Eastern Newfoundland Offshore Exploration Drilling Project 2018-2029

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

2022 Environmental Assessment Update

FINAL REPORT

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1 INTRODUCTION

ExxonMobil Canada Ltd. (ExxonMobil) is undertaking a marine petroleum exploration program, including seabed survey activities and exploration drilling in the eastern portion of the Canada-Newfoundland and Labrador Offshore Area (hereinafter also referred to as the Project).

As part of the initial required regulatory review and approval processes, ExxonMobil filed separate Environmental Assessments (EA) for marine exploration and exploration drilling programs detailed in Table 1-1 and summarized below:

- Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical (GGEG) Programs EA was planned, prepared and submitted in compliance with EA requirements and regulatory agency processes of the *Canada – Newfoundland Atlantic Accord Implementation Act* and the *Canada – Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (Accord Acts), including a project-specific EA Scoping Document

- Eastern Newfoundland Offshore Exploration Drilling Project was planned, prepared and submitted in compliance with EA requirements and regulatory agency processes of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012)

The planned program for 2022 includes activities from both the GGEG Program EA and the Exploration Drilling Environmental Impact Statement (EIS). This document will provide an update for both EA's.

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

- An overview of the planned Project activities for the upcoming year (Section 2.0);
- Information on consultation and engagement activities undertaken (Section 2.3);
- Updated applicable baseline information for key environmental components since the initial EA and associated updates were produced (Section 3.0), specifically, updated information regarding:
  - Species of conservation concern (Section 3.1);
  - Special areas (Section 3.2); and
  - Commercial fisheries (Section 3.3).
- Update on worst-case scenarios for accidental events (Section 4.0); and
- Evaluation and confirmation that the nature and scope of the planned activities are within the scope of the approved EIS (Section 5.0).

Table 1-1: Environmental Assessment Summary

Project	Eastern Newfoundland Offshore Exploration Drilling Project (2018-2029)	Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical (GGEG) Programs (2015-2024)
Environmental Assessment Documents	• EIS (ExxonMobil Canada Ltd 2017) • EIS Addendum (ExxonMobil Canada Ltd 2018c) • Response to Information Requirements (ExxonMobil Canada Ltd 2018b, Equinor Canada Ltd. and ExxonMobil Canada Ltd 2018a, 2018b, ExxonMobil Canada Ltd 2018d, Equinor Canada Ltd. and ExxonMobil Canada Ltd 2018c, ExxonMobil Canada Ltd 2018e) • Decision Statement (ECCC 2019)	• Environmental Assessment (EA) Report (ExxonMobil Canada Ltd 2015) • EA Addendum and Amendment (ExxonMobil Canada Ltd 2016) • EA Updates (ExxonMobil Canada Ltd 2018a, 2019) • Determination of Significance (C-NLOPB 2016)
Reference Number	Canadian Impact Assessment Registry (CIAR) 80132	-
Temporal Scope	Year-round, 2018-2029 inclusive	Year-round, 2015-2024 inclusive
Geographic Scope	Eastern Offshore NL (Figure 2-1)	Eastern Offshore NL (Figure 2-2)
Planned 2022 Project Activity	Licence Area: EL 1165A Drilling Operations (including site preparation activities, environmental monitoring, and inspections) Supply and Servicing Follow up monitoring	Licence Area: EL 1151A Seabed surveys Supply and Servicing

2 PROJECT DESCRIPTION

The following provides a brief overview of the original Project Description (as provided in the initial EA Reports) for background and context, followed by a description of ExxonMobil's planned 2022 Project activities.

2.1 Overview of the Original Project Description

2.1.1 Eastern Newfoundland Offshore Exploration Drilling Project

The Exploration Drilling Project includes the planned conduct of an oil and gas exploration program offshore Eastern Newfoundland over the 2018 to 2029 period as described in the original EIS (November, 2017) and associated Addendum (September 2018) (ExxonMobil Canada Ltd 2017, 2018c). This includes the drilling, testing, and eventual decommissioning of exploratory wells within

various Operator-held ELs in the region, as well as possible delineation drilling in the case of a hydrocarbon discovery, geohazard / wellsite surveys, vertical seismic profiling, possible batch drilling, formation flow testing with flaring, geotechnical surveys, environmental surveys, remotely operated vehicle (ROV) / video surveys, and potential wellhead decommissioning / removal, as well as associated supply and service activities.

The Project Area encompasses the overall marine area within which all Project-related exploration drilling components and activities will take place and is located off the eastern coast of the Island of Newfoundland. It includes exploration licences (ELs) currently operated by ExxonMobil and other licences in which ExxonMobil is a co-venturer. The Project Area covers an area of 100,800 km^2, and is 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 will be completed within the identified Project Area boundary; and planned drilling activities will take place within the boundaries of the ELs. Water depths in the Project Area range from approximately 70 m to 3,000 m.

ExxonMobil's EIS concluded (refer to Section 17.6 of the EA Report) that*: "the planned components and activities that will be associated with the Project will entail highly localized, short-term, and transient disturbances in the marine environment at any one location within an EL and time throughout the operational life of this exploration program, the potential effects of which will be effectively avoided or minimized through the various regulated or otherwise implemented mitigations*" (Refer to Table 17.2 Summary of Mitigation and Commitments in the EIS, ExxonMobil Canada Ltd 2017)*. "The Project is therefore not anticipated to disturb, displace, or otherwise affect marine fish, birds, mammals, turtles, Indigenous communities and activities, fisheries or other human components and activities in such a way that causes negative and detectable effects to populations, species at risk or human activities in any location"* (ExxonMobil Canada Ltd 2017).

Regarding accidental events (batch spills and blowouts), the EIS concluded that: *"a blowout event is an extremely unlikely occurrence, and would be avoided through oil spill prevention measures and if it occurred, would be acted upon quickly. In addition, the subsequent (post-EA) regulatory approvals process that apply to the Project are amongst the most rigorous and stringent in the world, where operators are required to demonstrate that they have the ability and capacity to undertake such activities in a safe and environmentally responsible manner through various project design measures, operational procedures, and response mechanisms. These Operator-implemented mitigations and associated regulatory review processes will help to ensure that such an accidental event does not occur, and in the unlikely event that one did, will serve to reduce any potential environmental effects."*

ExxonMobil will continue to implement the mitigation measures as described in the approved Exploration Drilling EIS for 2022 Project Activities. The proposed Project is therefore not likely to result in significant adverse environmental effects.

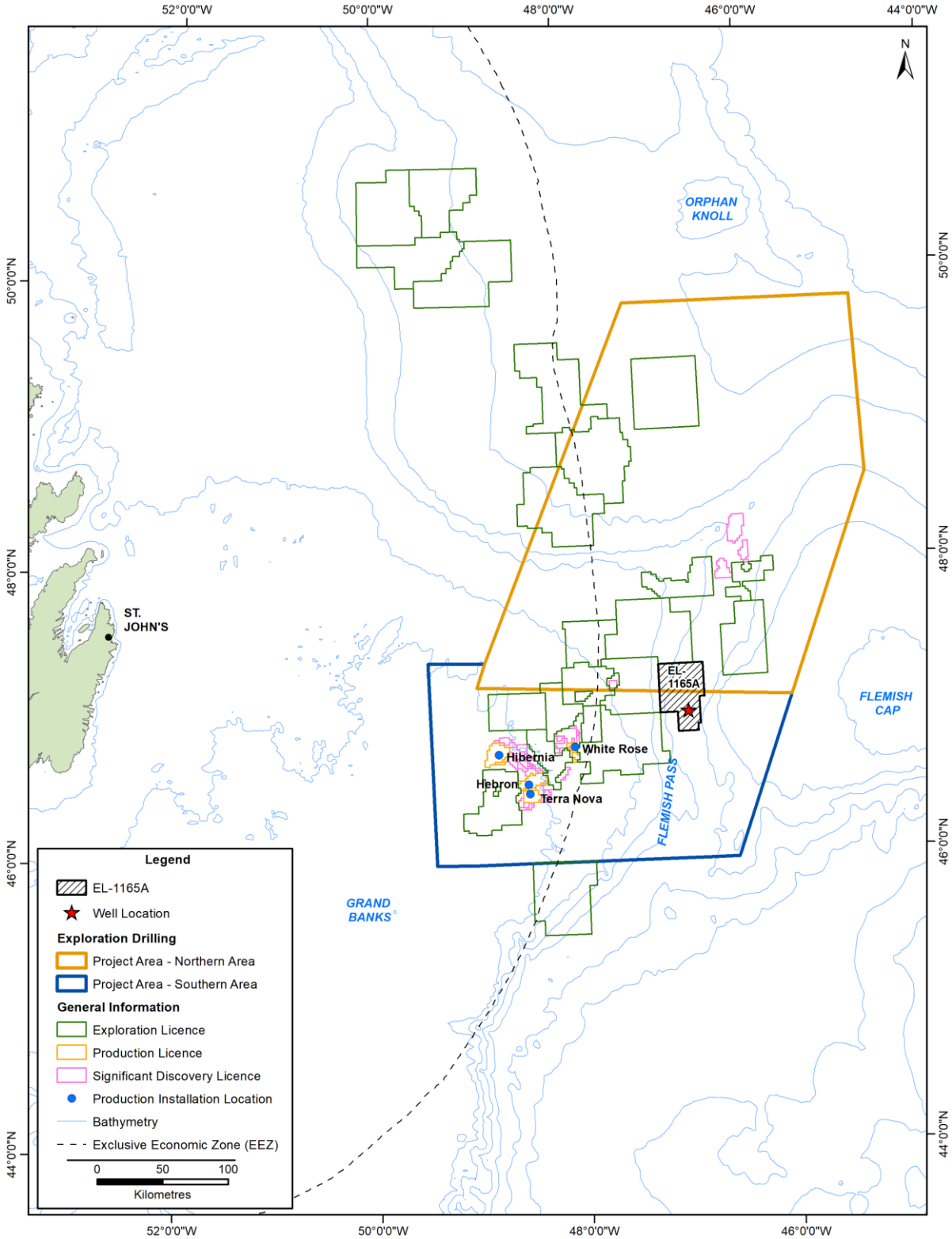

Figure 2-1: Project Areas for the Exploration Drilling Activities.

2.1.2 Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs

The GGEG Program includes the proposed conduct of offshore exploration activities over ExxonMobil Exploration Licences (ELs) and other areas of interest within the Project Area (Figure 2-2) annually over the 2015-2024 period as described in the original EA Report (July 2015) (ExxonMobil Canada Ltd 2015) and associated Addendum and Amendment (May 2016) (ExxonMobil Canada Ltd 2016). Planned Project activities include 2D and 3D seismic surveys, as well as wellsite geohazard, geochemical, geotechnical and environmental survey activities.

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 is illustrated in Figure 2-2, portions of the Project Area are located within Canada's 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.

ExxonMobil's EA Report concluded (refer to Section 6 of the EA Report) 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."* (Refer to Section 5.3 Environmental Planning, Management and Mitigation of the EA Report, ExxonMobil Canada Ltd 2015). *"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"* (ExxonMobil Canada Ltd 2015).

ExxonMobil will continue to implement the mitigation measures as described in the approved GGEG Program EA for 2022 Project Activities. The proposed Project is therefore not likely to result in significant adverse environmental effects.

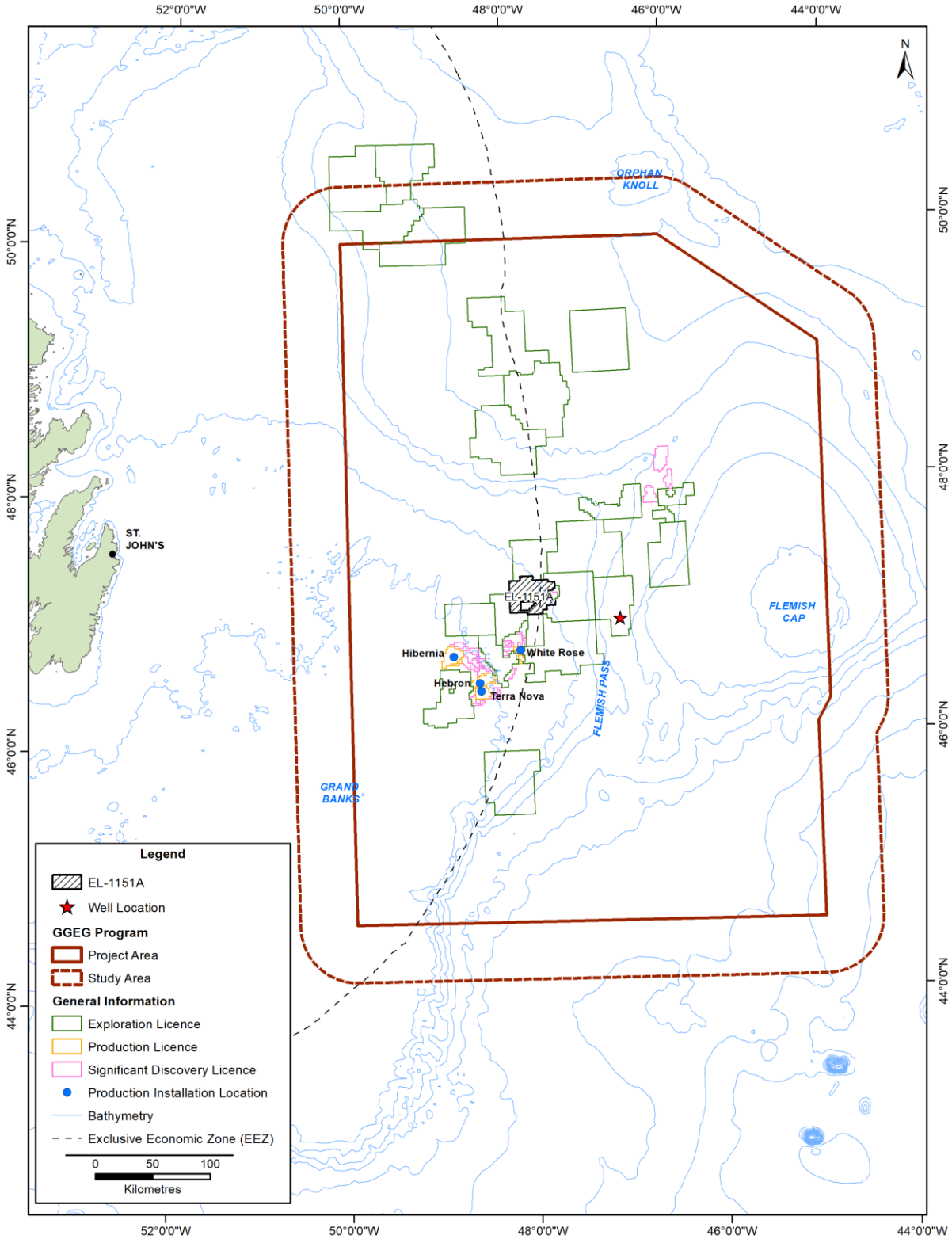

Figure 2-2: Project Areas for the Geophysical, Geochemical, Environmental and Geotechnical Program.

