



Jeanne D'Arc Exploration Drilling Project 2015-2025

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

2023 Environmental Assessment Update

FINAL REPORT

Submitted by:

ExxonMobil Canada Ltd.
20 Hebron Way
St. John's, Newfoundland and Labrador
Canada A1A 5G9

Prepared by:

WSP Environment & Infrastructure
36 Pippy Place, PO Box 13216
St. John's, Newfoundland and Labrador
Canada A1B 4A5

Wood TE23752002

May 17, 2023



TABLE OF CONTENTS

		Page No.
1	INTRODUCTION	1
2	PROJECT DESCRIPTION.....	2
2.1	Overview of the Original Project Description.....	3
2.1.1	Jeanne D’Arc Exploration Drilling Project.....	3
2.1.2	Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs.....	5
2.1.3	EA Commitments, Conditions, and Mitigations	7
2.2	2023 Project Activities	7
2.2.1	Drilling Operations	7
2.2.2	Follow-up Monitoring	7
2.2.3	Seabed Surveys	7
2.2.4	Supply Vessels	8
2.3	Consultations	8
3	ENVIRONMENTAL SETTING AND ASSESSMENT.....	9
3.1	Species of Conservation Concern	9
3.1.1	Jeanne D’Arc Exploration Drilling Project.....	9
3.1.1.1	Marine Fish	9
3.1.1.2	Marine and Migratory Birds	14
3.1.1.3	Marine Mammals and Sea Turtles.....	16
3.1.2	Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs.....	18
3.1.2.1	Marine Fish	19
3.1.2.2	Marine and Migratory Birds	21
3.1.2.3	Marine Mammals and Sea Turtles.....	21
3.2	Special Areas.....	21
3.2.1	Jeanne D’Arc Exploration Drilling Project.....	21
3.2.2	Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs.....	22
3.3	Commercial Fisheries.....	24
4	ACCIDENTAL EVENTS	30
4.1	EL 1167 Update to Worst-Case Unmitigated Hydrocarbon Release Scenario	30
4.2	Assessment of Adverse Environmental Effects	31
4.2.1	Marine Fish and Fish Habitat	31
4.2.2	Marine and Migratory Birds	31
4.2.3	Marine Mammals and Sea Turtles	32
4.2.4	Special Areas	32
4.2.5	Indigenous People and Community Values.....	32
4.2.6	Commercial Fisheries	33
4.2.7	Potential of Additional Mitigations	33
4.2.8	Determination of Significance	34
5	ENVIRONMENTAL EFFECTS ASSESSMENT AND SUMMARY.....	35
6	REFERENCES	36

LIST OF TABLES

	Page No.
Table 1-1	Environmental Assessment Summary 2
Table 2-1:	Engagement Activities for the 2023 Exploration Program Activities. 8
Table 3-1:	Updated Marine Fish Species at Risk or otherwise of Special Conservation Concern (Jeanne D'Arc Exploration Drilling Project) 10
Table 3-2:	Updated Marine and Migratory Bird Species at Risk or otherwise of Special Conservation Concern..... 15
Table 3-3:	Updated Marine Mammal and Sea Turtle Species at Risk or otherwise of Special Conservation Concern..... 17
Table 3-4	Updated Marine Fish Species at Risk or otherwise of Special Conservation Concern (GGEG Project) 19
Table 3-5:	Special areas added or changed since the original EA (Husky Energy 2018). 21
Table 3-6	Special areas added or changed since the most recent EA Update (EMCL 2022). 22
Table 3-7	Groundfish and Pelagic Species Caught Within the Study Areas..... 24

LIST OF FIGURES

	Page No.
Figure 2-1:	Project Area for the Jeanne D'Arc Basin Exploration Drilling Activities. 4
Figure 2-2:	Project Area for the Geophysical, Geochemical, Environmental and Geotechnical Program. 6
Figure 3-1:	Northern and Spotted Wolffish Critical Habitat (DFO 2020a). 13
Figure 3-2:	Special areas within and adjacent to both of the Study Areas..... 23
Figure 3-3:	Commercial Fishing Intensity; All Species (2017-2021). 25
Figure 3-4:	Commercial Fishing Intensity; Groundfish Species (2017-2021)..... 26
Figure 3-5:	Commercial Fishing Intensity; Pelagic Species (2017-2021)..... 27
Figure 3-6:	Commercial Fishing Locations; Mobile Gear Types (2017-2021)..... 28
Figure 3-7:	Commercial Fishing Locations; Fixed Gear Types (2017-2021)..... 29

