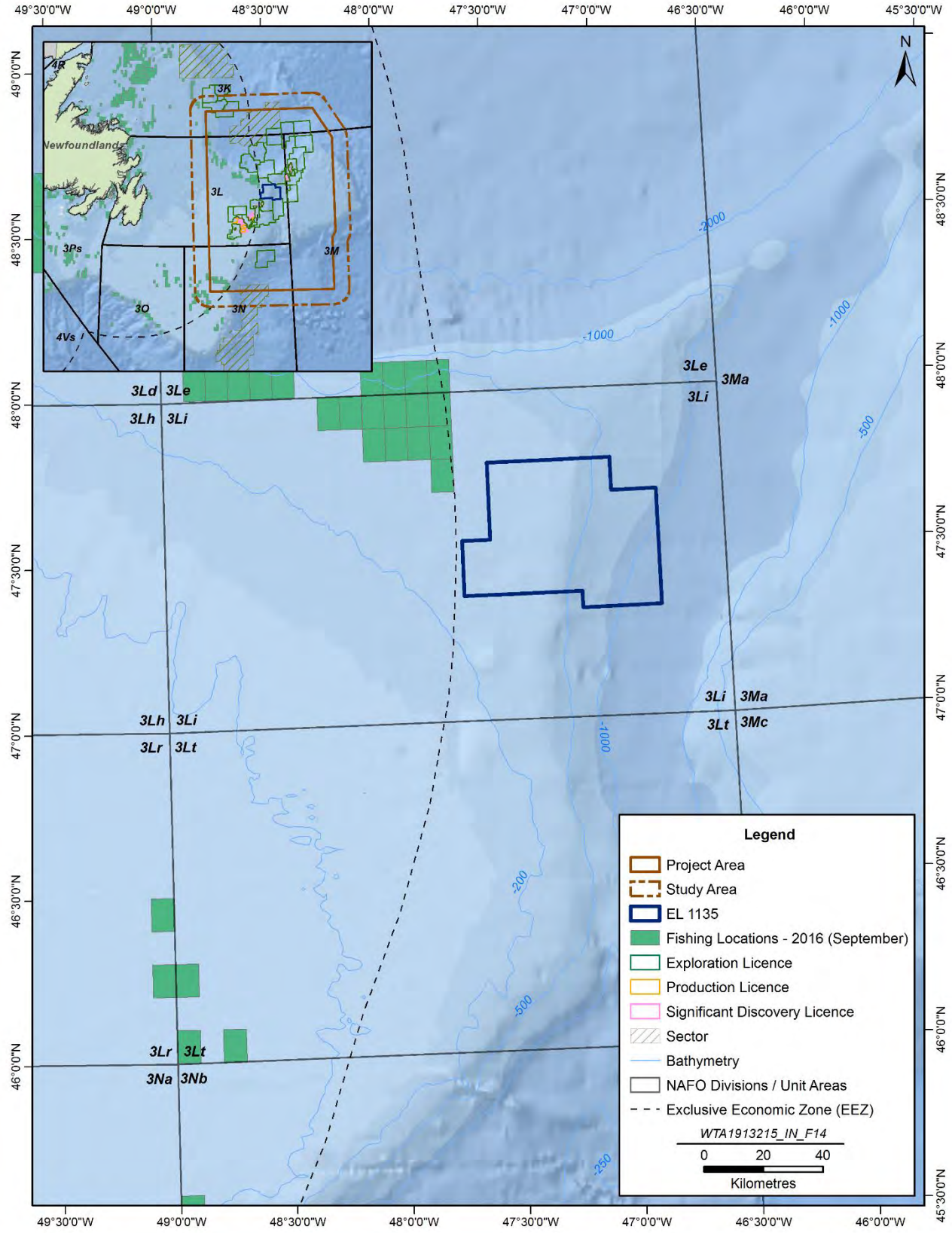
## Figure 3.15 Commercial Fishing Locations, All Species (July 2016)



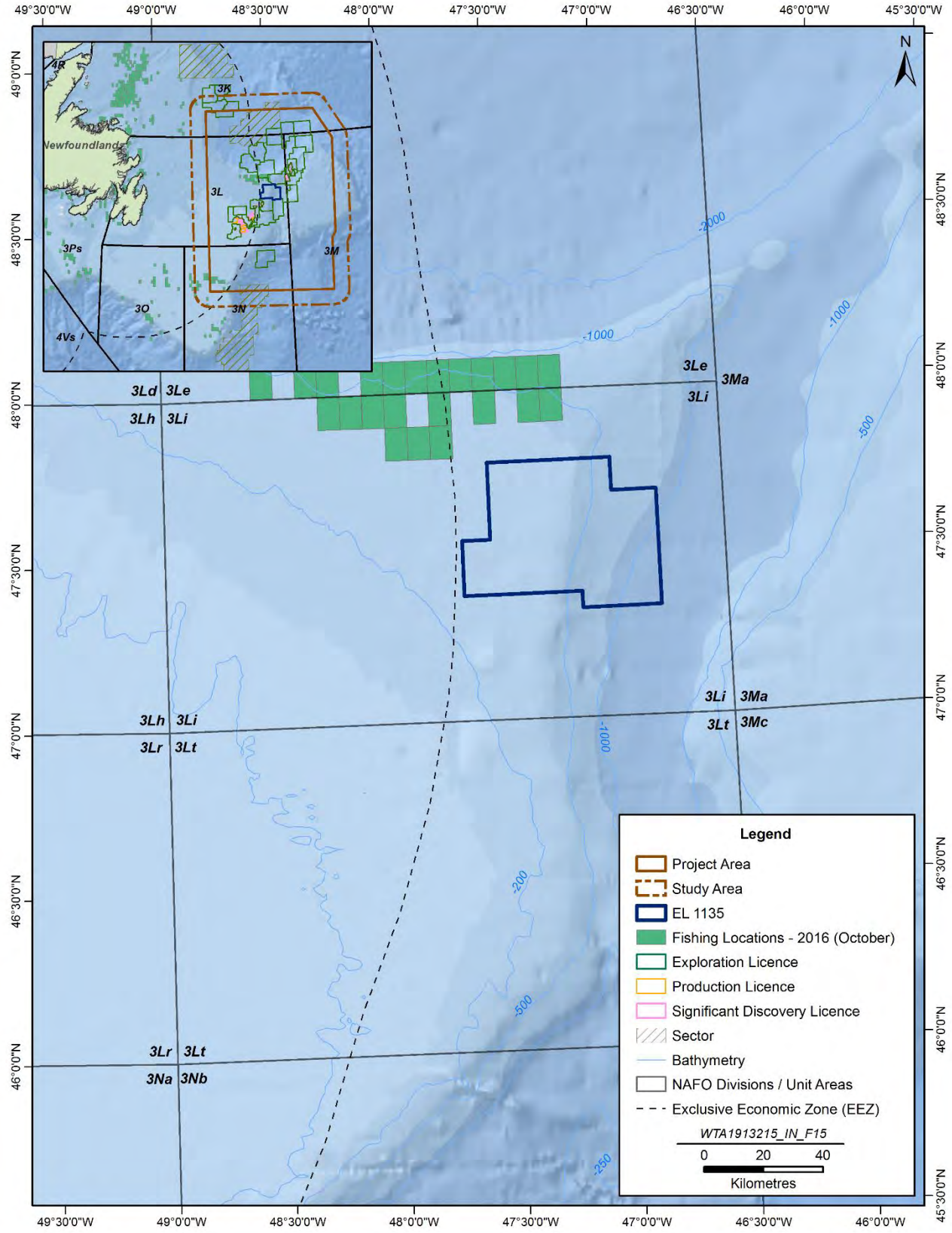
## Figure 3.16 Commercial Fishing Locations, All Species (August 2016)