2.1.3 EA Commitments, Conditions, and Mitigations

Environmental assessment commitments and conditions that are applicable to 2022 activities are outlined in the EIS and EA report, responses to select Information Requirements and conditions detailed in the Decision Statement and Determination of Significance (Table 1-1). Mitigations applicable to 2022 activities are detailed in the EAs:

- Table 17.2 Summary of Mitigation and Commitments of the Exploration Drilling EIS, (ExxonMobil Canada Ltd 2017)
- Section 5.3 Environmental Planning, Management and Mitigation of the GGEG Program EA Report (ExxonMobil Canada Ltd 2015)

2.2 Planned 2022 Project Activities

Planned project activities in 2022 include the completion of exploration drilling, seabed survey, and associated follow-up monitoring and supply and servicing within ExxonMobil operated ELs in the Project Area (see Figure 2-1 and Figure 2-2).

2.2.1 Drilling Operations

ExxonMobil is currently planning to drill one firm well in 2022: Hampden K-41. The Hampden prospect is located on EL 1165A where ExxonMobil is the Operator (60% interest) alongside interest holder, QPI Energy Canada Ltd. (40% interest). The exploration well will be drilled in 1180 m water depth using a harsh environment dynamically positioned drill ship, the Stena Forth. Planned activities in support of these operations include inspection, maintenance, repairs, construction, modification and decommissioning activities, and all support activities that are periodically required in connection with drilling and appraisal activities. Pre-drilling activities will include site preparation activities and deployment of monitoring equipment, such as met-ocean equipment. ROV inspection surveys, ROV seabed surveys, and drilling program pre-lay work such as transponder beacon deployment, are also planned as part of project activities. Following drilling completion, vertical seismic profiling (VSP) (seismic) surveys will be conducted to obtain accurate time-to-depth ties to correlate seismic data to well depth. Starting in early July 2022, it is estimated that the well will require approximately 45 to 70 days for drilling, evaluation, associated well abandonment or suspension and completion of follow up programs.

2.2.2 Follow-up Monitoring

ExxonMobil will be conducting follow-up monitoring for exploration drilling activities in EL 1165A as part of conditions of release from the EA process. Follow-up monitoring activities will be used to verify the accuracy of the effects assessment and will include drill cuttings monitoring, bird monitoring, and marine mammal and sea turtle monitoring during VSP.

2.2.3 Seabed Surveys

ExxonMobil is planning to conduct environmental characterization surveys over future potential well locations in EL 1151A to collect information about corals and sponges, benthic macrofauna, and surficial substrate. The information will be used to inform well site location and for future comparisons as part of eventual follow-up monitoring. The video surveys will be conducted with ROV over potential well site

locations and consider the area of modelled drill cuttings dispersion. This activity will occur in late August or early September 2022.

2.2.4 Supply Vessels

It is anticipated that a minimum of three supply vessels that are suited to the operating environment and Project Activities will be used for the duration of the exploration drilling campaign at any given time. Shore-based facilities in or near St. John's will be used by the vessels and existing port infrastructure will be used for all support aspects.

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 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. Table 2-1 details engagement activities for the 2022 project activities.

Table 2-1: Engagement Activities for the 2022 Exploration Program Activities.

Stakeholder Group	Description of Engagement
Commercial Fishers	• September 2021 - Program update provided to One Ocean working group; • September 2021 - Program update provided at September One Ocean Board meeting; • January 2022 - Program update provided to One Ocean working group; • January 2022 - Program update provided at January One Ocean Board meeting; • April 2022 - Program update provided to One Ocean Director; • April 2022 - Program update provided to One Ocean, Fish Food and Allied Workers Union (FFAW-Unifor), Ocean Choice International (OCI), Atlantic Groundfish Council (AGC) and Association of Seafood Producers (ASP); • April 2022 – Provided location specific details to AGC as requested; • April 2022 – Meeting with FFAW-Unifor to discuss 2022 activities and requirement for a fisheries liaison for drillship transit from nearshore staging location to well site; • April 2022 – Updated draft of Fisheries Communications Plan sent to One Ocean for review/feedback; • April 2022 – Provided updated copy of Fisheries Communications Plan to One Ocean, FFAW-Unifor, OCI, AGC and ASP; • May 2022- Program update provided to One Ocean, FFAW-Unifor, OCI, AGC and ASP.
Indigenous Groups	• April 2022 - Program update provided to Indigenous Groups. Request from one Indigenous group for the update to be provided in French which was completed; • May 2022 – Program update provided to Indigenous Groups.
Fisheries and	• March 2022 – Consult with C-NLOPB and Department of Fisheries and

Stakeholder Group	Description of Engagement
Oceans Canada	Oceans Canada (DFO) on 2022 Drill Cuttings Dispersion Follow Up Program for EL 1165A; • March 2022 – Consult with C-NLOPB and DFO on 2022 site survey design for EL 1151A; • June 2022 - Feedback received from DFO on 2022 site survey design for EL 1151A.
Environment and Climate Change Canada	• April 2022 – Feedback received from Environment and Climate Change Canada's (ECCC) Canadian Wildlife Service (CWS) division on Seabird Monitoring Plan; • May 2022 – Meeting with ECCC – CWS to discuss Seabird Management Plan comments; • May 2022 – Consult with ECCC-CWS on Scientific Seabird Permit; • June 2022 – Provided copy of Physical Environmental Monitoring Plan.
Impact Assessment Agency of Canada	• February 2002 - Consult with C-NLOPB and the Impact Assessment Agency of Canada regarding the revised worst-case discharge rate for the planned Hampden K-41 well for an unmitigated hydrocarbon release.

3 ENVIRONMENTAL SETTING AND ASSESSMENT

The original EAs and associated addendum and update documents provide overviews of the existing physical, biological, and socio-economic environment within and around the Project Areas. The following sections provide updated information for the following key environmental components:

- Species of Conservation Concern
- Special Areas
- Commercial Fisheries

3.1 Species of Conservation Concern

Since the original EAs, the conservation status of several species of marine fish, marine birds and marine mammals within the Project Areas has changed. These changes include a reassessment of a species' status by their respective agency, either the International Union for the Conservation of Nature (IUCN) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). No changes have taken place to species listed by either the *Newfoundland and Labrador Endangered Species Act* (NL ESA) or the *Species at Risk Act* (SARA).

3.1.1 Marine Fish

The conservation status of several fish species within the Project Areas has changed (Table 3-1) since the most recent approved EA document for each project. Details on marine fish species of conservation concern were most recently described in:

- Exploration Drilling Project EIS (ExxonMobil Canada Ltd 2017): Section 6.1.8
- Exploration Drilling Project EIS Addendum (ExxonMobil Canada Ltd 2018c): Section 4.2.1.5

- GGEG Programs EA Update (ExxonMobil Canada Ltd 2019): Section 3.1.1

Updates to species of conservation concern across the Study Areas of both EAs include the following:

- Atlantic bluefin tuna (*Thunnus thynnus*): Designation was changed during 2021 IUCN Assessment from “Endangered” to “Least Concern”(Collette et al. 2021);
- Basking Shark (*Cetorhinus maximus*): Designation was changed during 2021 IUCN Assessment from “Vulnerable” to “Endangered” (Rigby et al. 2021);
- Common Lumpfish (*Cyclopterus lumpus*): Designated as “Threatened” during the November 2017 COSEWIC assessment. (Exploration Drilling Project Update only) (COSEWIC 2019);
- Haddock (*Melanogrammus aeglefinus*): Designated as “Vulnerable” during the 1996 IUCN Assessment (Sobel 1996) (Exploration Drilling Project Update only)
- Shortfin mako (*Isurus oxyrinchus*): Designation was changed during the May 2019 COSEWIC assessment from “Special Concern” to “Endangered”(COSEWIC 2017a); and in November 2018 IUCN Assessment from “Vulnerable” to “Endangered” (Rigby et al. 2019).
- Smooth Skate (*Malacoraja senta*): Designation was changed during 2020 IUCN Assessment from “Endangered” to “Vulnerable”(Kulka et al. 2020).
- White Hake (*Urophycis tenuis*): Designated as “Threatened” during the November 2013 COSEWIC assessment (COSEWIC 2014) (Exploration Drilling Project Update only)
- White Shark (*Carcharodon carcharias*): Designation remained as “Endangered” during the May 2021 COSEWIC Assessment (COSEWIC 2021a)

No additional biological or ecological information is included here for Atlantic Bluefin Tuna, Basking Shark, Shortfin Mako, Smooth Skate and White Shark as they were included in the original EIS. Biological information for these species can be found in Section 6.1.8 and Section 4.2.1.6 of the Exploration Drilling Project and GGEG Program EAs respectively.

Common Lumpfish, White Hake, and Haddock are potential species that may be within the Exploration Drilling Project Area. Common Lumpfish have been classified as “Threatened” due to significant declines in abundance over the last 20 years off southern Newfoundland (COSEWIC 2019). Lumpfish are commonly distributed in demersal and pelagic zones throughout the North Atlantic Ocean and can be found throughout the Grand Banks out to the Flemish Cap. Lumpfish occupy several habitats throughout their life stages. Mature lumpfish spend a large amount of time near the ocean floor but are considered semi-pelagic. Females lay their eggs in inshore rocky areas and young lumpfish occupy near-surface waters attaching themselves to floating macroalgae as well as other structures and debris. Common Lumpfish feed on a variety of small pelagic and benthic prey, including eggs and larvae, small jellies, small invertebrates and fish (Simpson et al. 2016, COSEWIC 2019). Temperature preference ranges from 4-12°C for larvae and young of the year, and -1.9-12°C for juveniles and adults. The main threats that have been identified for lumpfish in Canadian waters include fishing, habitat alterations, predation, and seismic exploration.

White Hake are classified as “Endangered” in the Southern Gulf of St. Lawrence population and “Threatened” in the Atlantic and Northern Gulf of St. Lawrence (COSEWIC 2014). The Atlantic and Northern Gulf of St. Lawrence population (DU2) which occurs on the Scotian Shelf, Northern Gulf of St. Lawrence, and Southern Newfoundland has declined 70% in the last 30 years. The greatest threats to White Hake populations is predation, directed fishing mortality and bycatch (COSEWIC 2014). White

Hake are commonly found on, or near, bottom over fine sediment substrates. Larger individuals often occur in 200 m or deeper waters, and juveniles in shallow areas inshore or on offshore banks, with little seasonal movements off of Southern NL (COSEWIC 2014). White Hake were not associated with assemblages on the Flemish Cap (Nogueira et al. 2017), and areas of aggregation are largely outside of the Project Area based on Canadian research vessel (RV) surveys. Juvenile and adult hake primarily feed on crustaceans and fish and are prey species for other fish, seabirds, and seals (COSEWIC 2014). Temperature preference ranges from 4-8℃ with spawning occurring in early spring, and occasionally again in the summer.

Haddock is a member of the cod family and are globally listed as “Vulnerable” (Sobel 1996). They occur throughout the North Atlantic including off the southwest coast of Newfoundland and St. Pierre Bank, with areas of concentration at the Laurentian Channel Slope, and the Southwest Slope of the Grand Bank (Kulka et al. 2003). Haddock occur in a variety of benthic habitats and prefer hard sand or gravel bottom. This species typically feeds on a variety of small invertebrates and fish (DFO 2002). Temperature preference ranges from 1.0-13℃ at depths of 27-366 m (Begg 1998). While this species has been identified as a species of conservation concern by the IUCN, it does not have NL ESA, SARA or COSEWIC designations.

The potential environmental effects on these species are similar to those outlined for other marine finfish in the EAs, and the species-specific description given in the EAs (ExxonMobil Canada Ltd 2015, 2018c). Mitigation measures described in the original Exploration Drilling EIS for other marine finfish species will also apply to common lumpfish, white hake and haddock, and thus Project activities are not likely to result in significant adverse effects.