1 INTRODUCTION

ExxonMobil Canada Ltd. (EMCL) 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, separate Environmental Assessments (EA) were filed for marine exploration and exploration drilling programs detailed in Table 1-1 and summarized below:

- The 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
- The Jeanne D’Arc Exploration Drilling Project (Husky Energy 2018) was planned, prepared, and submitted in compliance with EA requirements and regulatory agency processes of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Note that Husky was the original proponent of this project and in 2019, ExxonMobil Canada Limited acquired a portion of EL 1151 which was later merged with EL 1163 to form EL 1167 for which EMCL is the Operator.

The planned program for 2023 includes activities from both the GGEG program EA and the Exploration Drilling Environmental Impact Statement (EIS). This document will provide an update for both EAs.

This document provides an update to the Jeanne D’Arc Exploration Drilling Environmental Impact Statement (EIS) with specific details for the drilling program in EL 1167 (formerly EL 1151 and EL 1163). Additionally, this document provides an update to the Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical programs EA with specific details for the planned surveys in EL 1169.

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, this EA update provides the following information for both programs:

- An overview of the planned Project activities for the upcoming year (Section 2.2);
- 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 accidental spill event scenarios (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	Jeanne D'Arc Exploration Drilling Project 2015-2025	Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical (GGEG) Programs (2015-2024)
Environmental Assessment Documents	<ul style="list-style-type: none"> • EIS (Husky Energy 2018)* • Response to Information Requirements (Husky Energy 2019a,b,c)* • Decision Statement (IAAC 2020) 	<ul style="list-style-type: none"> • Environmental Assessment (EA) Report (ExxonMobil Canada Ltd 2015) • EA Addendum and Amendment (ExxonMobil Canada Ltd 2016) • EA Updates (ExxonMobil Canada Ltd 2018a, 2019, 2022) • Determination of Significance (C-NLOPB 2016)
Reference Number	Canadian Impact Assessment Registry (CIAR, formerly Canadian Environmental Assessment Registry (CEAR)) 80130	-
Temporal Scope	Year-round, 2015-2025 inclusive	Year-round, 2015-2024
Geographic Scope	Eastern Offshore NL (Figure 2-1)	Eastern Offshore NL (Figure 2-2)
Planned 2023 Project Activity	Licence Area: EL 1151A (part of consolidated EL 1167) <ul style="list-style-type: none"> • Drilling Operations (including site • preparation activities, environmental • monitoring, and inspections) • Supply and Servicing • Follow up monitoring 	Licence Area: EL 1169 <ul style="list-style-type: none"> • Seabed Surveys • Supply and Servicing

*Husky Energy was the original proponent for this project. EMCL is now the operator for EL 1167 (formerly EL 1151A and EL 1163).

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 2023 Project activities.

2.1 Overview of the Original Project Description

2.1.1 Jeanne D'Arc Exploration Drilling Project

The Jeanne D'Arc Exploration Drilling Project includes the planned conduct of an oil and gas exploration program offshore Eastern Newfoundland over the 2015 to 2025 period as described in the original EIS (Husky Energy 2018). 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 licence EL 1151A that is now part of consolidated area EL1167 and is currently operated by ExxonMobil. The Project Area covers an area of 19,366 km² and is illustrated in Figure 2-1. Portions of the Project Area are located within Canada's Exclusive Economic Zone (EEZ), and portions are 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 34 m to 354 m. Drilling may occur year-round with each well anticipated to take approximately 80 days to drill.

The EIS concluded (refer to Section 11.5 of the original EIS) that: *"The residual adverse environmental effects from planned routine activities associated with the Project are predicted to be not significant. Most environmental effects are predicted to be reversible, of limited duration, magnitude, and geographic extent"* (Husky Energy 2018). To minimize and reduce potential Project related effects, general and Valued Component (VC)-specific mitigation measures were proposed (refer to Table 11.2 of the original EIS). Therefore, *"With the implementation of these proposed mitigation measures, residual adverse environmental effects of routine Project activities and components are predicted to be not significant for all VCs"* (Husky Energy 2018).