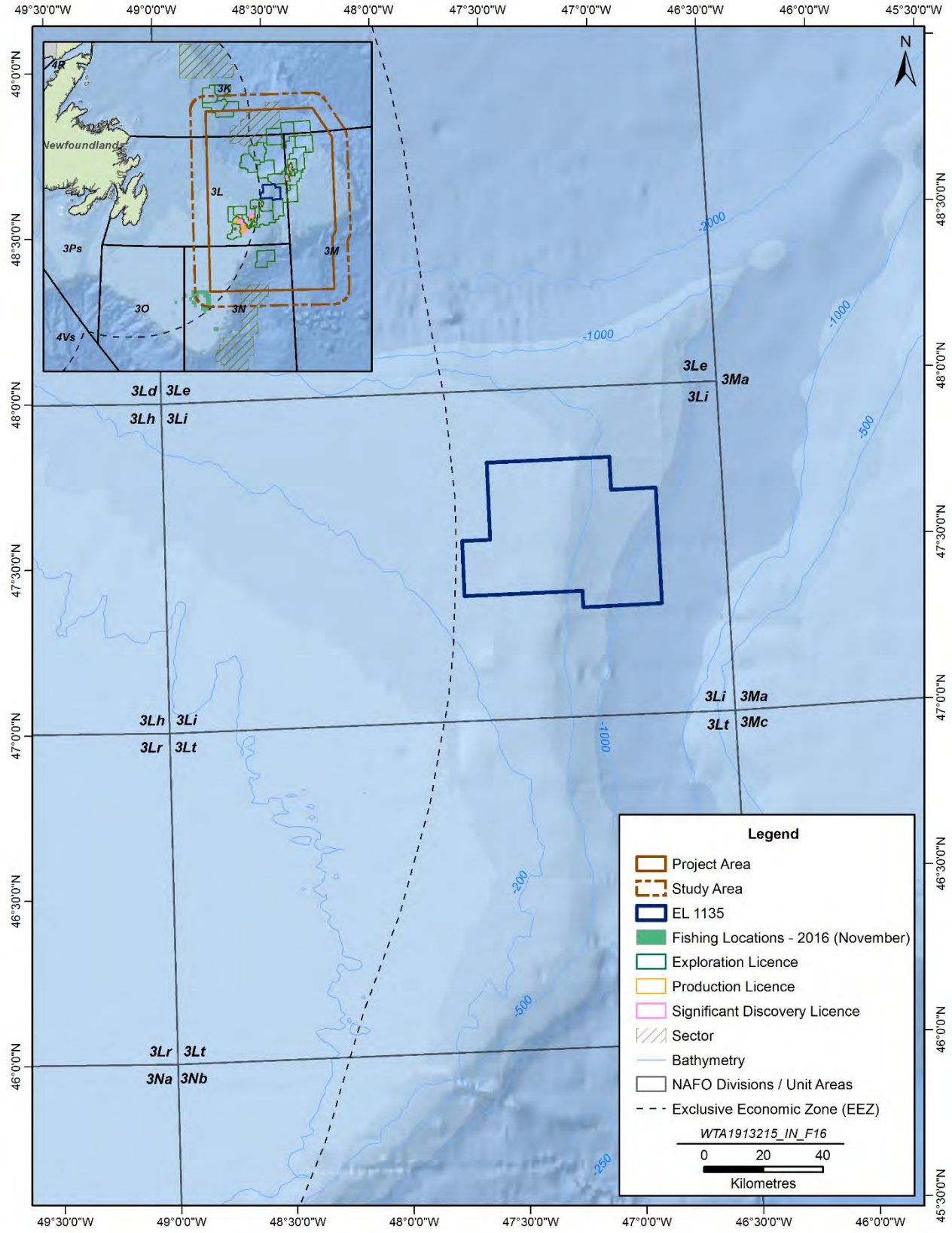
## Figure 3.17 Commercial Fishing Locations, All Species (September 2016)