Since the acceptance of the various EAs and associated updates, the status of some species have improved and have therefore been removed from the listing of species of conservation concern in the region, as listed in Table 3-1. In 2016, the COSEWIC designation for blue shark was changed from “Special Concern” to “Not at Risk”. Since 2018, the IUCN has revised the status of the Barndoor Skate to “Least Concern”. This assessment was based on increasing population trends for these species worldwide. Similarly, the Roughhead Grenadier is now listed by COSEWIC as being “Not at Risk” due to increasing population and reduced bycatch due to improved management of the Greenland Halibut fishery.

Table 3-1: Updated Marine 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	
Acadian Redfish	*Sebastes fasciatus*			T	E	Atlantic (COSEWIC); Global (IUCN)
American Eel	*Anguilla rostrata*	V		T	E	Global (IUCN)
American Plaice	*Hippoglossoides platessoides*			T		Newfoundland and Labrador (COSEWIC)
Atlantic Bluefin Tuna	*Thunnus thynnus*			E	LC	Global (IUCN)
Atlantic Cod	*Gadus morhua*			E	V	Newfoundland and Labrador (COSEWIC); Global (IUCN)
Atlantic Halibut	*Hippoglossus*			NR	E	Global (IUCN)

Species		Status / Designation[1,2]				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
	hippoglossus					
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)
Basking shark	*Cetorhinus maximus*			SC	E	Atlantic (COSEWIC); Global (IUCN)
Bigeye Tuna	*Thunnus obesus*				V	Global (IUCN)
Cusk	*Brosme brosme*			E		
Deepwater Redfish	*Sebastes mentella*			T	LC	Northern (COSEWIC); Global (IUCN)
Haddock	*Melanogrammus aeglefinus*				V	Global (IUCN)
Common Lumpfish	*Cyclopterus lumpus*			T		
Northern (Broadhead) Wolffish	*Anarhichas denticulatus*		T	T		
Porbeagle	*Lamna nasus*			E	V	Global (IUCN)
Roundnose Grenadier	*Coryphaenoides rupestris*			E	CE	Global (IUCN)
Shortfin Mako	*Isurus oxyrinchus*			E	E	Atlantic (COSEWIC); Global (IUCN)
Smooth Skate	*Malacoraja senta*			E	V	Funk Island Deep, Global (IUCN)
Spiny Dogfish	*Squalus acanthias*			SC	V	Atlantic (COSEWIC); Global (IUCN)
Spinytail Skate	*Bathyraja spinicauda*				NT	Global (IUCN)
Spotted Wolffish	*Anarhichas minor*		T	T		
Striped (Atlantic) Wolffish	*Anarhichas lupus*		SC	SC		
Thorny Skate	*Amblyraja radiata*			SC	V	Global (IUCN)
White Hake	*Urophycis tenuis*			T		Atlantic and Northern

Species		Status / Designation[1,2]				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
						Gulf of St. Lawrence (COSEWIC)
White Shark	*Carcharodon carcharias*		E	E	V	Atlantic (COSEWIC/SARA); Global (IUCN)
Winter Skate	*Leucoraja ocellata*			E	E	Eastern Scotian Shelf – Newfoundland (COSEWIC); Global (IUCN)

[1] Not at Risk (NR), Data Deficient (DD), Least Concern (LC), Vulnerable (V), Near Threatened (NT), Special Concern (SC), Threatened (T), Endangered (E), Critically Endangered (CE). Blank cells are considered to be not assessed.

[2] Multiple designations refer to multiple populations or sub-populations.

Grey cells represent changes to status or addition of species listing from the original EIS.

Sources: Sobel 1996, COSEWIC 2014, 2019, Rigby et al. 2019, Kulka et al. 2020, Collette et al. 2021, COSEWIC 2021a, Rigby et al. 2021

3.1.1.1 Recovery Strategies and Plans

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 critical habitat for spotted and northern wolffish was set out in the proposed 2020 Recovery Strategy (DFO 2020) for these species, primarily along the edge of the Grand Banks and Labrador Shelf (Figure 3-1). Proposed critical habitat was described in the GGEG Program EA update and has since been finalized with no changes from the proposed areas (DFO 2020). 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 2.3-5.1°C and function to support all portions of wolffish life history. Spotted wolffish habitats are located between 82-346 m with sea bottom temperatures of 0.1-4.2°C and function to support all portions of wolffish life history. No critical habitat has been established for the Atlantic wolffish (DFO 2020).

There is overlap between the Project Area and spotted and northern wolffish critical habitat in the Project Areas, with EL 1165A (exploration drilling) outside the proposed critical habitat and EL 1151A (seabed surveys) overlapping with spotted wolffish critical habitat (Figure 3-1). Project activities are not likely to result in thermal habitat alteration or habitat destruction that are considered key threats to the critical habitat. These species were also considered and assessed in the EA Report (Section 8.4.1, Exploration Drilling EIS and Section 4.2.1.6, GGEG Program EA) for potential environmental effects of the Project on this species. As environmental surveys in EL 1151A are unlikely to have potential effects on Marine Fish and Fish Habitat and with the implementation of planned mitigation measures, these activities are not likely to result in significant adverse effects on northern and spotted wolffish.

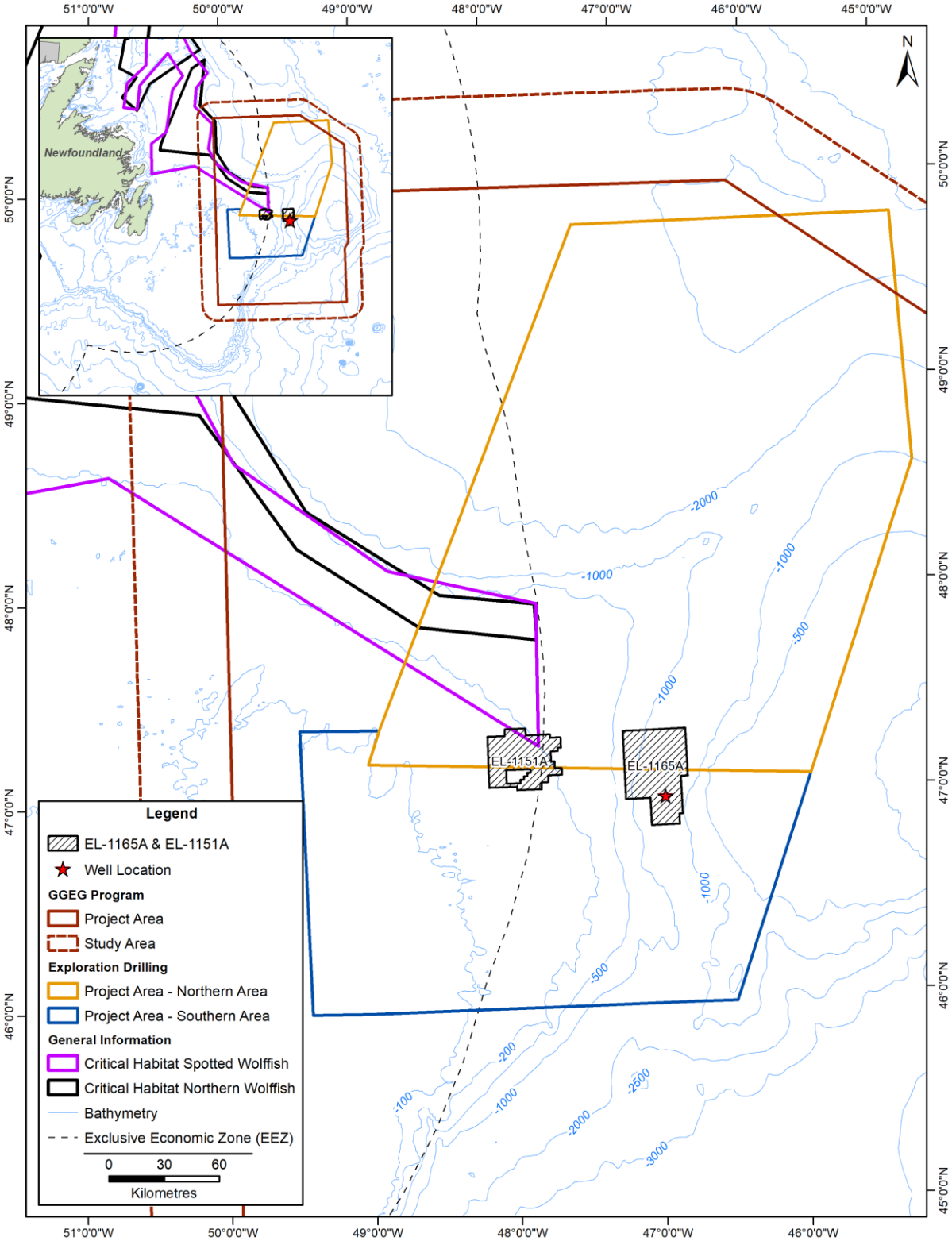

Figure 3-1: Northern and Spotted Wolffish Critical Habitat in relation to the 2022 Project Areas

3.1.2 Marine and Migratory Birds

The conservation status of a few marine bird species within the Project Areas has changed (Table 3-2) since the most recent approved EA document for each project. Details on marine and migratory bird species of conservation concern were most recently described in:

- Exploration Drilling Project EIS (ExxonMobil Canada Ltd 2017): Section 6.2.4
- Exploration Drilling Project EIS Addendum (ExxonMobil Canada Ltd 2018c): Section 4.2.2.5
- GGEG Programs EA Update (ExxonMobil Canada Ltd 2019): Section 3.1.3.1

Updates to species of conservation concern across the Exploration Drilling Project and GGEG Programs include the following:

- Red-necked Phalarope (*Phalaropus lobatus*): Designated as “Special Concern” status on Schedule 1 of the SARA in May 2019 (ECCC 2022);
- Leach’s Storm-Petrels (*Oceanodroma leucorhoa*): Designated as “Threatened” during the November 2020 COSEWIC assessment (COSEWIC 2020); and
- Ross’s Gull (*Rhodostethia rosea*): Designation was changed during the May 2021 COSEWIC assessment from “Threatened” to “Endangered” (COSEWIC 2021b).

Red-necked Phalarope are currently listed as “Special Concern” that are potentially seasonally present in the Project Area and were considered in the original EAs, including details on biological and ecological information used to inform the assessments. A review of the recently released management plan determined that no new or modified mitigation measures are required beyond those already identified in the Exploration Drilling Project and GGEG Program EAs (see Section 3.1.2.1).

Leach’s Storm-Petrel is the smallest and most wide ranging procellariform in the Northern Hemisphere. The Atlantic population is listed as “Threatened” (COSEWIC 2020). There are over 80 nesting colonies in eastern Canada, where adults nest in burrows and forage at night for bioluminescent prey (COSEWIC 2020). Leach’s Storm Petrel is most threatened by changes to the food web and interactions with offshore activity, especially oil and gas platforms, as well as vessels that use artificial lighting due to its unique nocturnal behaviour and its attraction to light. There are indications that major colonies have experienced declines up to 54% over the past 44 years (COSEWIC 2020). While the conservation status of Leach’s storm-petrel has been updated, this species and associated special areas (e.g., Important Bird Areas) were specifically considered in the original EAs. Current mitigations specific to stranded birds in offshore Newfoundland apply to Leach’s storm-petrel (Williams and Chardine 1998), and so potential environmental effects from the project on this species are anticipated to be within EA predictions.

Ross’s Gull is primarily an Arctic species, with the largest breeding area in northeastern Siberia and smaller colonies in Greenland, Svalbard, and Arctic and subarctic Canada. Fewer than 20 individuals are known to breed in Canada, with only 1-3 known colonies in the Canadian High Arctic (COSEWIC 2021b). The species has low productivity and there has been no fledglings in the past 14 years at the only active colony in Canada (COSEWIC 2021b). Adult Ross’s Gulls feed on small invertebrates in freshwater, and small fish and zooplankton while migrating or overwintering at sea (COSEWIC 2021b). These birds overwinter at sea mostly in Arctic waters but have been tracked as far south as the northern portions of the Project Area. As this is primarily an Arctic species and only occasionally known to be

present in the Project Area, interactions with project activities are unlikely. Understanding the threats to Ross's Gulls is ongoing, but high rates of chick mortality in shared colonies (specifically caused by Arctic terns), as well as predation by other predators are thought to be major known threats (COSEWIC 2021b). Infertility and low rates of hatching are also thought to be caused by pollutants in the environment (COSEWIC 2021b).

Mitigation measures described in the original EAs for other marine and migratory bird species will also apply to Ross's Gull, and so the potential environmental effects from the Project are not likely to result in significant adverse effects.

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

Species		Status / Designation[1]				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
Ivory Gull	*Pagophila eburnea*	E	E	E	NT	Global (IUCN)
Red-necked Phalarope	*Phalaropus lobatus*		SC	SC	LC	Global (IUCN)
Leach's Storm-Petrel	*Oceanodroma leucorhoa*			T	V	Atlantic (COSEWIC); Global (IUCN)
Ross's Gull	*Rhodostethia rosea*		T	E	LC	Global (IUCN)

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

Grey cells represent changes to status or addition of species listing from the original EIS.

Sources: COSEWIC 2020, 2021, ECCC 2022

3.1.2.1 Recovery Strategies and Plans

Since the original EAs, a management plan has been proposed for Red-necked Phalarope (ECCC 2022). A review of the plan determined that no new or modified mitigation measures are required beyond those already identified in the Exploration Drilling Project and GGEG Program EAs.