Regarding accidental events (batch spills and blowouts), the EIS concluded that: *"The only potential for significant residual adverse environmental effects as a result of the Project is associated with an accidental event. Should an accidental event occur, significant adverse environmental effects have been predicted for commercial fisheries, migratory birds and Indigenous people and community values; however, the likelihood of an accidental event occurring is considered low. Husky will design the Project and conduct all activities with a focus on safety and pollution prevention"* (Husky Energy 2018).

ExxonMobil will continue to implement the mitigation measures as described in the approved Exploration Drilling EIS for 2023 Project Activities. The proposed Project is therefore not likely to result in significant adverse environmental effects.

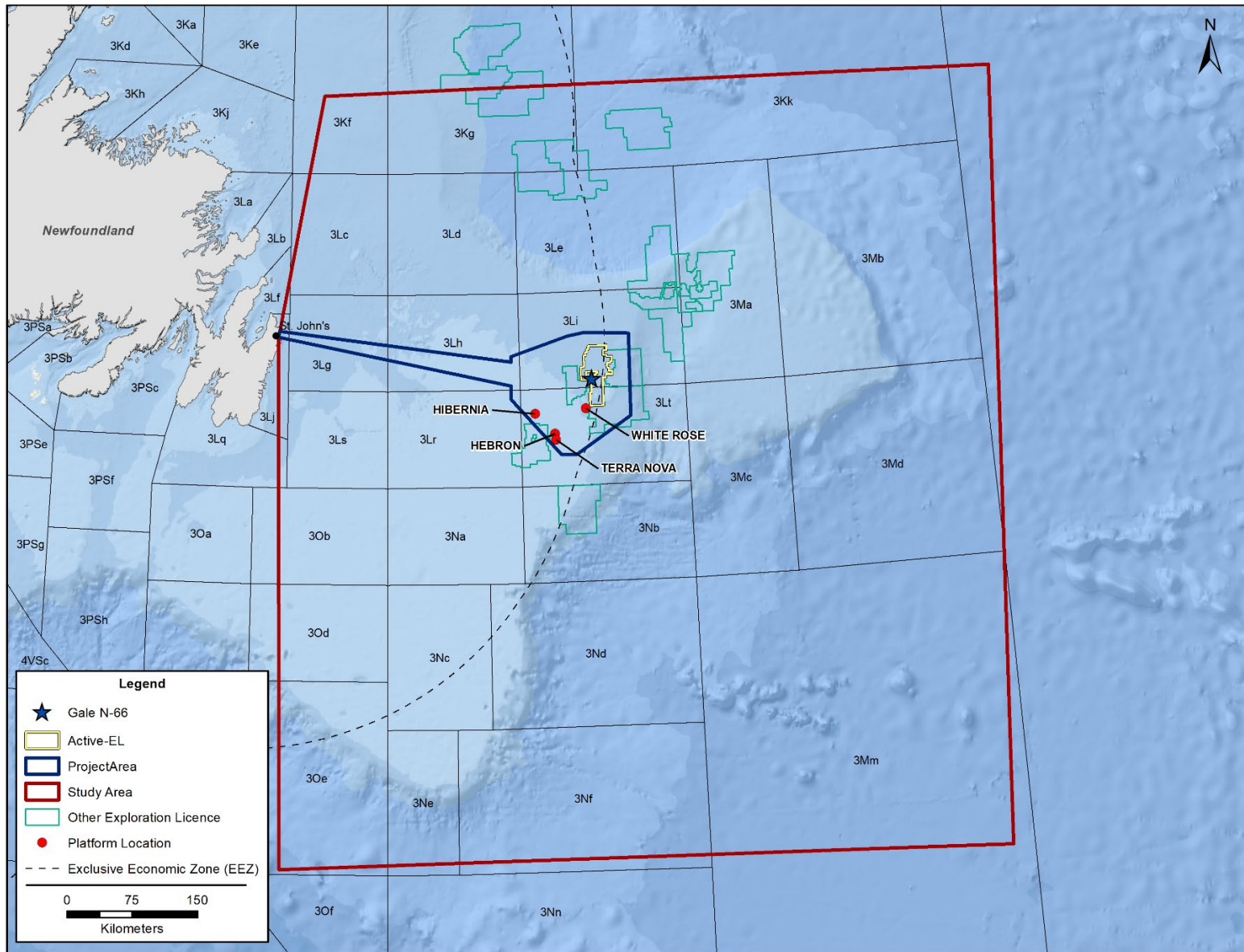


Figure 2-1: Project Area for the Jeanne D'Arc Basin Exploration Drilling Activities.

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 km², 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.

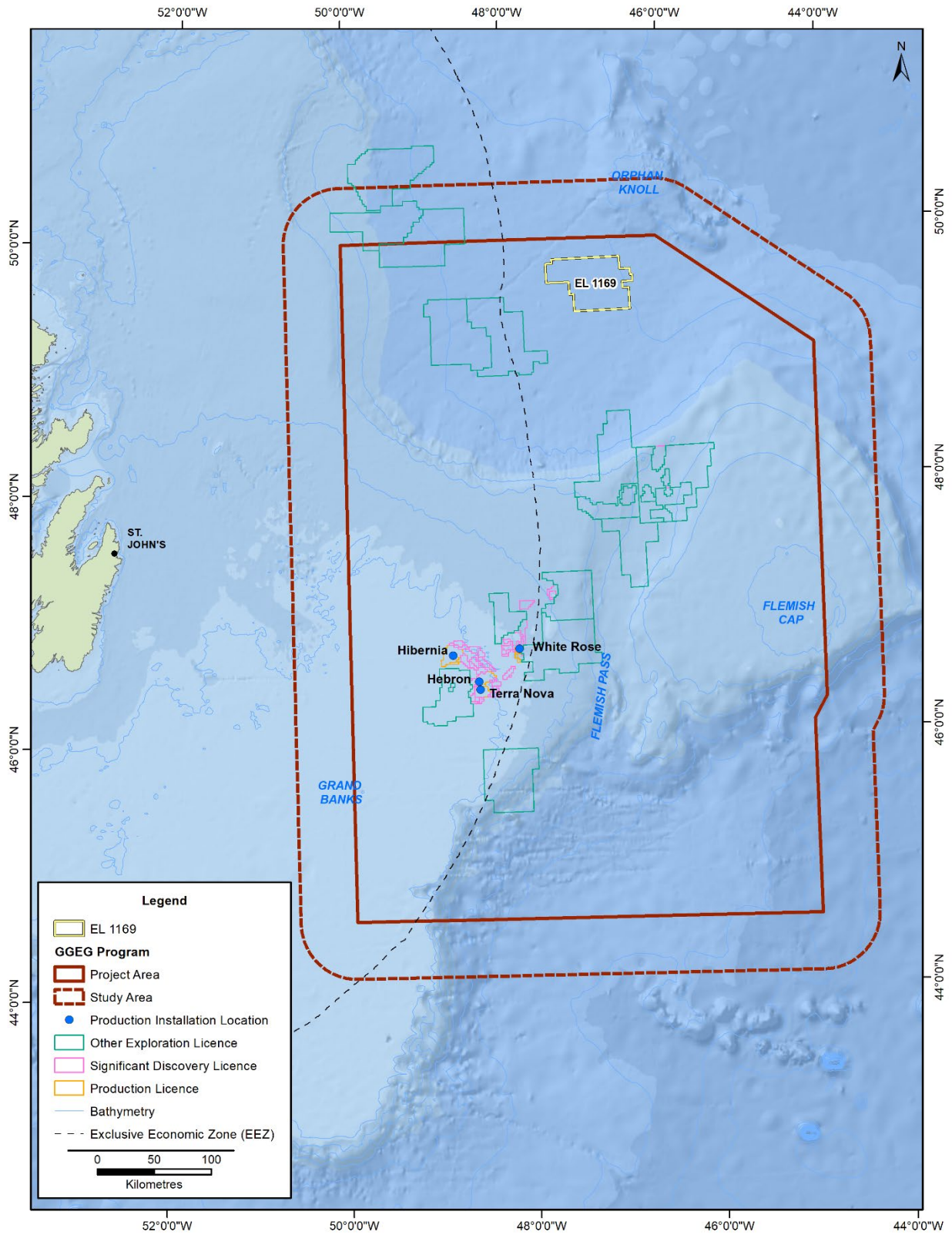


Figure 2-2: Project Area for the Geophysical, Geochemical, Environmental and Geotechnical Program.