## Figure 3.18 Commercial Fishing Locations, All Species (October 2016)



## Figure 3.19 Commercial Fishing Locations, All Species (November 2016)



### Commerical Fish Harvests – Gear Types

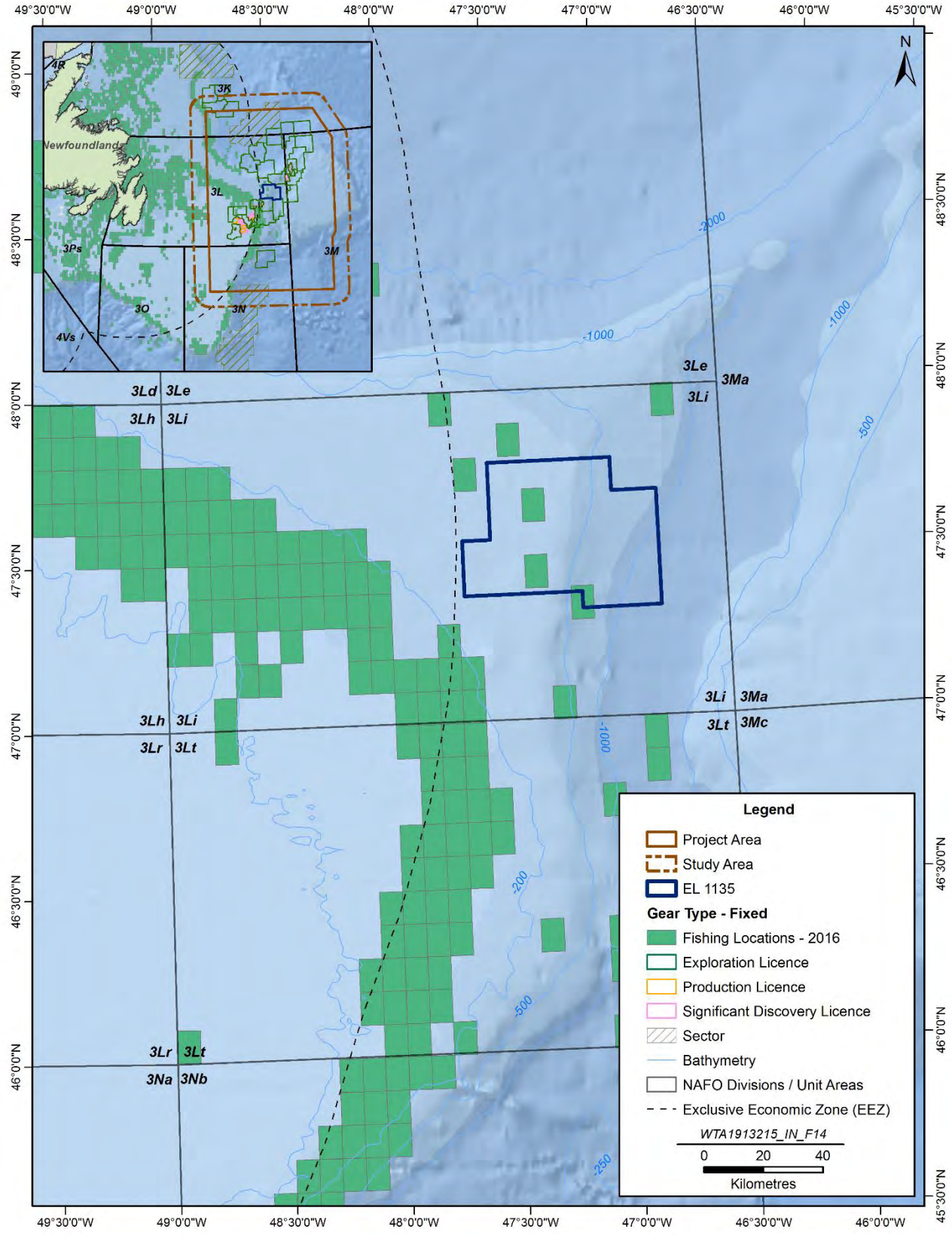
The available DFO datasets also reflect that both Pot (Unspecified) and Bottom Otter Trawl (Stern) fishing gear types were used as part of the commercial fishery within and around EL 1135 in 2016 (Table 3.10). However, weight and value data was only provided for Pot (Unspecified) gear as shown in the table below.

**Table 3.10 Fish Harvests by Gear Type by Weight and Value (2016, NAFO Unit Area 3Li)**

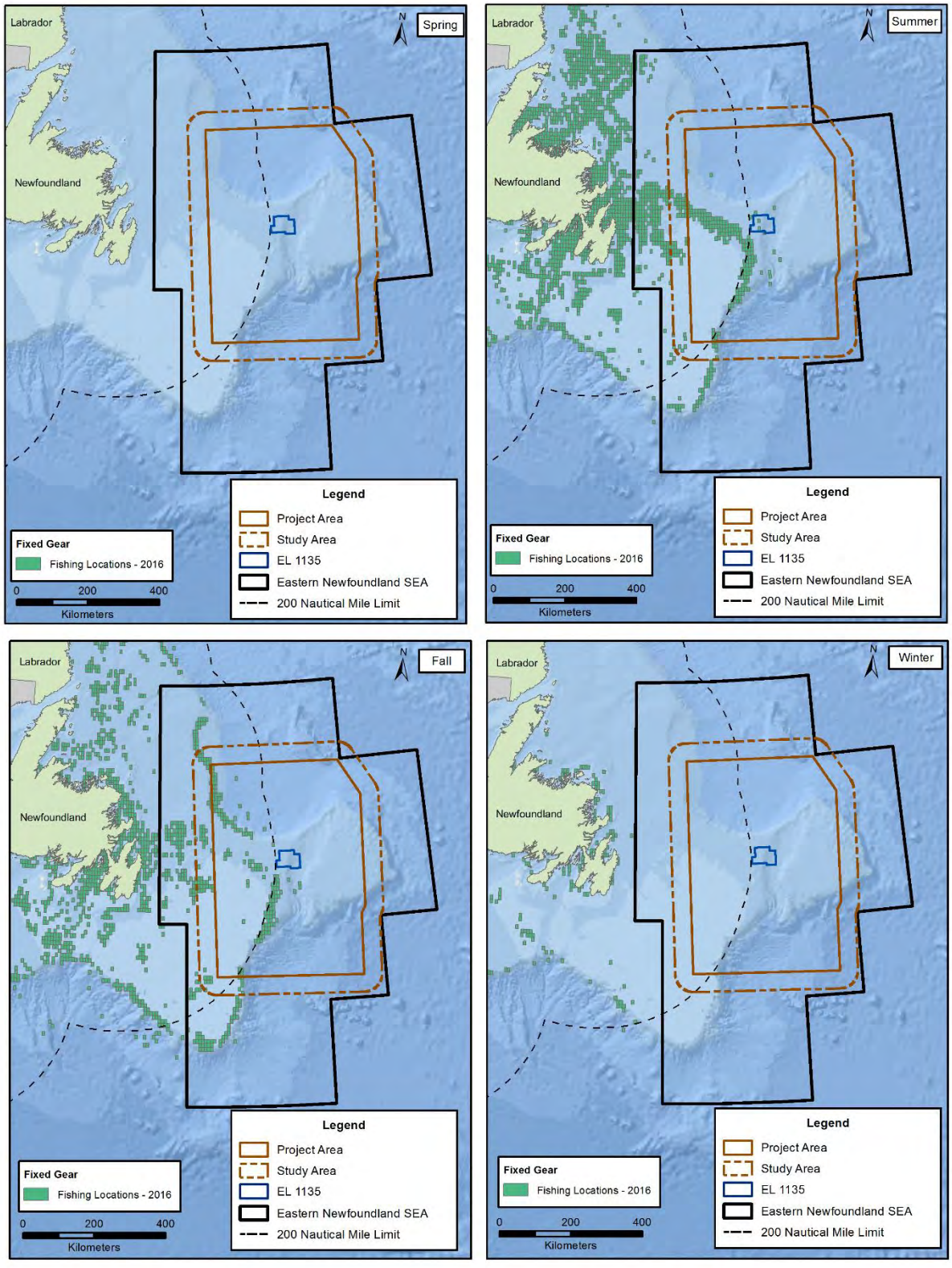
| **Weight by Gear Type** | **2016** | **Total** |
|---|---|---|
| Pot (Unspecified) | 3,390,764 | 3,390,764 |
| Bottom Otter Trawl (Stern) | - | - |
| **Total** | **3,390,764** | **3,390,764** |
| | | |
| **Value by Gear Type** | **2016** | **2016** |
| Pot (Unspecified) | 22,199,269 | 22,199,269 |
| Bottom Otter Trawl (Stern) | - | - |
| **Total** | **22,199,269** | **22,199,269** |