3.1.3 Marine Mammals and Sea Turtles

The conservation status of a few marine mammal species within the Project Areas has changed (Table 3-3) since the most recent approved EA document for each project. Details on marine mammal and sea turtle species of conservation concern were most recently described in:

- Exploration Drilling Project EIS (ExxonMobil Canada Ltd 2017): Section 6.3.7
- Exploration Drilling Project EIS Addendum (ExxonMobil Canada Ltd 2018c): Section 4.2.3.5
- GGEG Programs EA Update (ExxonMobil Canada Ltd 2019): Section 3.1.4.1

Updates to species of conservation concern across the Exploration Drilling Project and GGEG Programs include the following:

- Bowhead whale (*Balaena mysticetus*): Designated as "Special Concern" during the April 2009 Assessment (COSEWIC 2009)

The Bowhead Whale is added as a potential species occurring in the Project Area. The Bowhead Whale is primarily an Arctic species, with rare occurrences in southern Labrador and Newfoundland. The population was severely impacted by commercial whaling activity in the late 1800s and early 1900s. In 1980, the Eastern and Western Arctic populations were listed as "Endangered", and in 2005 the Hudson Bay-Foxe Basin population, part of the Eastern Arctic population, was designated "Threatened" (COSEWIC 2005). The Bowhead Whale is listed as a species of "Least Concern" (IUCN 2018). Historically, the main threat to this species was commercial whaling, today threats include climate change and other human activities such as shipping and noise pollution (COSEWIC 2009). Similar to other large mysticetes, Bowhead Whales reach sexual maturity at around 25 years of age, and only calf every 3 years, with a total lifespan of over 100 years (COSEWIC 2005). The typical range is narrow for the Eastern Canada-West Greenland population and stretches from western Greenland into Hudson Bay and the high Arctic, with large migrations between summer and wintering grounds. 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. Mitigations described in the original EIS for other marine mammals apply to the Bowhead whale as well, and so the potential environmental effects from the Project are not likely to result in significant adverse effects

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

Species		Status / Designation[1]				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA[2]	SARA	COSEWIC	IUCN	
Atlantic Walrus	*Odobenus rosmarus*			SC	V	Central/Low Arctic (COSEWIC); Global (IUCN; *Odobenus rosmarus*)
Beluga Whale	*Delphinapterus leucas*		E	E	LC	St. Lawrence Estuary (COSEWIC/SARA); Global (IUCN)
Blue Whale	*Balaenoptera musculus*		E	E	E	Atlantic (COSEWIC/SARA); Global (IUCN)
Bowhead Whale	*Balaena mysticetus*			SC	LC	Eastern Canada-West Greenland (COSEWIC); Global (IUCN)
Fin Whale	*Balaenoptera physalus*		SC	SC	V	Atlantic (COSEWIC/SARA); Global (IUCN)
Harbour Porpoise	*Phocoena*			SC	LC	Northwest Atlantic (COSEWIC); Global (IUCN)
Killer Whale	*Orcinus orca*			SC	DD	Northwest Atlantic / Eastern Arctic (COSEWIC); Global (IUCN)
Leatherback Sea Turtle	*Dermochelys coriacea*		E	E	V	Atlantic (COSEWIC/SARA); Global (IUCN)

Species		Status / Designation[1]				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA[2]	SARA	COSEWIC	IUCN	
Loggerhead Sea Turtle	*Caretta*		E	E	V	Global (IUCN)
North Atlantic Right Whale	*Eubalaena glacialis*		E	E	CE	Global (IUCN)
Northern Bottlenose Whale	*Hyperoodon ampullatus*			SC		Davis Strait-Baffin Bay-Labrador Sea (COSEWIC)
			E	E		Scotian Shelf (COSEWIC/SARA)
					NT	Global (IUCN)
Sowerby's Beaked Whale	*Mesoplodon bidens*		SC	SC	LC	Global (IUCN)

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

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

Grey cells represent changes to status or addition of species listing from the original EIS.

Sources: COSEWIC 2009

3.1.3.1 Recovery Strategies and Plans

Since the original EAs, action plans and recovery strategies have been released for several species of marine mammals and sea turtles within the Project Areas. No critical habitats have yet been identified for these species. Important areas have been identified for Blue Whale and Leatherback Sea Turtle and may be used to inform delineation of future critical habitats (DFO 2020b, 2020c, 2020d, 2021). Leatherback Sea Turtle important areas within Atlantic Canada are near the southeastern Gulf of St. Lawrence and Waters off eastern Cape Breton Island, and waters south and east of the Burin Peninsula, NL and do not overlap with the Project Areas (DFO 2012, 2020e). Blue Whale important areas along the continental shelf edge are within the GGEG Program Project Areas but do not overlap with ELs (DFO 2018). In review of the action plans (North Atlantic Right Whale, Blue Whale, and Leatherback Sea Turtle) and recovery strategy (Loggerhead Sea Turtle) and important areas, no new or modified mitigation measures are required beyond those already identified in the Exploration Drilling Project and GGEG Program EAs.

3.2 Special Areas

Various changes have been made to special areas since the most recent approved EA document for each project. Details on special areas were most recently described in:

- Exploration Drilling Project EIS (ExxonMobil Canada Ltd 2017): Section 6.3.7
- Exploration Drilling Project EIS Addendum (ExxonMobil Canada Ltd 2018c): Section 4.2.4
- GGEG Programs EA Update (ExxonMobil Canada Ltd 2019): Section 3.1.4.1

3.2.1 Marine Refuges

Marine refuges are designated under the *Fisheries Act* to protect portions of sensitive and productive marine habitat from fishing activities. Currently, there is one marine refuge within the EA project areas (Figure 3-2). Oil and gas exploration activities are not prohibited in Marine Refuges. This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.2 NAFO Coral and Sponge Fisheries Closure Areas

NAFO has established various coral and sponge Fisheries Closure Areas (FCAs) within Vulnerable Marine Ecosystems (VMEs) to help conserve ocean species, habitats and biodiversity from the effects of bottom fishing as well as for research purposes. There are currently eight FCAs within the Exploration Drilling Project Area and ten FCAs within the GGEG Program Project Area (Figure 3-3). Oil and gas exploration activities are not prohibited in FCAs. This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.3 Species at Risk Critical Habitat

Due to declines in abundance and biomass, northern and spotted wolffish have been listed as “Threatened” under SARA. New critical habitat for spotted and northern wolffish was set out in the proposed 2020 Recovery Strategy (DFO 2020a) for these species, primarily along the edge of the Grand Banks and Labrador Shelf (see Section 3.1.1.1). The project areas intersect with portions of these critical habitats (Figure 3-1, Figure 3-2). Section 58 of SARA prohibits destruction of any part of identified critical habitat necessary for the survival or recovery of a listed wildlife species identified in the recovery strategy or action plan (DFO 2020a). Any oil and gas activity that has the potential to affect a species at risk as prohibited by SARA requires a review by DFO. This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.4 Snow Crab Stewardship Exclusion Zones

Snow crab fishing is prohibited in exclusion zones, which are 0.5 or 1.0 nautical mile-wide corridors along the length of crab fishing area boundaries to delineate fishing areas and provide a refuge area for snow crab within NAFO 3LNO. Currently, one Snow Crab Stewardship Exclusion Zones is located in the Project Areas (Figure 3-2). Oil and gas exploration activities are not prohibited in snow crab stewardship exclusion zones. This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.5 UN Convention on Biological Diversity Ecologically and Biologically Significant Areas

In 1992 Canada ratified the United Nations Convention on Biological Diversity, which came into effect in December 1993. The Convention is an important step towards conservation of global biodiversity and identified Ecologically and Biologically Significant Areas (EBSAs) include ocean habitat areas off eastern Newfoundland and Labrador. The Exploration Drilling Project Area overlaps with two UN Convention EBSAs, whereas the GGEG Program Project Area intersects with four (Figure 3-2). This category of special area was described in the original EAs and mitigations described in the original EAs

apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.6 Ecologically and Biologically Significant Areas

A number of EBSAs have been identified in marine areas of Eastern Newfoundland. There is currently one EBSA within the Exploration Drilling Project Area (Northeast Slope) and four EBSAs in the GGEG Program Project Area (Northeast Slope, Orphan Spur, Lilly Canyon-Carson Canyon, Southeast Shoal) (Figure 3-2). This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.7 Vulnerable Marine Ecosystems

The Food and Agriculture Organization of the United Nations (FAO) identifies VMEs as benthic environments sensitive to disturbance and slow to recover. Portions of VMEs may be closed to bottom fishing activities (See NAFO fisheries closure areas in Figure 3-3). VME areas (i.e., areas identified for sponges, sea pens and large gorgonian corals) in the Newfoundland offshore have been updated. There are currently 15 VMEs within the Exploration Drilling Project Area for large gorgonian corals (3), sponges (8), and sea pens (4) (Figure 3-3). Within the GGEG Program Project Area there are 18 VMEs for large gorgonian corals (5), sponges (8), and sea pens (5). Oil and gas exploration activities are not prohibited in VMEs (Figure 3-3). This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

3.2.8 Significant Benthic Areas

DFO has defined four types of Significant Benthic Areas (SiBAs) 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. Within the Exploration Drilling Project Area there are currently three SiBAs for sea pens (1), large gorgonian corals (1), and small gorgonian corals (1) (Figure 3-3). Within the GGEG Project Area there are currently four SiBAs for sponges (1), sea pens (1), large gorgonian corals (1), and small gorgonian corals (1) (Figure 3-3). This category of special area was described in the original EAs and mitigations described in the original EAs apply to changed special areas as well, and so Project activities are not likely to result in significant adverse effects.

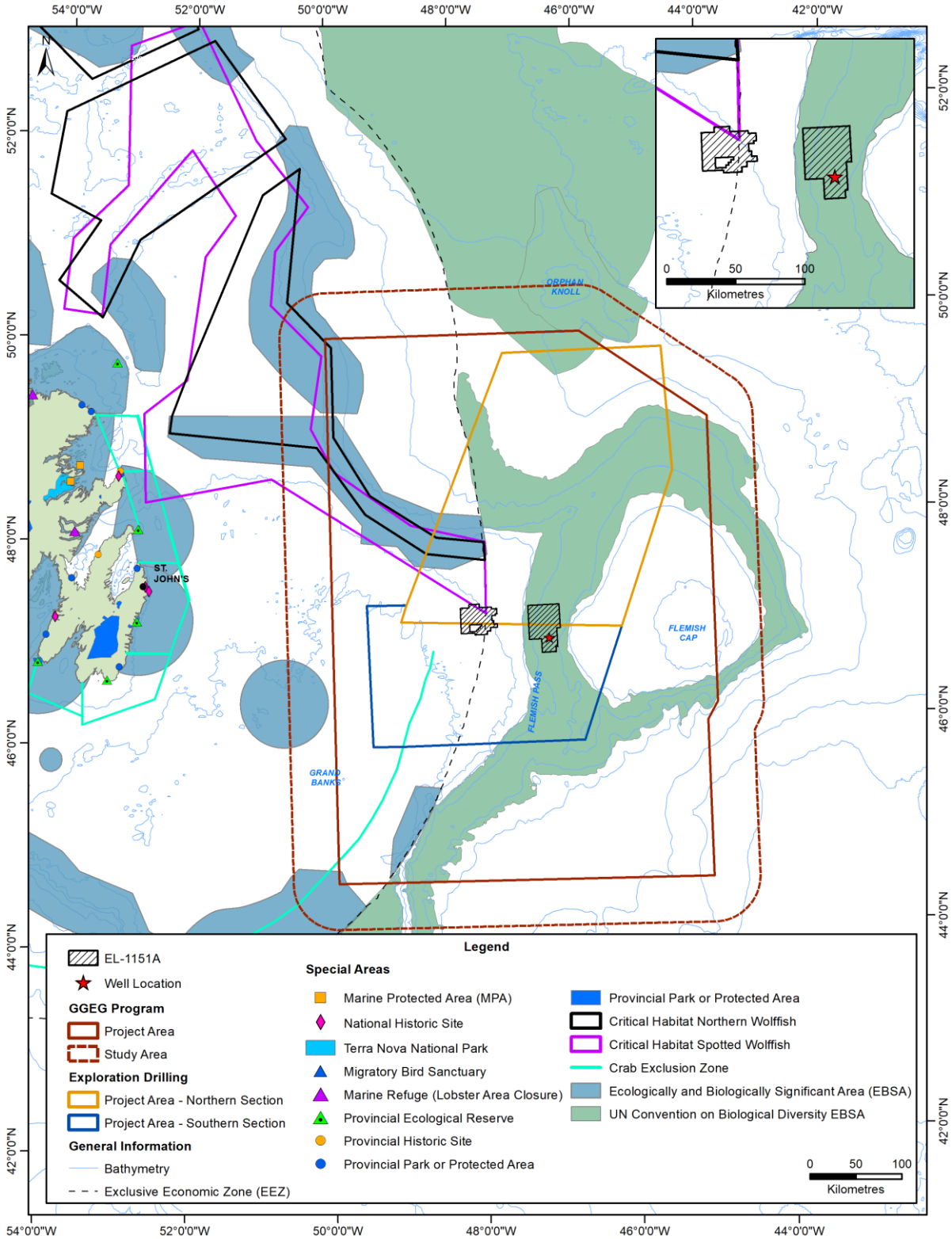

Figure 3-2: Protected Areas, Refuges, Critical Habitat and EBSA Special Areas within the Project Areas.