2.1.3 EA Commitments, Conditions, and Mitigations

Environmental assessment commitments and conditions that are applicable to 2023 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. Mitigations applicable to 2023 activities are detailed in the EAs:

- in Table 11.2 in the original EIS (Husky Energy 2018).
- Section 5.3 Environmental Planning, Management and Mitigation of the GGEG Program EA Report (ExxonMobil Canada Ltd 2015)

2.2 2023 Project Activities

Planned project activities in 2023 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 (Figure 2-1). The 2023 exploration drilling activities are anticipated to occur between May and October.

2.2.1 Drilling Operations

ExxonMobil is currently planning to drill one firm well in 2023: Gale N-66. The interest holders in EL 1167 are EMCL (Operator at 50% interest), QPI Energy Canada Ltd. (28% interest) and Cenovus Energy Inc (22% interest). For the Gale N-66 well located on EL 1167, EMCL and QPI Energy Canada Ltd are the two interest holders participating in this well. Water depths for the EL range from 117 to 235 m. The exploration well will be drilled in approximately 170 m water depth using the harsh environment mobile offshore drilling unit (MODU) *Hercules*. This MODU will be moored using an eight-anchor spread and dynamic positioning thrusters will be activated as required. 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 mooring system 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. It is estimated that the well will require approximately 45 to 70 days for drilling and evaluation, with associated well abandonment or suspension between August and September 2023.

2.2.2 Follow-up Monitoring

ExxonMobil will be conducting follow-up monitoring for exploration drilling activities in EL 1167 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 underwater sound monitoring, 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 1169, and post-drilling environmental surveys to verify the accuracy of the effects assessment in EL 1167 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.

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 2023 project activities.

Table 2-1: Engagement Activities for the 2023 Exploration Program Activities.

Stakeholder Group	Description of Engagement
Commercial Fishers	<ul style="list-style-type: none"> • October 2022 - Program update provided to One Ocean working group; • October 2022 - Program update provided at September One Ocean Board meeting; • October 2022 – Program update provided to One Ocean Director, Fish Food and Allied Workers Union (FFAW-Unifor), Ocean Choice International (OCI), Atlantic Groundfish Council (AGC) and Association of Seafood Producers (ASP); • January 2023 - Program update provided to One Ocean working group; • January 2023 - Program update provided at January One Ocean Board meeting; • March 2023 - Program update provided to One Ocean Director; • March 2023 - 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 2023 – Provided FFAW Petroleum Liaison Officer with an update on program timing;
Indigenous Groups	<ul style="list-style-type: none"> • March 2023 – Notification of update to external Exploration website. • April 2023 – Provided updated Indigenous Fisheries Communication Plan to reflect 2023 program;
Fisheries and Oceans Canada	<ul style="list-style-type: none"> • March 2023 – Provided C-NLOPB and Department of Fisheries and Oceans Canada (DFO) with Initial Gale N-66 Site Survey Report; • March 2022 – Consult with C-NLOPB and DFO on 2022 site survey design for EL 1151A; • April 2023 – Provided C-NLOPB and DFO Underwater sound Monitoring Plan for review; • April 2023 – Provided C-NLOPB and DFO Gale N-66 Anchor Pattern Site Survey Determination Report for review.
Environment and Climate Change Canada	<ul style="list-style-type: none"> • Jan 2023 – Consult with ECCC-CWS on Scientific Seabird Permit; • March 2023- Consult with C-NLOPB and ECCC-CWS on Seabird Management Plan; • March 2023 – Provided copy of stranded seabird search route for Paul A.

Stakeholder Group	Description of Engagement
	Sacuta.
Impact Assessment Agency of Canada	<ul style="list-style-type: none"> February 2002 - Consult Impact Assessment Agency of Canada regarding consolidation of EL 1151 and EL 1163 into EL 1167.