Figures 3.20 to 3.23 show the overall geographical distribution of recorded activity by gear type, within and in close proximity to EL 1135 and NAFO Unit Area 3Li. Distribution is shown by gear type (i.e., fixed and mobile) and also by season. As stated previously, available DFO data were limited to weight and landings.

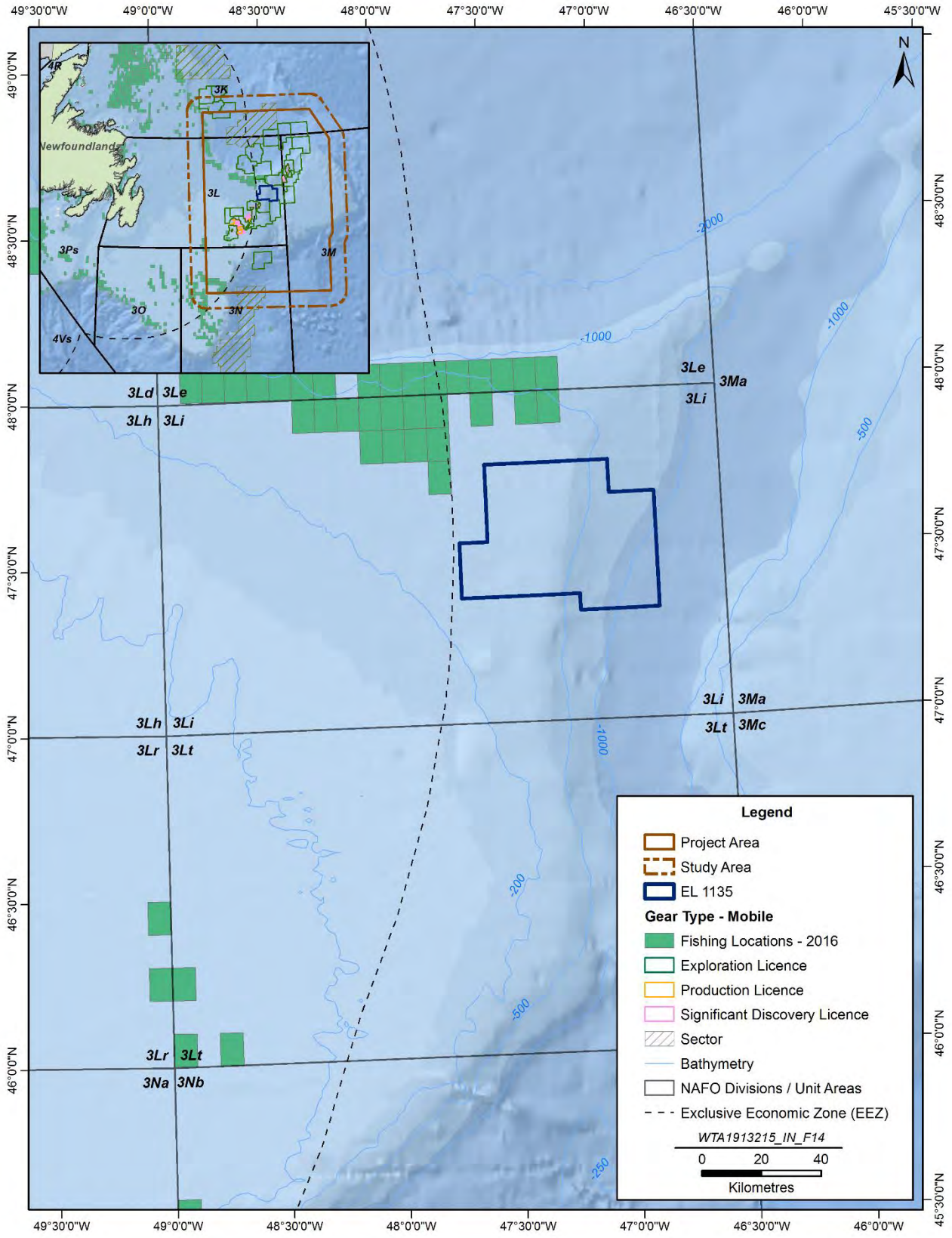
## Figure 3.20 Fish Harvests Using Fixed Gear Types (May – November 2016)