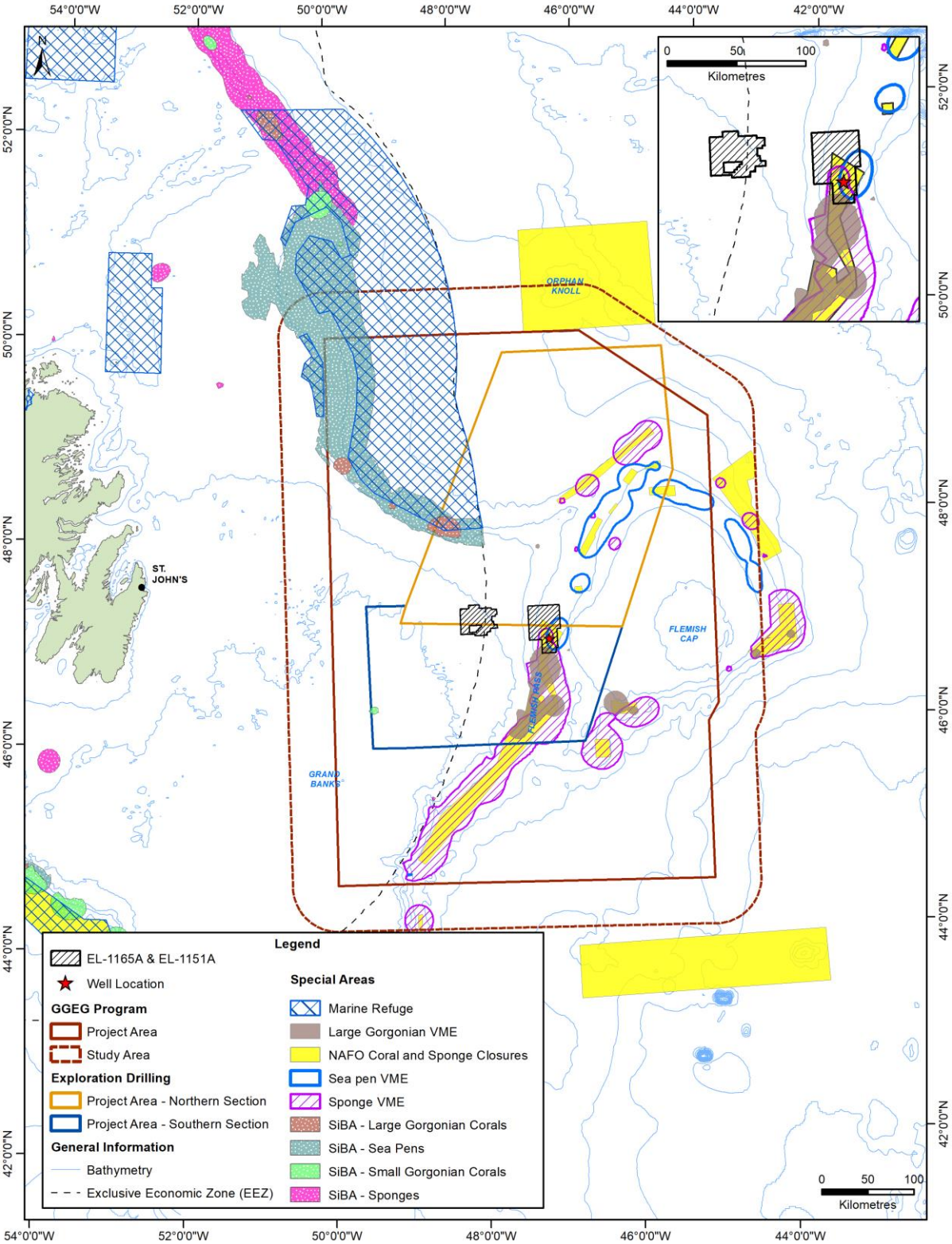

Figure 3-3: Marine Refuges, Coral and Sponge Closures, Vulnerable Marine Ecosystems, and Significant Benthic Areas within the Project Areas.

3.3 Commercial Fisheries

Based on available datasets (2016-2020), commercial fisheries activity in the Project Area is similar to datasets presented in the Exploration Drilling Project and GGEG Program EAs. Figure 3-4 to Figure 3-12 provide updated geographic distribution of domestic commercial fishing activity within and adjacent to the Project Area. The information provided in these maps is based on the geospatial data received from DFO. They show 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. The information represents the fishing intensity for all years from 2016 to 2020, aggregated for all species. The data is quantified using Jenk's (Natural Breaks) classification, where each grid square represents the number of fishing records for the location, the resulting heat map indicates areas of greatest activity.

Fishing activity from 2016-2020 is similar to what was assessed in the Exploration Drilling Project (2011-2016 dataset) and GGEG Program (2009-2015 dataset) EAs with relatively lower fishing effort in the deeper Flemish Pass waters of EL 1165A and higher effort on the continental shelf (Figure 3-4 to Figure 3-12) With implementation of mitigation measures, the overall magnitude of the effect of exploration drilling and seabed surveys on Commercial Fisheries remains low. ExxonMobil will continue to engage with commercial fishers (see Section 2.3) to coordinate 2022 Project Activities and minimize potential effects.

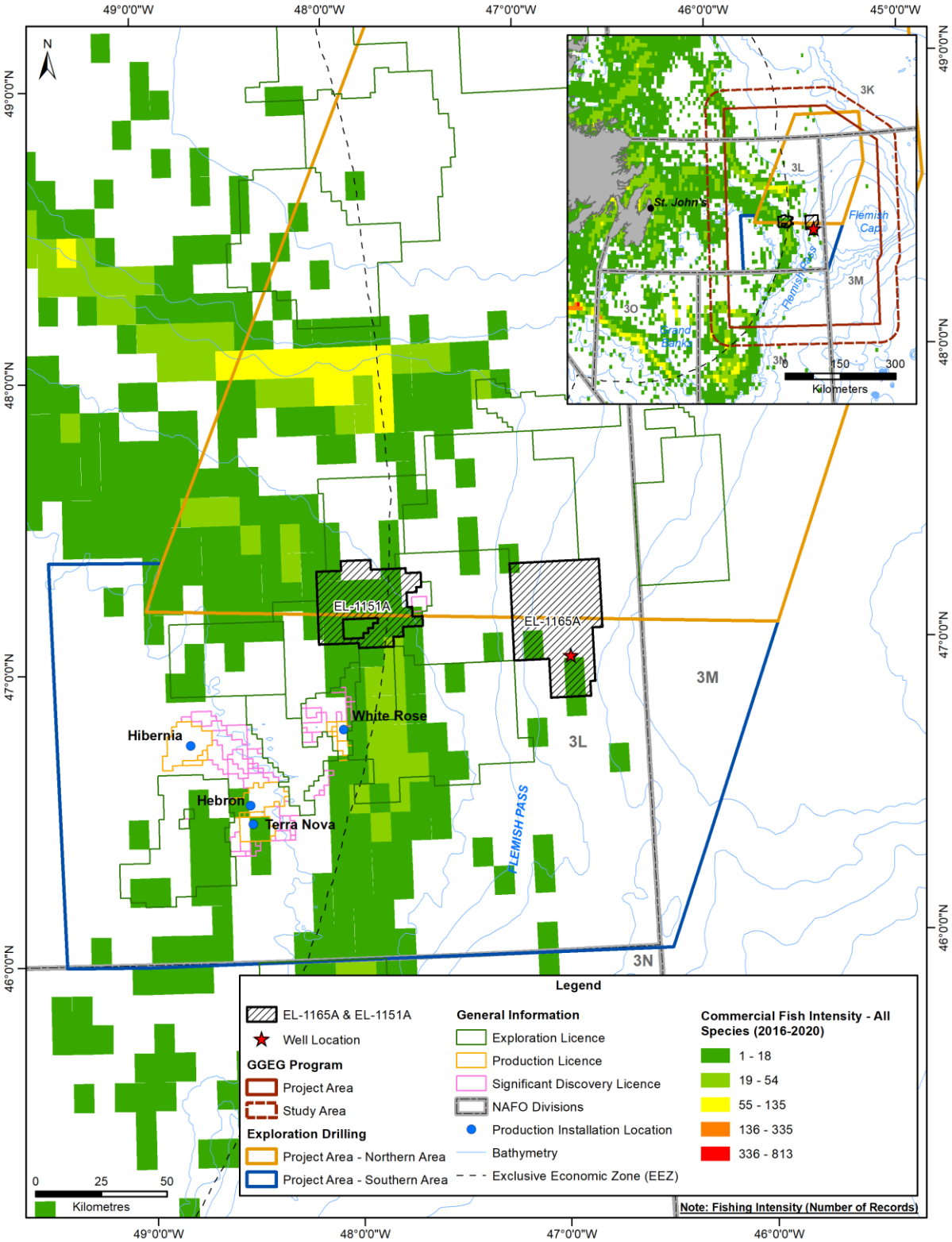

Figure 3-4: Commercial Fishing Intensity; All Species (2016-2020).

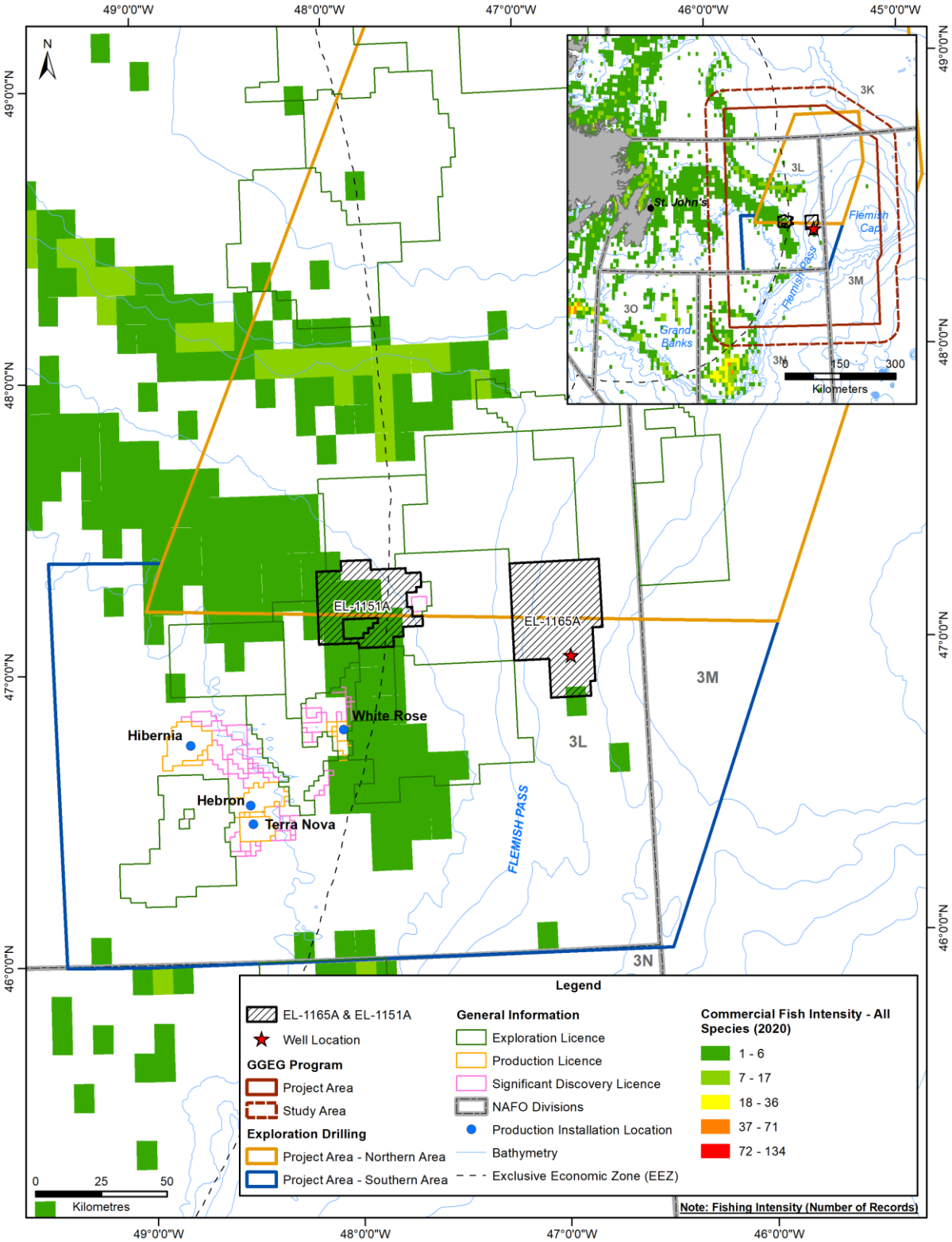

Figure 3-5: Commercial Fishing Intensity; All Species (2020).