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 most recently accepted EA for each program, the conservation status of marine fish, marine mammals and sea turtles, and marine and migratory bird species has changed. The two programs will be discussed separately based on the statuses reported in their most recent EA.

3.1.1 Jeanne D'Arc Exploration Drilling Project

Since the most recent EA (Husky Energy 2018), the conservation status of three species of marine fish within the Project Areas has changed, with one new fish species added. The conservation status of nine species of marine and migratory birds within the Project Areas has changed, with two new bird species added. No conservation status for marine mammals or sea turtles has changed, and three new species of marine mammals are added. New recovery strategies, critical habitat, and action plans have been published for many species, and are described below for marine fish, marine and migratory birds, and marine mammals and sea turtles.

3.1.1.1 Marine Fish

The conservation status of several fish species within the Project Areas has changed or been added (Table 3-1) since the most recent approved EA document:

- Blue Shark (*Prionace glauca*): Designated as "Special Concern" in April 2006. Status re-examined and designated "Not at Risk" in November 2016 (COSEWIC 2016).
- Common Lumpfish (*Cyclopterus lumpus*): Designated as "Threatened" in November 2017 and is under consideration for inclusion in SARA Schedule 1 (COSEWIC 2017a).
- Roughhead Grenadier (*Macrourus berglax*): Designated as "Special Concern" in April 2007. Status re-examined and designated "Not at Risk" in November 2018 (COSEWIC 2018a).

- Shortfin Mako (*Isurus oxyrinchus*): Designated as “Threatened” in April 2006. Status re-examined and designated “Special Concern” in April 2017. Status re-examined and designated “Endangered” in May 2019 (COSEWIC 2019a). SARA status also changed from “Not Listed” under COSEWIC in the previous EA (Husky Energy 2018) in 2018 to ‘Endangered’.

Table 3-1: Updated Marine Fish Species at Risk or otherwise of Special Conservation Concern (Jeanne D’Arc Exploration Drilling Project)

Species		Status / Designation ^{1,2}			Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	
Acadian Redfish	<i>Sebastes fasciatus</i>			T	Atlantic (COSEWIC)
American Eel	<i>Anguilla rostrata</i>	V		T	
American Plaice	<i>Hippoglossoides platessoides</i>			T	Newfoundland and Labrador (COSEWIC)
Atlantic Bluefin Tuna	<i>Thunnus thynnus</i>			E	
Atlantic Cod	<i>Gadus morhua</i>			E	Newfoundland and Labrador (COSEWIC)
Atlantic Salmon	<i>Salmo salar</i>			T	South Newfoundland (COSEWIC)
				SC	Quebec Eastern North Shore (COSEWIC)
				SC	Quebec Western North Shore (COSEWIC)
				E	Anticosti Island (COSEWIC)
				SC	Inner St. Lawrence (COSEWIC)
				SC	Gaspé-Southern Gulf of St. Lawrence (COSEWIC)
				E	Eastern Cape Breton (COSEWIC)
				E	Nova Scotia Southern Upland (COSEWIC)
				E	Outer Bay of Fundy Population (COSEWIC)
Atlantic Wolffish	<i>Anarhichas lupus</i>		SC	SC	
Basking shark	<i>Cetorhinus maximus</i>			SC	Atlantic (COSEWIC)
Blue shark	<i>Prionace glauca</i>			NR	Atlantic (COSEWIC)
Cusk	<i>Brosme brosme</i>			E	
Deepwater Redfish	<i>Sebastes mentella</i>			T	Northern (COSEWIC)
Common Lumpfish	<i>Cyclopterus lumpus</i>			T	
Northern (Broadhead) Wolffish	<i>Anarhichas denticulatus</i>		T	T	
Porbeagle shark	<i>Lamna nasus</i>			E	
Roughhead Grenadier	<i>Macrourus berglax</i>			NR	
Roundnose Grenadier	<i>Coryphaenoides rupestris</i>			E	
Shortfin Mako	<i>Isurus oxyrinchus</i>		E	E	Atlantic (COSEWIC)
Smooth Skate	<i>Malacoraja senta</i>			E	Funk Island Deep (COSEWIC)
				SC	Laurentian-Scotian (COSEWIC)