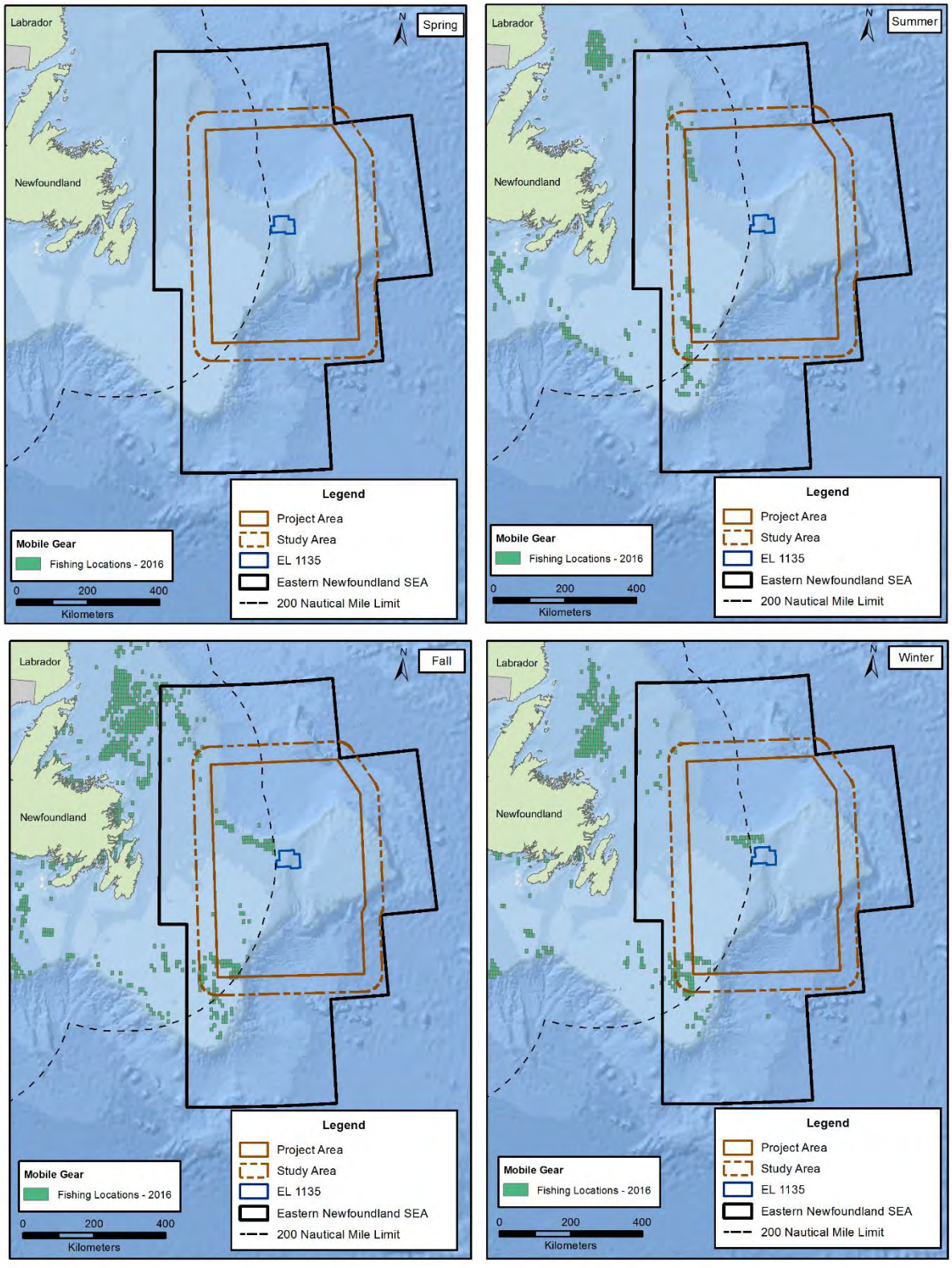
## Figure 3.21 Fish Harvests Using Fixed Gear Types (By Season – May – November 2016)



## Figure 3.22 Fish Harvests Using Mobile Gear Types (May – November 2016)



## Figure 3.23 Fish Harvests Using Mobile Gear Types (By Season – May to November 2016)



### 3.6.2 Commercial Fishing Activity by Canadian and Foreign Fishers in NAFO Division 3L

As described at the beginning of this section, NAFO (Statlant 21A) 2016 fish landings data were used to provide an updated summary of commercial fish landings in the overall NAFO Division 3L. As noted previously, several regulatory jurisdictions pertain to marine fish and fisheries within this region. The Government of Canada has jurisdiction over fish stocks and fishing activities within the EEZ and for benthic invertebrates (such as crab) across the entire continental shelf, with NAFO managing groundfish activities and other resources beyond the EEZ. NAFO, which manages 19 commercial stocks consisting of 11 species, reported that vessels from 13 flag states fished in the Northwest Atlantic in 2012 (Amec 2014).

The preceding discussion has focussed on 2016 commercial fishing activity within NAFO Unit Area 3Li that overlap EL 1135. The datasets used to conduct these analyses were obtained through DFO and record only the domestic and foreign harvests landed in Canada. The following tables and figures provide updated summaries of Canadian and foreign fishing activity in NAFO Division 3L for 2016. The Division level is the highest resolution for which such data are available from the NAFO (Statlant 21A) dataset (Table 3.9). It should be noted that Canadian landings in this dataset are also captured in the DFO data, above.

The available data show that in 2016, Canadian and international fishing activity was relatively lower than previous years. However this analysis is based on limited available 2016 data (Table 3.9). As indicated, queen crab, which represented approximately 45 percent of the total landed catch in 2016, is the most commonly harvested species in this overall region (Table 3.10, Figure 3.24, with other key species including capelin (inshore / nearshore), Atlantic Redfishes (ns) and others. Various countries conducted fishing activity in the area during that period (Table 3.11, Figure 3.25).

**Table 3.11 Canadian and International Fishing Activity NAFO Division 3L (tonnes) (2016)**

| NAFO Division | 2016 | Total |
|---|---|---|
| 3L | 51,140 | 51,140 |

**Table 3.12 Canadian and International Fishing Activity by Species in NAFO Division 3L (2016)**

| Species | Total Catch (tonnes) |
|---|---|
| Queen Crab | 22,893 |
| Capelin | 16,187 |
| Atlantic Redfishes (ns) | 6,652 |
| Greenland Halibut | 3,903 |
| Atlantic Cod | 603 |
| Other | 902 |
| Total | 51,140 |
| Source: NAFO Data Extraction Tool (Statlant 21A) | |