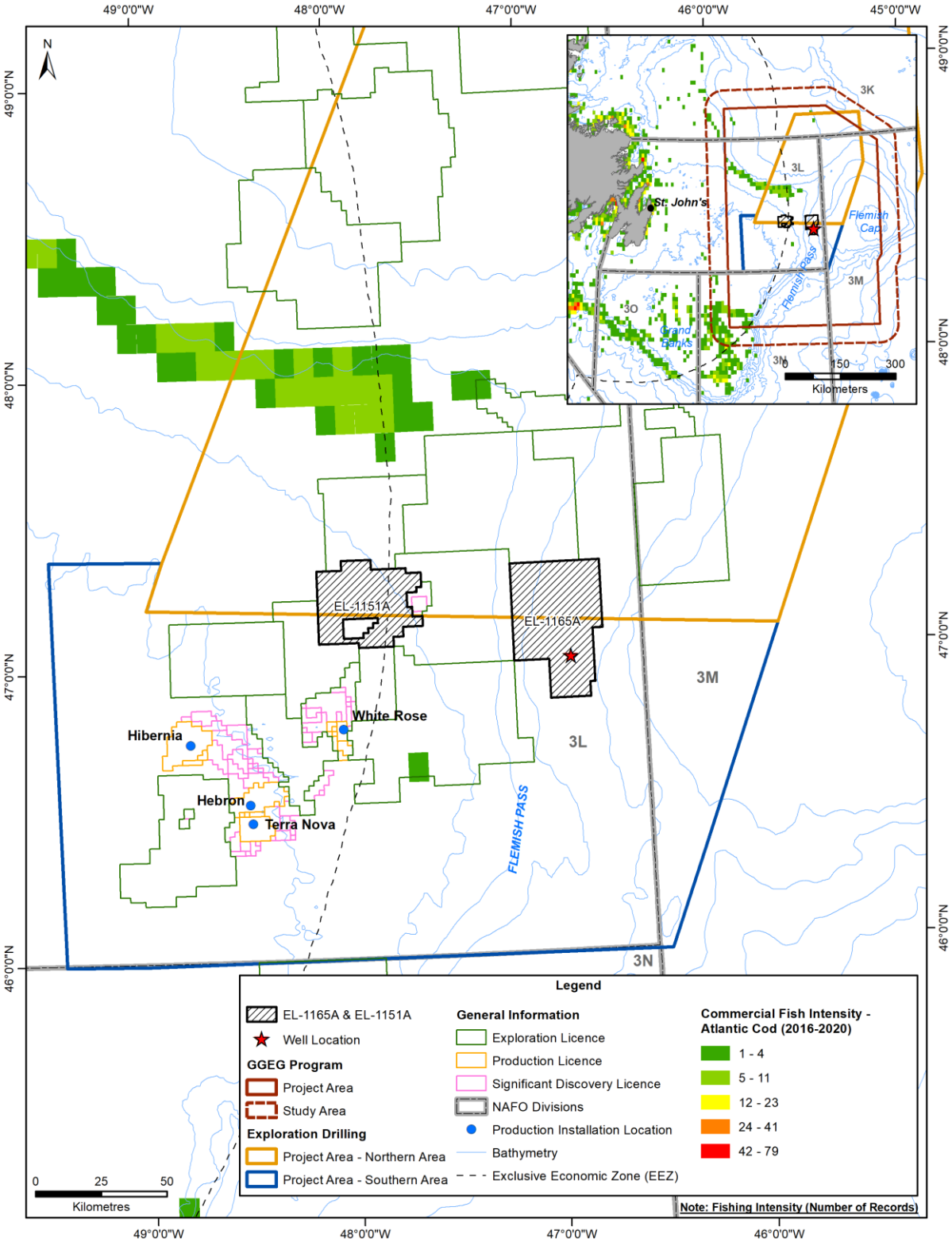

Figure 3-6: Commercial Fishing Intensity; Atlantic Cod (2016-2020).

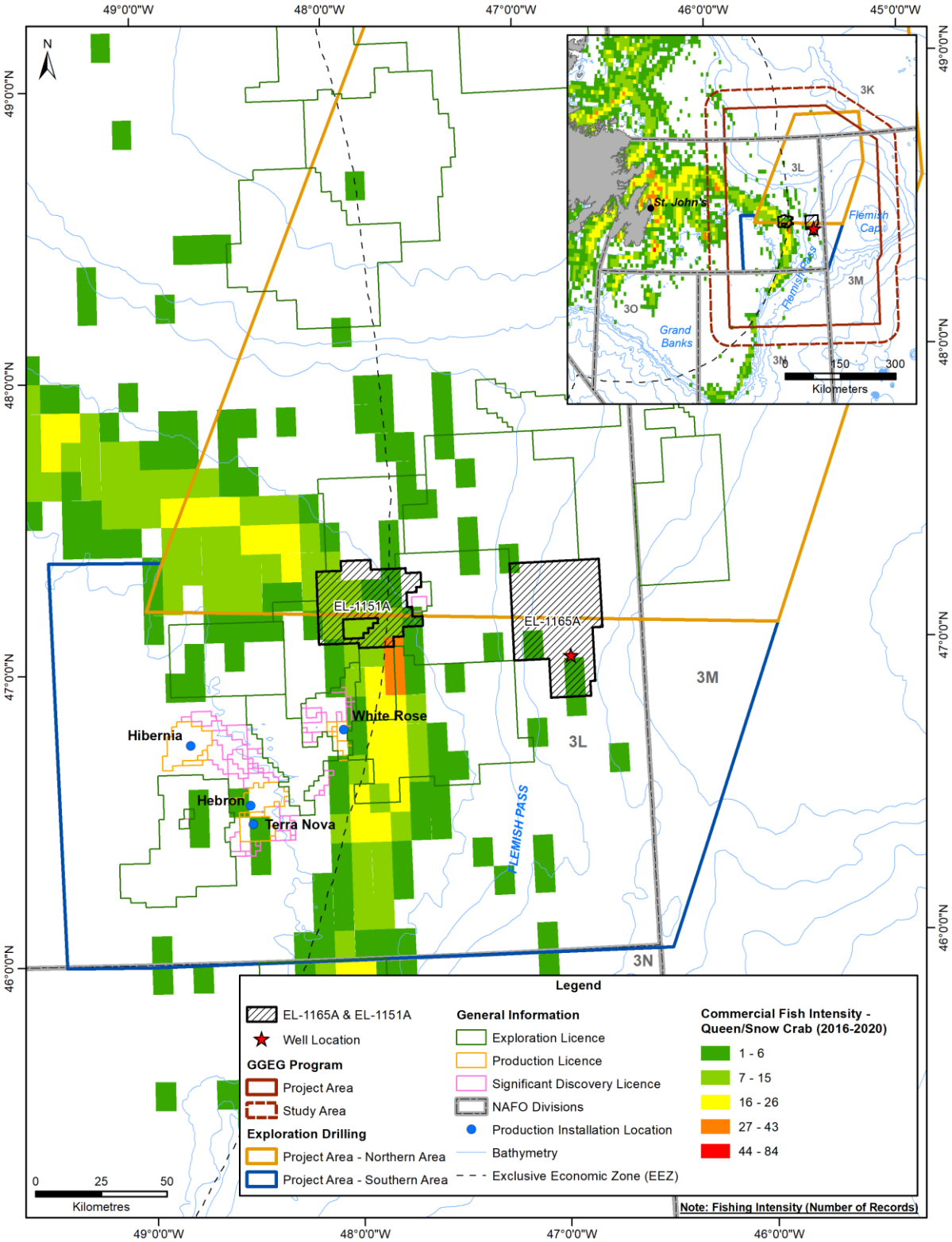

Figure 3-7: Commercial Fishing Intensity; Queen/Snow Crab (2016-2020).

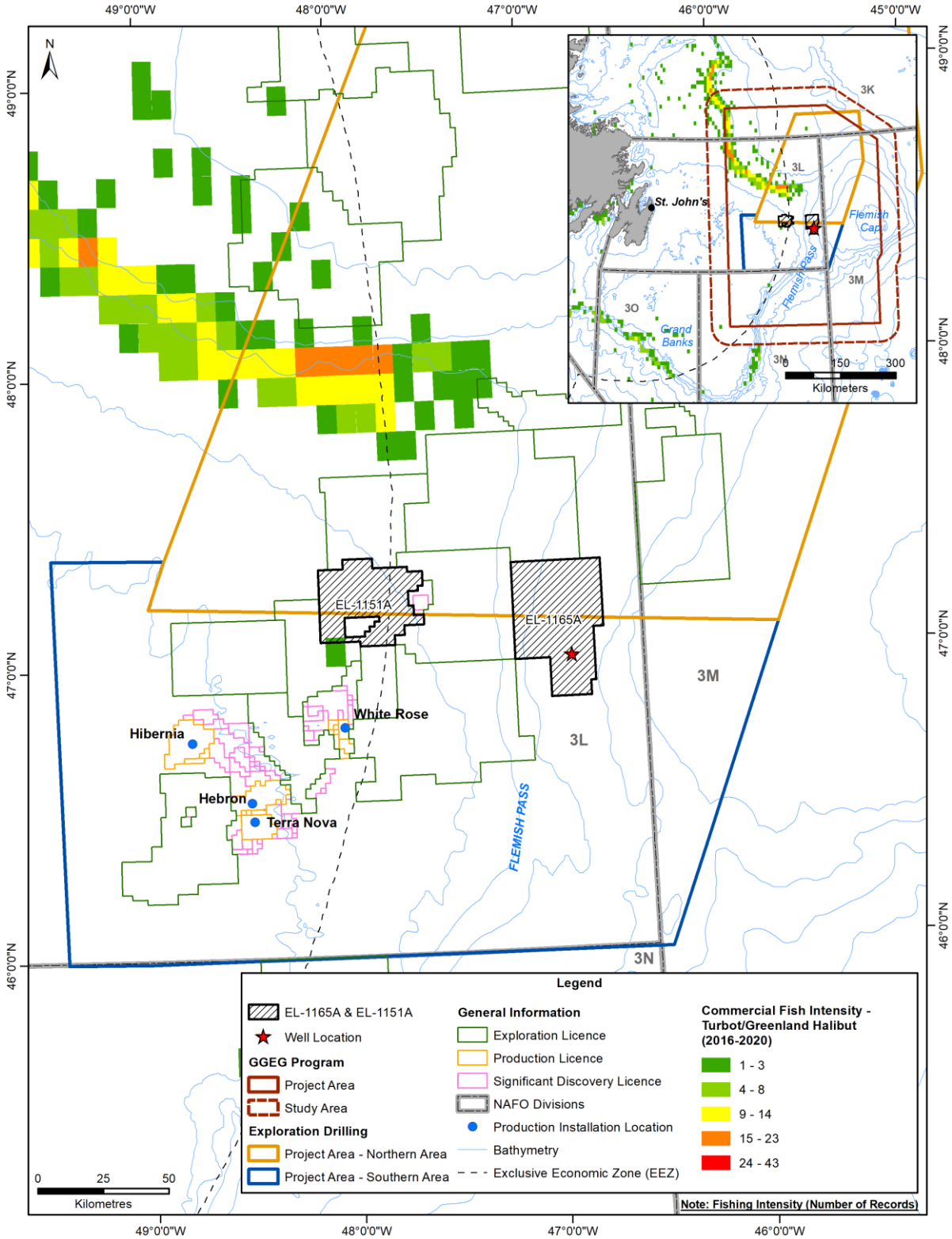

Figure 3-8: Commercial Fishing Intensity; Turbot/Greenland halibut (2016-2020).

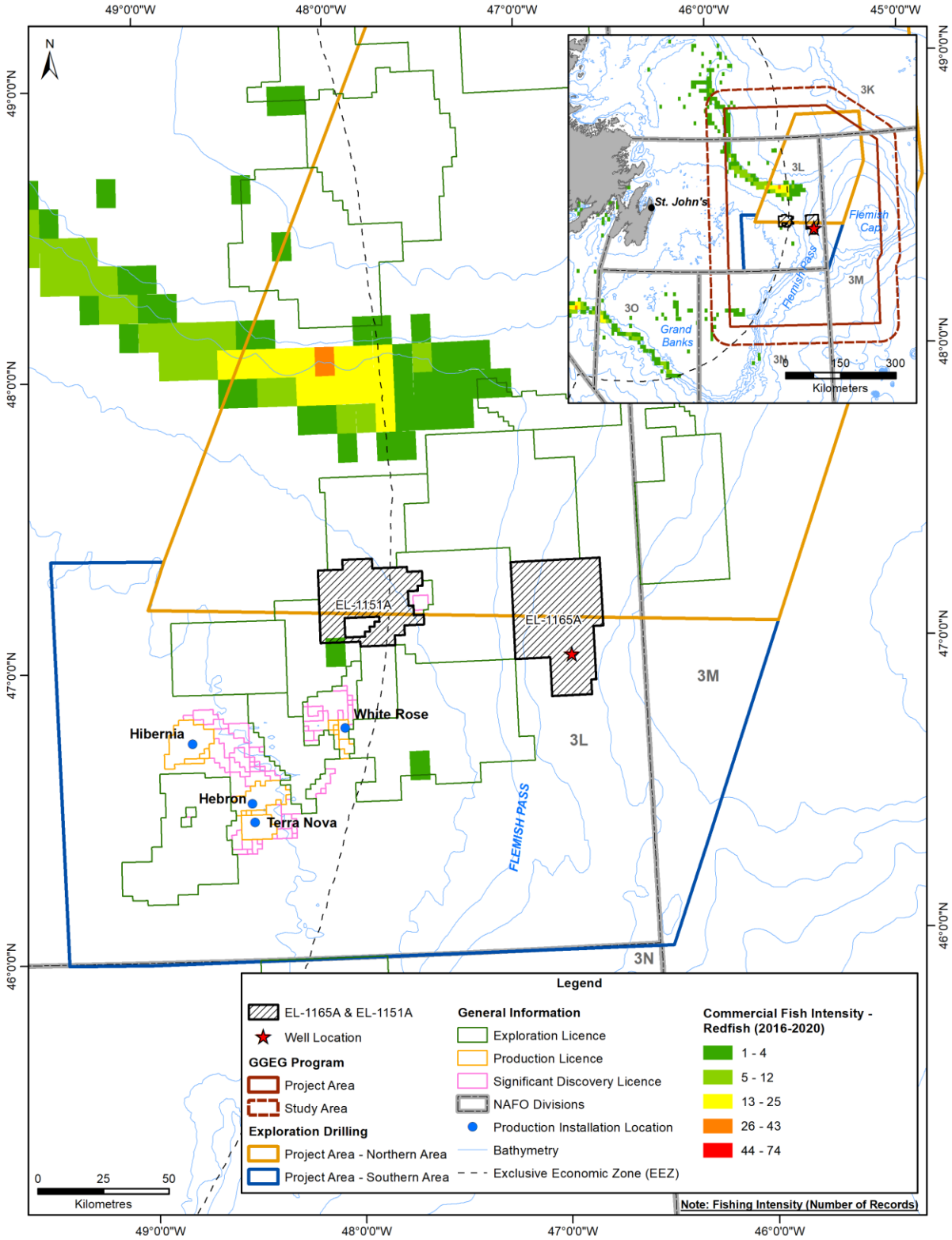

Figure 3-9: Commercial Fishing Intensity; Redfish (2016-2020).