Species		Status / Designation ^{1,2}			Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	
Spiny Dogfish	<i>Squalus acanthias</i>			SC	Atlantic (COSEWIC)
Spotted Wolffish	<i>Anarhichas minor</i>		T	T	
Thorny Skate	<i>Amblyraja radiata</i>			SC	
White Hake	<i>Urophycis tenuis</i>			T	Atlantic and Northern Gulf of St. Lawrence (COSEWIC)
White Shark	<i>Carcharodon carcharias</i>		E	E	Atlantic (COSEWIC/SARA)
Winter Skate	<i>Leucoraja ocellata</i>			E	Eastern Scotian Shelf – Newfoundland (COSEWIC)
<p>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.</p> <p>² Multiple designations refer to multiple populations or sub-populations.</p> <p>Grey cells represent changes to status or addition of species listing from the original EIS.</p> <p>Sources: COSEWIC 2016, 2017a, 2018a, 2019a</p>					

Common lumpfish (*Cyclopterus lumpus*) is a marine fish species broadly distributed across the Northwest Atlantic. They are occasionally caught up to 65°N in Davis Strait but are most abundant further south with the highest estimates of abundance in waters surrounding the island of Newfoundland. The species typically occur in diverse habitats ranging from bottom to water column, at different life stages and seasons. Adult lumpfish are semi-pelagic, spending a greater portion of their time near the bottom in the winter months (COSEWIC 2017a). They exhibit a high degree of sexual dimorphism with females bigger than the males, with the first maturity stage ranging from 28 cm to over 40 cm for females. They are short lived (estimated maximum age of 12 years) with single or multiple spawning. Lumpfish have an estimated decline of about 58% in abundance in the bottom trawl surveys over the last 19-20 years conducted off southern Newfoundland. Historical and current threats to this species include overfishing and destruction of inshore spawning habitat. Predation is another threat to this species as thorny skate and sharks prey on young lumpfish while sperm whales and seals prey on adults. This population was designated as “Threatened” in November 2017 and is under consideration for inclusion in SARA Schedule 1 (COSEWIC 2017a).

3.1.1.1.1 Recovery Strategy 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.

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 (Figure

3-1). Proposed critical habitat was described in the original EA and has since been finalized with no changes from the proposed areas (DFO 2020a). 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 2020a). There is overlap between the Project Area and EL 1167 with the spotted wolffish critical habitat (Figure 3-1). 2023 Project activities that directly interact with benthic habitat is located outside the critical habitat. Wolffish species were considered and assessed in the EA Report (Section 6.1.8 and 9.2.3, Husky Energy 2018) for potential environmental effects of the Project on this species. As drilling activities and environmental surveys in EL 1167 are unlikely to have serious 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.