**Figure 3.24 Canadian and International Fishing Activity by Species in NAFO Division 3L (2016)**

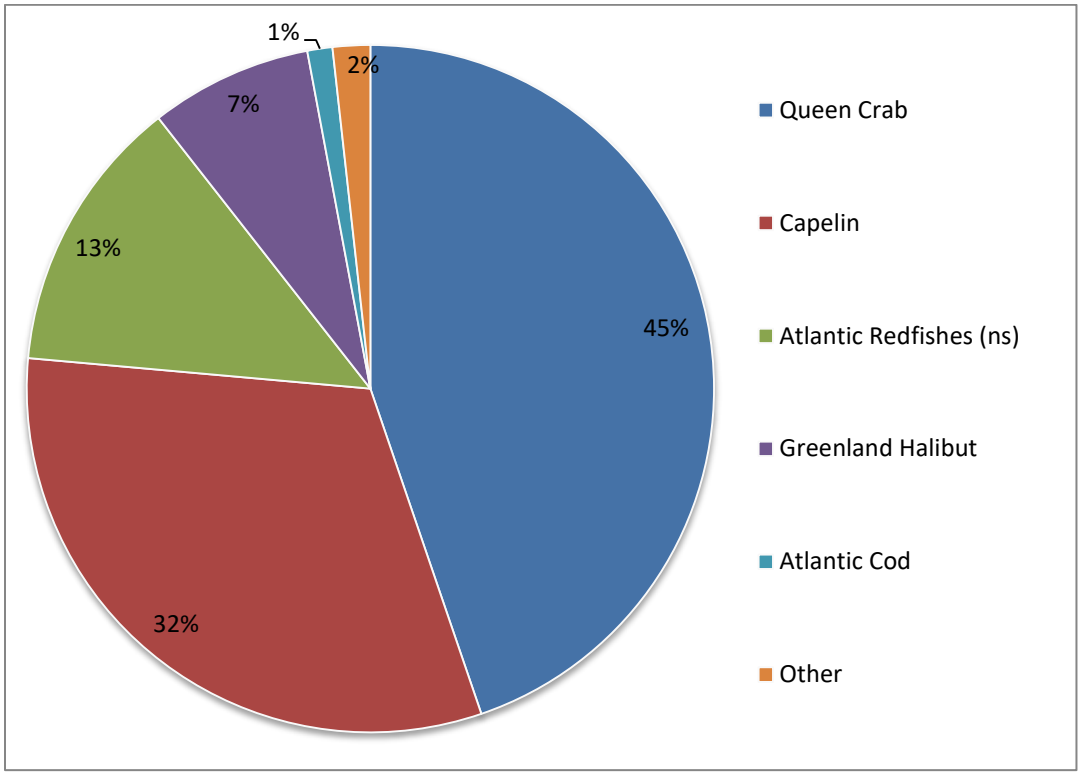
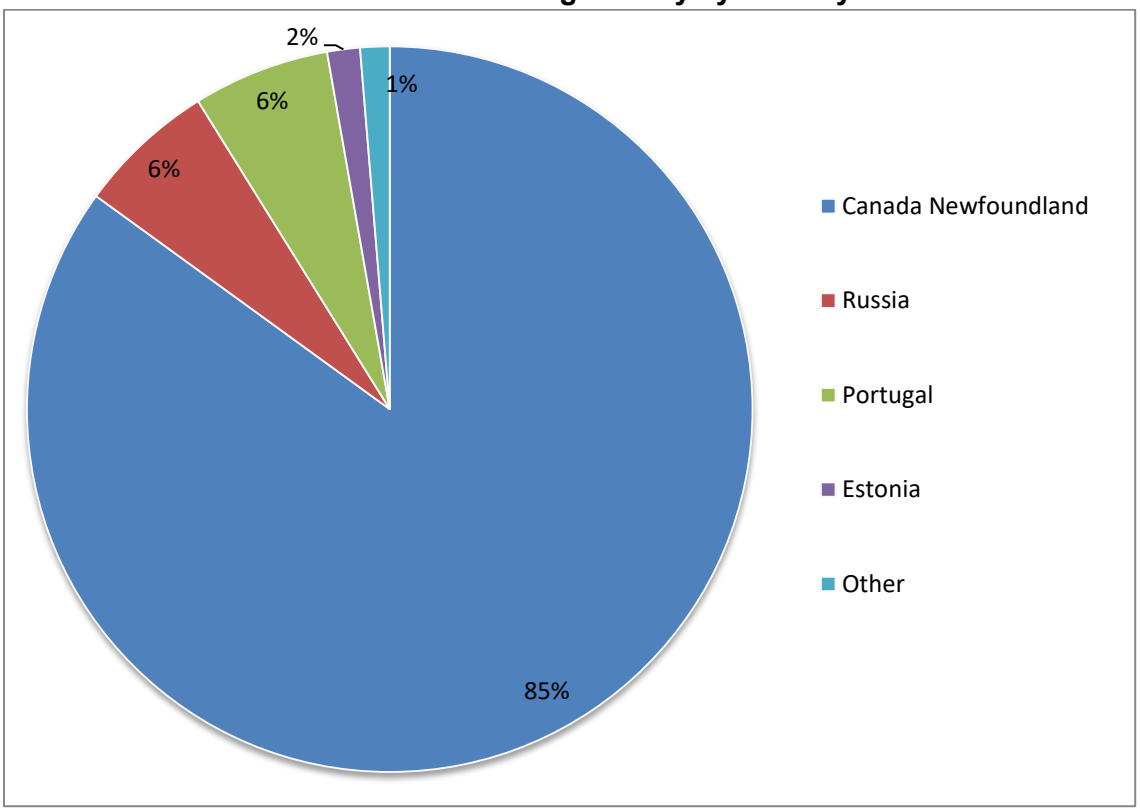



**Table 3.13 Canadian and International Fishing Activity by Country in NAFO Division 3L (2016)**

| Country | Total Catch (tonnes) |
|---|---|
| Canada Newfoundland | 43,464 |
| Russia | 3,145 |
| Portugal | 3,115 |
| Estonia | 747 |
| Other | 669 |
| Total | 51,140 |
| Source: NAFO Data Extraction Tool (Statlant 21A) | |