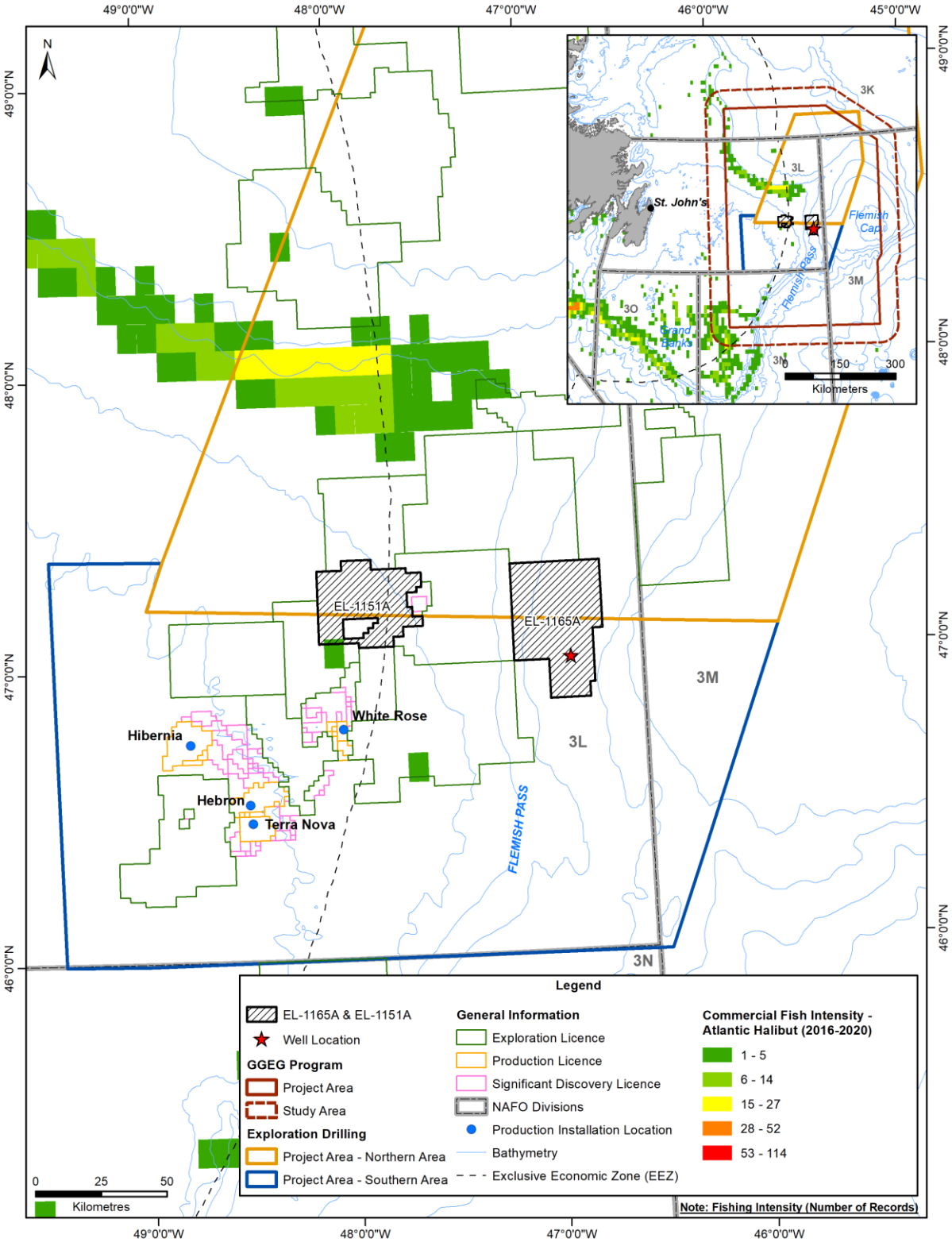

Figure 3-10: Commercial Fishing Intensity; Atlantic Halibut (2016-2020).

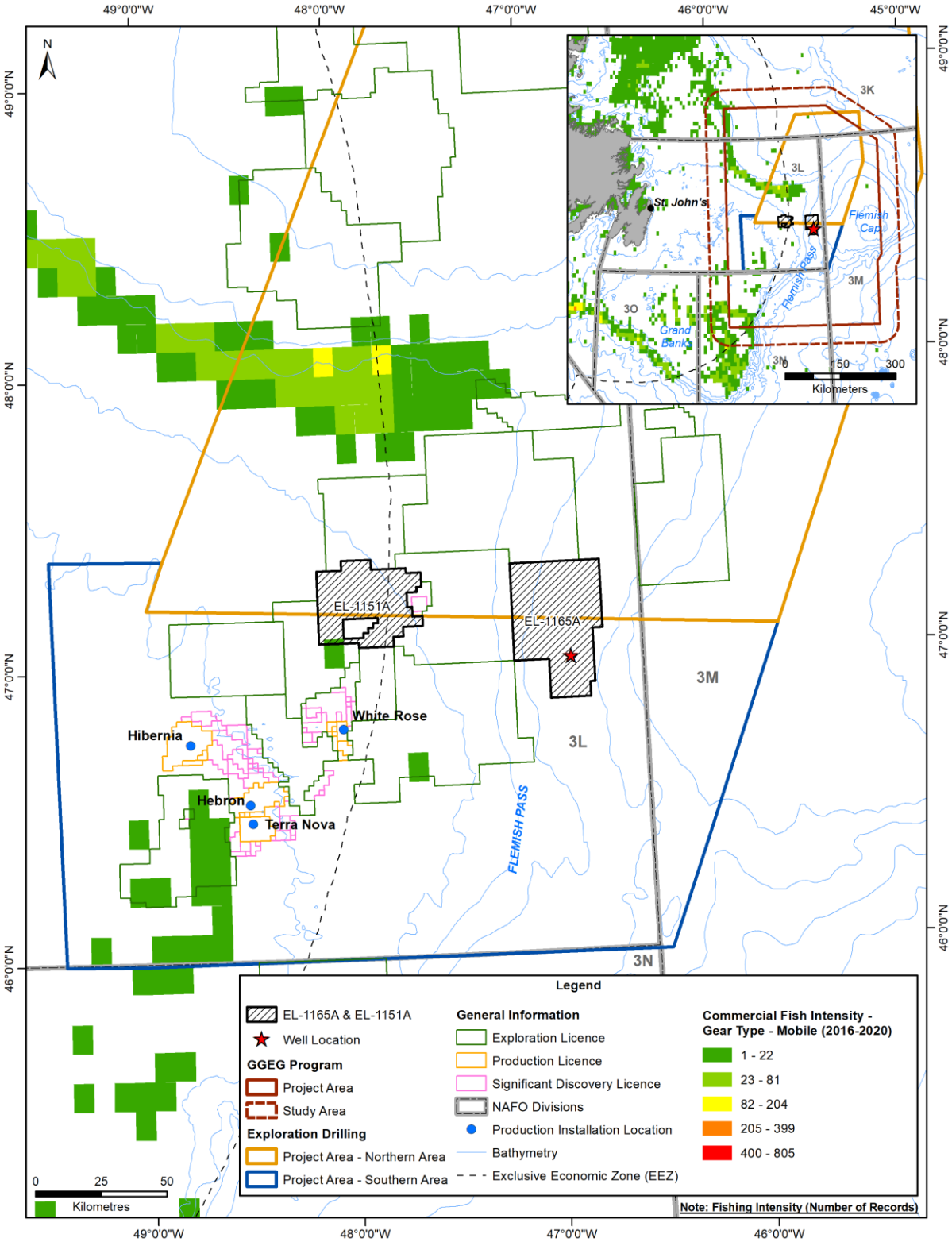

Figure 3-11: Commercial Fishing Locations; Mobile Gear Types (2016-2020).

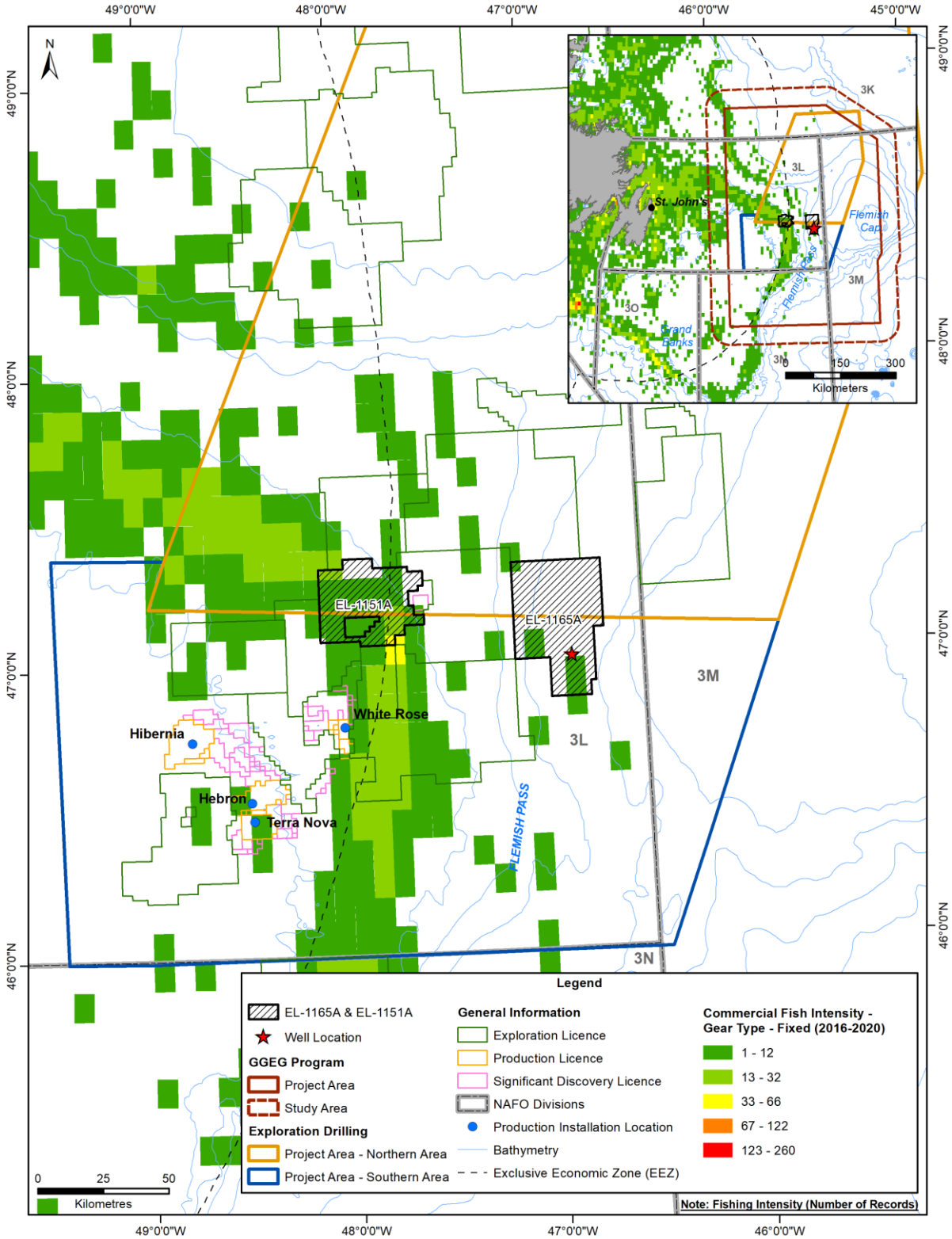

Figure 3-12: Commercial Fishing Locations; Fixed Gear Types (2016-2020).