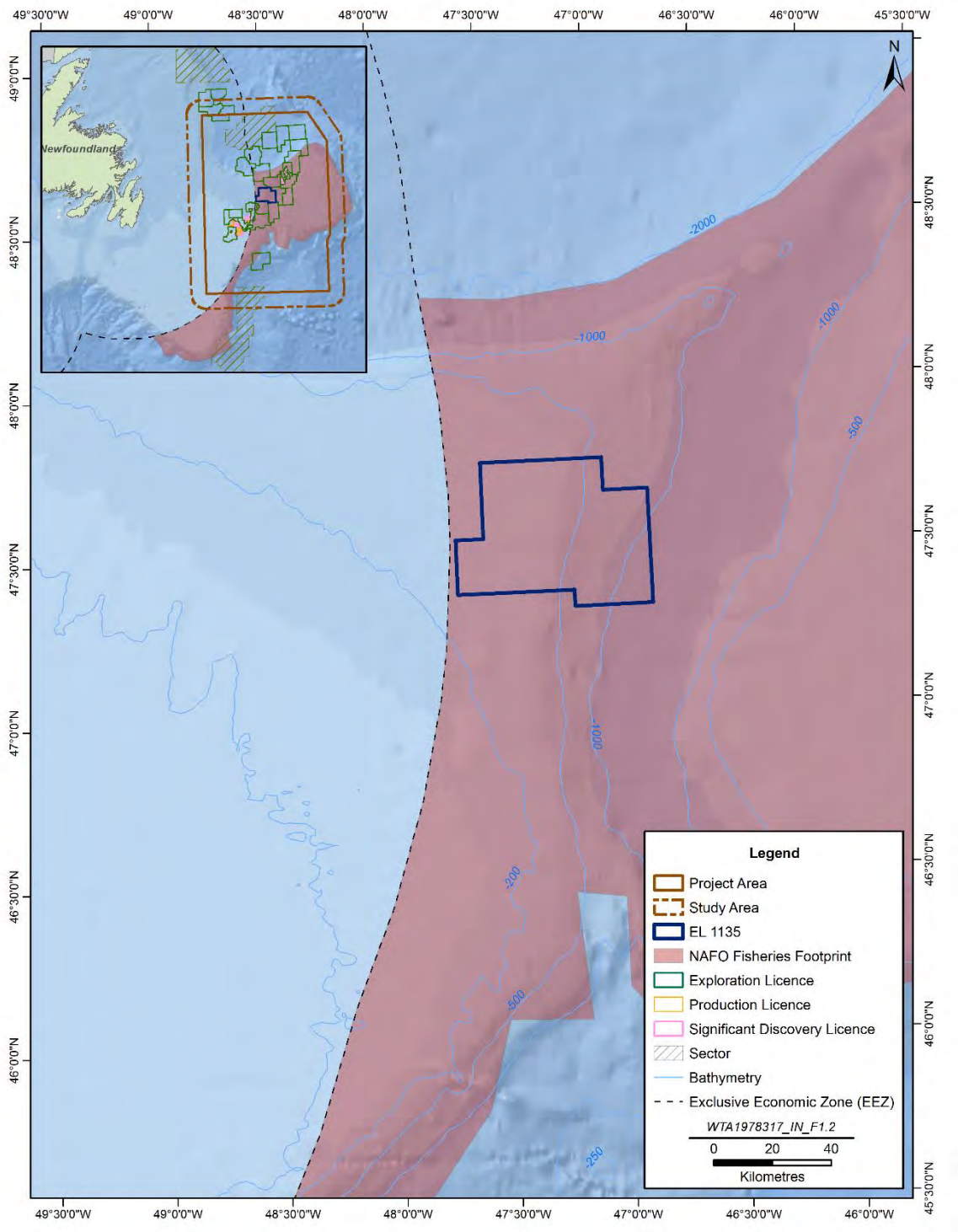
**Figure 3.25 Canadian and International Fishing Activity by Country in NAFO Division 3L (2016)**




The NAFO Regulatory Area (NRA) is approximately 2,707,895 km$^2$ in area (or 41 percent of the total NAFO Convention Area) and comprises the part of the Northwest Atlantic high seas located adjacent to Canada's EEZ. Fishing activity in the NRA targets a range of species including cod, redfish, Greenland halibut, shrimp, skates and other finfish, with an approximate landed value of $200 million annually across all member states. The approximate 160 fishing vessels, authorized to fish in the NRA, are primarily large vessels (30-100 m), and in 2013 a total of 64 vessels fished in the region (NAFO 2014, cited in Amec 2014).

As a result of the 2007 United Nations General Assembly (UNGA Res. 61/105, paragraph 83) request that Regional Fisheries Management Organizations regulate bottom fisheries that result in significant adverse impact on VMEs, NAFO has identified bottom fishing areas in the NRA, and thus has identified and mapped NAFO's bottom fishing footprint. The NAFO footprint is 120,048 km$^2$ in area (NAFO 2009, 2014, cited in Amec 2014), and its location and relationship to the EL 1135 is illustrated in Figure 3.26.

## Figure 3.26 NAFO Fisheries "Footprint" and its Proximity to EL 1135



# 4 SUMMARY AND CONCLUSION

ExxonMobil is undertaking a marine petroleum exploration program, including geophysical, geochemical, environmental and geotechnical survey activities, in the eastern portion of the Canada-Newfoundland and Labrador Offshore Area. EA approval for the Project was received from the C-NLOPB on June 9, 2016. This document comprises the 2019 EA Update for the Project.

As described in the preceding sections, the planned 2019 activities associated with the Project are 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 Report and subsequent EA Addendum, Amendment, and Update submissions) therefore remain applicable to the nature and scope of the planned 2019 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 ExxonMobil's commitments and obligations pursuant to the Project's EA approval and other applicable legislative and regulatory requirements (Appendix B).

The additional information provided through this EA Update do not result in any changes in the original environmental effects predictions, required mitigation or associated determinations related to environmental effects significance for any component of the environment. Overall, the proposed Project will entail a very localized, short-term and transient disturbance in the marine environment at any one location and time throughout the operational life of the exploration program. It is therefore not anticipated to displace or otherwise affect marine fish, birds, mammals, turtles, fisheries or other marine activities in such a way that causes negative and detectable effects to populations, species at risk or human activities in the region.

The Project – including the planned 2019 Project survey activities described herein - is therefore not likely to result in significant adverse environmental effects.