4 ACCIDENTAL EVENTS

4.1 EL 1165A Update to Worst-Case Unmitigated Hydrocarbon Release Scenario

The worst-case discharge rate for the planned Hampden K-41 well for an unmitigated hydrocarbon release has been updated and was provided to the C-NLOPB and the Impact Assessment Agency of Canada for review in February 2022. Without any pipe in the hole, the discharge rate has increased from 37,800 bbls/day to 44,600 bbls/day based on updated calculations due to a change in the reservoir target (deeper location). This results in a revised reservoir pressure estimate, in addition to reservoir property updates (i.e., increased permeability). In the EIS Addendum (ExxonMobil 2018), the model and assessment were based on the 37,800 bbls/day value. The worst-case discharge rate that was used in the spill modelling on EL 1165A was 37,800 bbls/day and on EL 1165B (formerly EL 1135) was 156,000 bbls/day, so the worst-case discharge volume increase is within the range of volumes that has been modelled previously.

The implications of a larger hypothetical release rate in terms of the potential to impact the trajectory, fate, or potential for effects based on what was previously modelled was evaluated by RPS in initial spill modelling. It was concluded that a higher release rate from 37,800 bbls/day to 44,600 bbls/day would potentially result in:

- Smaller oil droplet size distribution (smaller droplets in the water column);
- Longer oil droplet entrainment in the water column (on average, additional 21 minutes in the water column);
- Increased level of dissolution, degradation, and movement by subsurface currents; and
- Increased oil transport (<6km) based upon additional time in the water column and current speeds.

The predicted environmental effects of potential accidental events including a subsurface blowout was detailed in Section 15.0 of the EIS (ExxonMobil 2017) and summarized in Section 7.0 of the EIS Addendum (ExxonMobil 2018). The potential effects of the updated worst-case discharge rate was assessed for each of the VCs evaluated in the EIS and EIS Addendum: Fish and Fish Habitat, Marine and Migratory Birds, Marine Mammals and Sea Turtles, Special Areas, Indigenous Communities and Activities, and Commercial Fisheries and Other Ocean Users.

4.1.1 Marine Fish and Fish Habitat

The EIS Addendum summarized the effects of accidental events on Marine Fish and Fish Habitat as it relates to effects in the water column as follows (EIS Addendum Section 7.2.1):

> *"The results of a hypothetical, unmitigated subsurface blowout modelled in the Project Area may result in reaching or exceeding the ecological threshold for in-water concentration (1 µg/L PAH or 100 µg/L THC) for areas of the Flemish Cap, Flemish Pass, Grand Bank and mid-Atlantic."*
>
> *"Adult demersal and pelagic fish could potentially avoid the spill areas, but the juvenile and the early life stages of fish and benthic invertebrates in the immediate areas of the spill would likely result in sublethal and lethal effects. Fish presence and abundance would also be affected by this unmitigated scenario as mobile fish species would temporarily avoid the spill footprint within*

the model results. Local reductions in plankton due to injury or mortality from hydrocarbon exposure may also reduce foraging opportunities for fish."

Changes to the geographic extent (<6 km increase) and duration (<1 hr increase) based on a 44,600 bbls/day worst case unmitigated spill scenario would be within the spatial and temporal resolution of the original assessment. Therefore, the modification is within the predicted environmental effects of a subsurface blowout from the EL1165A site on Marine Fish and Fish Habitat. In consideration of spill prevention techniques and response strategies, residual effects on Marine Fish and Fish Habitat would not change from what was originally predicted: adverse, medium in magnitude, medium to long-term in duration, occur within the Regional Study Area (RSA), and reversible. Therefore, the modifications to the discharge rate does not change or modify any of the existing conclusions in the EIS regarding the effects on Fish and Fish Habitat.

4.1.2 Marine and Migratory Birds

The EIS Addendum summarized the effects of accidental events on Marine and Migratory Birds as it relates to effects in the water column as follows (EIS Addendum Section 7.2.2):

"Murres and dovekies, which spend most of their time sitting on the water's surface, are most vulnerable (estimated 95 percent mortality), while species that dive or feed at the water's surface for their prey but otherwise spend little time on the water, including Leach's storm-petrels, great shearwaters, and great skuas, are predicted to have a lower mortality rate of 35 percent."

"The degree of exposure and type of effects would depend on the type and size of spill, time of year, and location and species of Marine and Migratory Birds within the affected area."

Changes to the geographic extent (<6 km increase) and duration (<1 hr increase) based on a 44,600 bbls/day worst case unmitigated spill scenario would be within the spatial and temporal resolution of the original assessment. Therefore, the modification is within the predicted environmental effects of a subsurface blowout from the EL1165A site on Marine and Migratory Birds. In consideration of spill prevention techniques and response strategies, residual effects on Marine and Migratory Birds would not change from what was originally predicted: adverse, medium to high in magnitude, medium to long-term in duration, occur within the RSA, and reversible. Therefore, the modifications to the discharge rate do not change or modify any of the existing conclusions in the EIS regarding the effects on Marine and Migratory Birds.

4.1.3 Marine Mammals and Sea Turtles

The EIS Addendum summarized the effects of accidental events on Marine Mammals and Sea Turtles as is relates to effects in the water column as follows (EIS Addendum Section 7.2.3):

"Potential for change in habitat quality or use of oceanic habitats (i.e., water quality and air quality at the air-sea interface) will be greater near the location of the sub-surface release. The degree of change in mortality or injury and change in health will depend in large part on the occurrence and distribution of marine mammals and sea turtles at the time of the blowout, as well as the duration and extent of oil release (i.e., potential severity of effects will be dependent on the potential for exposure). Depending on the exact nature, extent, and duration of a spill, marine mammals and sea turtles in the spill area are likely to experience a combination of exposures from contaminated air, water, and sediment and via a combination of pathways (inhalation, ingestion, aspiration, and adsorption). Oceanic animals that are closer to the site of

the blowout are more likely to be exposed to a more constant flow and higher concentrations of fresher oil, as compared to nearshore species."

Changes to the geographic extent (<6 km increase) and duration (<1 hr increase) based on a 44,600 bbls/day worst case unmitigated spill scenario would be within the spatial and temporal resolution of the original assessment. Therefore, the modification is within the predicted environmental effects of a subsurface blowout from the EL1165A site on Marine Mammals and Sea Turtles. In consideration of spill prevention techniques and response strategies, residual effects on Marine Mammals and Sea Turtles would not change from what was originally predicted: adverse, low to medium in magnitude, medium to long-term in duration, occur within the RSA, and reversible. Therefore, the modifications to the discharge rate does not change or modify any of the existing conclusions in the EIS regarding the effects on Marine Mammals and Sea Turtles.

4.1.4 Special Areas

The original EIS Addendum assessed the Special Areas that were likely to be affected by a subsurface blowout (that is within the footprint or adjacent). Those areas (listed in EIS Addendum Section 7.2.4), including FCAs, VMEs, preliminary representative marine areas (PRMA), crab stewardship areas, and EBSAs, would remain the same with the updated worst-case unmitigated spill scenario and would therefore not change from what was originally assessed. In consideration of spill prevention techniques and response strategies, residual effects on Special Areas would not change from what was originally predicted: adverse, medium in magnitude, medium to long-term in duration, occur within the RSA, and reversible. Therefore, the modifications to the discharge rate does not change or modify any of the conclusions in the EIS regarding the effects on Special Areas.

4.1.5 Indigenous Communities and Activities

The EIS Addendum summarized the effects of accidental events on Indigenous Communities and Activities as follows (EIS Addendum Section 7.2.5):

"In the extremely unlikely event that a blowout occurs, the (conservative, without mitigation) oil spill modelling predicts a low potential of oil making contact with the shoreline areas of Newfoundland and Labrador, and Sable Island and the eastern shores of Nova Scotia (depending on the time of the spill) and thus, potentially coming into direct contact with Indigenous communities or activities. Given the time to shore, any oil that did make contact with the shoreline is expected to be highly weathered, patchy and discontinuous. There will be little or no potential for such biophysical effects on marine-associated resources to translate into any decrease in the overall nature, intensity, distribution, quality or cultural value of these traditional activities by Indigenous communities."

Changes to the geographic extent (<6 km increase) and duration (<1 hr increase) based on a 44,600 bbls/day worst case unmitigated spill scenario would be within the spatial and temporal resolution of the original assessment. Therefore, the modification is within the predicted environmental effects of a subsurface blowout from the EL1165A site on Indigenous Communities and Activities. In consideration of spill prevention techniques and response strategies, residual effects on Indigenous Communities and Activities would not change from what was originally predicted: adverse, negligible to low in magnitude, medium to long-term in duration, occur within the RSA, and reversible. Therefore, the modifications to the discharge rate does not change or modify any of the conclusions in the EIS regarding the effects on Indigenous Communities and Activities.

4.2 Potential Mitigations

An overview of ExxonMobil's systems for spill prevention, well control, contingency planning and emergency response is detailed in the Exploration Drilling EIS, Section 15.1. As with the predicted worst-case scenario (37,800 bbls/day) assessed in the EIS Addendum, a subsurface blowout at a higher estimated release rate of 44,600 bbls/day would be treated similarly, as a Tier 3 Spill. A Tier 3 Spill has the potential to affect ExxonMobil business operations and may require considerable corporate and contract resources drawn from local, regional, and international sources, and mutual aid agreements may be activated. The Operator's global response team would be activated. ExxonMobil's response will be tailored to the actual spill and as outlined in EIS Section 15.1.2.2, which includes the following:

- Incident Command System
- Response Contractors and Agencies
- Spill Response Tactics and Spill Impact Mitigation Assessment
- Chemical Dispersion
- Shoreline Protection and Clean Up
- Oiled Wildlife Response
- Remediation; and
- Financials

The mitigations as described in the EIS and EIS Addendum remain applicable for a subsurface blowout at the higher estimated rate. No additional mitigations would be needed.

4.3 Assessment Summary

The higher estimated release rate from 37,800 bbls/day to 44,600 bbls/day for a worst-case scenario subsurface blowout is not predicted to change residual effects on the Valued Ecosystem Components (VECs). All of the mitigation measures and commitments outlined in the EIS and addendum remain applicable and will continue to be implemented and adhered to by ExxonMobil in planning and executing this Project. Therefore, the EIS and EIS Addendum and associated conclusions remain valid for subsurface blowout accidental events even with a higher estimated release rate. The determination of significance would remain the same as outlined in EIS Addendum Section 7.3, summarised as the following for each VEC:

- In consideration of the present knowledge of marine fish and fish habitat occurrence in the RSA, the result of spill modelling exercises, and planned mitigation, the predicted residual environmental effects from an accidental event scenario on Marine Fish and Fish Habitat is considered not significant.
- In consideration of the present knowledge of marine and migratory bird occurrence in the RSA, the known effects of oil spills on marine-associated avifauna, the result of spill modelling exercises, and planned mitigation, a precautionary conclusion is drawn that residual environmental effects from an accidental subsurface blowout on Marine and Migratory Birds are predicted to be significant depending on the specific occurrence and nature and degree of the event, but extremely unlikely to occur.

- In consideration of the present knowledge of marine mammal and sea turtle occurrence in the RSA, the result of spill modelling exercises, and planned mitigation, the residual environmental effects from an accidental event scenario on Marine Mammals and Sea Turtles are predicted to be not significant.
- In consideration of the present knowledge of Special Areas within the RSA, the result of spill modelling exercises, and planned mitigation, the predicted residual environmental effects from an accidental event scenario on Special Areas is considered not significant.
- In consideration of the location and extent of Indigenous communities and their activities within the RSA, the result of spill modelling exercises, and planned mitigation, any predicted residual environmental effects from an accidental event scenario on Indigenous communities and activities are considered not significant.
- In consideration of commercial fishing and other ocean activities within the RSA, the result of spill modelling exercises, and planned mitigation and financial compensation, the predicted residual environmental effects from an accidental event scenario on Commercial Fisheries and Other Ocean Users is considered not significant.

5 ENVIRONMENTAL EFFECTS ASSESSMENT AND SUMMARY

ExxonMobil is undertaking a marine petroleum exploration program, including exploration drilling and geophysical, geochemical, environmental and geotechnical survey activities, in the eastern portion of the Canada-Newfoundland and Labrador Offshore Area. This document comprises the 2022 EA Update for the Project.

As described in the preceding sections, the planned 2022 activities associated with the Project are in keeping with the nature and scope (project, temporal, spatial) of the Project as described, assessed and approved under the EA process for each Project. Since posting of the EAs including amendments and updates, there have been updates to key environmental components, including species of conservation concern, special areas, and commercial fisheries. The conservation status has changed for several species with additional species listings and de-listing of species. Critical habitat for spotted and northern wolffish has also been established since posting of the Exploration Drilling EIS. Regionally, there have been additional special areas including marine refuges, snow crab exclusion zones, FCAs, EBSAs, VMEs, and SiBAs. The distribution and intensity of available commercial fishing activities (2016-2020) are similar to data that was assessed for the original EAs with higher fishing effort on the continental shelf relative to the deeper waters of the Flemish Pass. Updated calculations based on target reservoir characteristics in EL 1165A indicated that the discharge rate for an unmitigated hydrocarbon release would be higher than what was assessed in the Exploration Drilling EIS. However, the estimated change to spatial extents and duration were negligible.

Overall, while there have been updates to various components, the resulting potential interactions and effects of Project activities and components as assessed in the EAs remain unchanged. The use of good planning and proven operational practices and procedures, supported by standard mitigations that are well established and outlined in relevant regulatory procedures and guidelines (as reflected in the EA submissions) remain applicable to the nature and scope of the planned 2022 Project activities. 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.

The additional information provided in this EA Update does 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 2022 Project survey activities described herein - is therefore not likely to result in significant adverse environmental effects.

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