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# APPENDIX A

## Mitigation Measures Identified and Committed to in the EA Report and EA Addendum and Amendment

| MITIGATION MEASURES IDENTIFIED AND COMMITTED TO IN THE EA REPORT AND EA ADDENDUM AND AMENDMENT | STATUS (Indicates those which are applicable to, and will be implemented during the planned 2019 Project Activities) |
|---|---|
| Project survey activities are in locations that avoid the potential for adverse interactions with on-land or near shore environmental components or activities. | YES<br>All planned 2019 survey activities will take place several hundred kilometres offshore, east of the 200 nautical mile EEM |
| Operational planning will also include attempting to avoid any known and observed significant aggregations of marine animals where possible in the planning and conduct of the marine exploration activities that comprise this Project. | YES |
| Seismic sound levels will be kept at the minimum level possible for the survey, based on the vessel's seismic sound source capability and associated requirements. | YES |
| A 30 minute observation for the presence of marine mammal will be followed by a gradual "ramp-up" procedure of the seismic source array over a minimum 20 minute period at the commencement of seismic survey activity, to allow any mobile marine animals to move away from the area. | YES<br>As per procedures outlined in the "*Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*". |
| A planned shut-down of the seismic sound sources or reduction to firing the smallest, single source element during survey line changes and maintenance activities. During line turns a single source element will be fired at least once every 30 minutes. | |
| During the seismic surveys a "safety zone" will be established that will comprise a circle with a radius of at least 500 m as measured from the center of the air source array. During daylight hours a qualified Marine Mammal Observer (MMO) will continuously observe the safety zone starting at least 30 minutes before seismic source array start up when the safety zone is visible, and will maintain a regular watch of the safety zone at all other times when the array is active. | |
| Once operational, the sound source array will be shut down immediately if either of the following is observed by the MMO within the 500-m safety zone: 1) a marine mammal or sea turtle listed as Endangered or Threatened on Schedule 1 of the *Species at Risk Act*; or 2) any other marine mammal or sea turtle that has been identified in the Environmental Assessment process as a species for which there could be significant adverse effects. | |
| The Project will be planned and implemented so as to avoid or minimize environmental discharges and emissions from planned operations and activities. This will be achieved through compliance with relevant regulations and standards and company procedures regarding material selection and use, waste management, discharge | YES |

| MITIGATION MEASURES IDENTIFIED AND COMMITTED TO IN THE EA REPORT AND EA ADDENDUM AND AMENDMENT | STATUS (Indicates those which are applicable to, and will be implemented during the planned 2019 Project Activities) |
|---|---|
| prevention and management and other potential liquid, solid or air emissions. | |
| Project equipment selection will include the planned use of gel filled or solid streamers to prevent potential hydrocarbon spills into the marine environment in the event of a streamer tear or break. | YES |
| The amount, duration and frequency of lighting used on offshore vessels and equipment will be minimized to the degree possible, while at the same time ensuring and maintaining a safe work environment. This will occur particularly during periods when migratory birds are especially vulnerable to disturbance and associated effects (such as during spring and fall migration and in inclement weather). | YES |
| Protocols and programs will be established and implemented for the collection and release of any marine birds that become stranded on offshore installations, which will be implemented by qualified and experienced personnel and in compliance with associated regulatory guidance and applicable CWS Permit requirements. | YES |
| Prior to undertaking seabed sampling work in areas that have been identified as having a high probability of occurrence of corals and sponges a representative seabed characterization (reconnaissance) drop camera / video system survey transect will be acquired to investigate the potential presence of these sensitive benthic organisms.<br><br>Should the above referenced drop camera / video surveys indicate the presence of sensitive benthic organisms within a planned area of seabed sampling (i.e., only those areas identified in Figure 4.24 in the EA Report as high density areas and Protection Zones for corals, seamounts and sponges), the appropriate mitigative response to this finding will depend on a variety of factors, including: the type of organism(s) observed; their relative abundance and overall size of area occupied; the (relatively small) footprint of the seabed sampling equipment and the presence of suitable, alternative sampling locations nearby; the locational precision of the drop camera / video survey (due to water depths, currents, cable lengths and associated sway); and other factors. Should such organisms be observed on-site during the conduct of the field program, the relevant technical crew and ExxonMobil representatives will discuss to determine the appropriate mitigation approach. In any cases where sampling activities are planned to occur within identified high potential areas for the occurrence of such species, ExxonMobil will discuss this with relevant DFO representatives in advance of the | YES |

| MITIGATION MEASURES IDENTIFIED AND COMMITTED TO IN THE EA REPORT AND EA ADDENDUM AND AMENDMENT | STATUS (Indicates those which are applicable to, and will be implemented during the planned 2019 Project Activities) |
|---|---|
| survey mobilization to discuss and consider potential mitigation approaches in the event that such species are observed at planned sampling locations in the field | |
| All Project vessels will have spill prevention procedures and materials in place. This will include appropriate equipment and procedures to help prevent such accidental spills into the marine environment, as well as an Oil Spill Response Plan in the unlikely event of a spill. | YES<br>Appropriate equipment and procedures will be in place to help prevent such accidental spills. In the unlikely event of the accidental release of hydrocarbons or other materials during the Project, ExxonMobil and its survey contractor will implement the measures outlined in its Oil Spill Response Plan. In addition, ExxonMobil has an Emergency Response Plan in place which will apply to the activities that are part of this Project |
| Communications and coordination procedures with regulatory authorities, stakeholders and key ocean users will be used throughout the operational life of the Project. This will include: | |
| - On-going information gathering on key fishing areas and times and continued monitoring of fishing activity (through the presence on a Fisheries Liaison Officer (FLO) on the acquisition vessel and review of DFO VMS data and other sources) and associated survey and logistical planning to minimize interference with fishing activities; | YES |
| - The presence, active participation and advice of the FLO on board the seismic ship, and a shore-based Single Point of Contact (SPOC). The FLO will be a FFAW – Unifor member, and will be responsible for communicating with fishing vessels at sea and relaying information to shore as needed. FLOs will serve as the primary at-sea liaison between the commercial fishing industry and the seismic survey program. | YES |
| - The issuance of Notices to Mariners and other notifications and direct industry communications (e.g., CBC Fisheries Broadcast) throughout the periods of Project operations; | YES |
| - Regular communication of planned survey activities with key industry representatives, and on-going liaison with FFAW / One Ocean contacts; | YES |
| - A standby or guard vessel will be used to scout for hazards and for interacting and communicating with other users of the area about the survey and associated equipment | Standby/guard vessel will not be used during site-investigation/geohazard survey<br>One or more standby/guard vessel(s) would be used during any planned 2D, 3D |

| MITIGATION MEASURES IDENTIFIED AND COMMITTED TO IN THE EA REPORT AND EA ADDENDUM AND AMENDMENT | STATUS (Indicates those which are applicable to, and will be implemented during the planned 2019 Project Activities) |
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| (especially streamers), and to assist in communicating and working with active fishers in the area (if any). The guard vessel will also provide a means for towing the seismic vessel in the case of a loss of propulsion. | or 4D exploration surveys undertaken as part of this Project. |
| - Appropriate spatial and temporal avoidance of active fisheries science survey areas through on-going discussion and coordination with DFO and industry contacts. | YES |
| Establishment and implementation of a Fishing Gear Damage or Loss Compensation Program and communication of this and its associated procedures (through SPOC and otherwise), should there be gear damage caused by direct interactions with seismic streamers or other Project equipment, or in the unlikely event of an offshore spill. | YES |