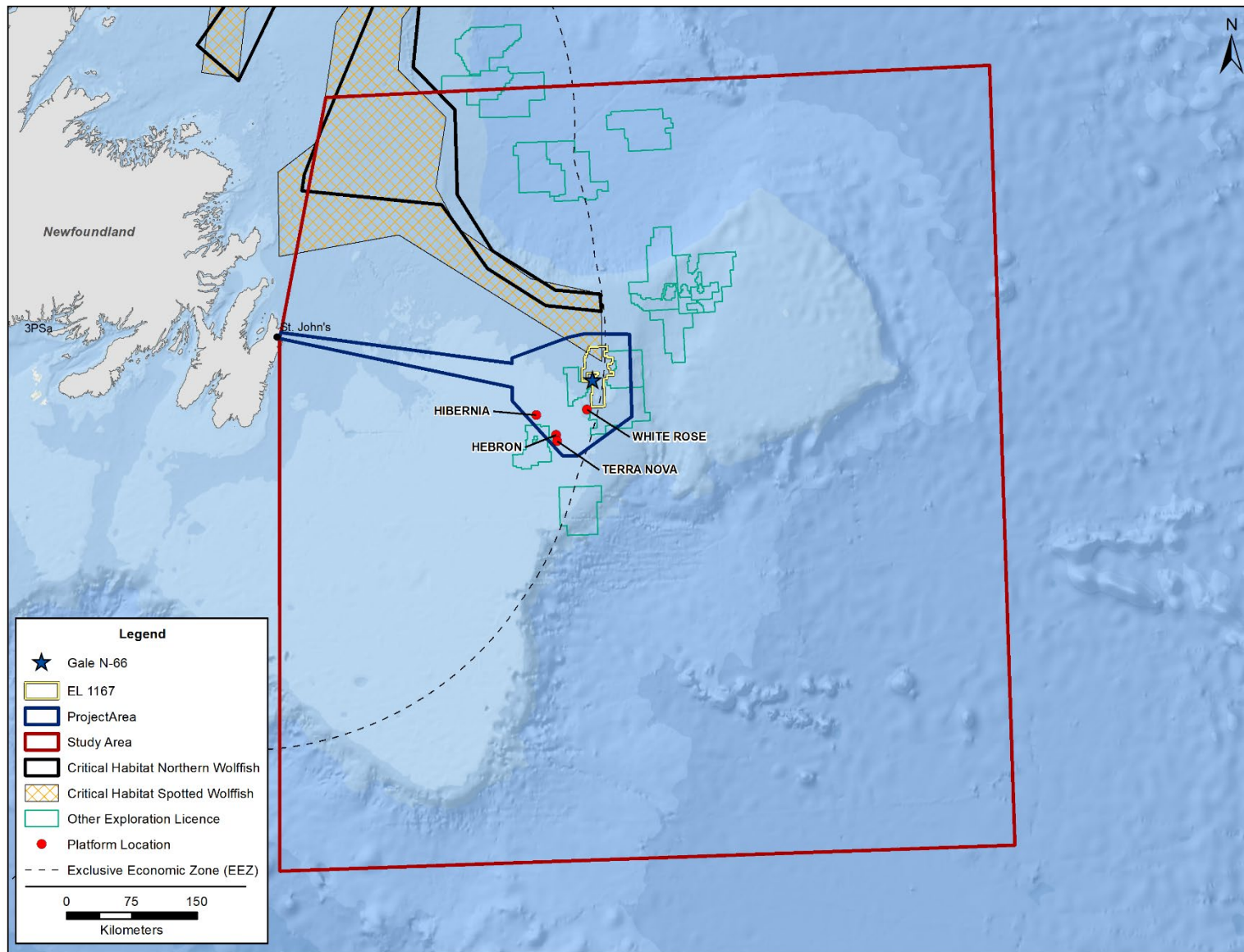


Figure 3-1: Northern and Spotted Wolffish Critical Habitat (DFO 2020a).

3.1.1.2 Marine and Migratory Birds

The conservation status of a few marine and migratory bird species within the Project Areas have changed or been added (Table 3-2) since the most recent approved EA document:

- Red Knot (*rufa* subspecies) (*Calidris canutus rufa*): Population broken out into three different wintering populations in 2020: Tierra del Fuego / Patagonia wintering population retains the “Endangered” listing by COSEWIC and SARA; Southeastern USA / Gulf of Mexico / Caribbean wintering population listed as “Endangered” by COSEWIC; and Northeastern South American wintering population listed as “Special Concern” by COSEWIC (COSEWIC 2020a);
- Buff-breasted Sandpiper (*Tryngites subruficollis*): Designated as “Special Concern” status on Schedule 1 of the SARA in 2017 (Government of Canada 2017);
- Red-necked Phalarope (*Phalaropus lobatus*): Designated as “Special Concern” status on Schedule 1 of the SARA in 2019 (Government of Canada 2019)
- Short-eared owl (*Asio flammeus*): Designated as “Special Concern” in 2008. Status re-examined and designated “Threatened” in 2021 (COSEWIC 2021a);
- Peregrine falcon (*Falco peregrinus anatum/tundrius*): Designated as “Special Concern” in 2007. Status re-examined and designated “Not at Risk” in 2017 (COSEWIC 2017b);
- Bank swallow (*Riparia riparia*): Designated as “Special Concern” status on Schedule 1 of the SARA in 2017 (Government of Canada 2017);
- Grey-cheeked thrush (*Catharus minimus minimus*): Previously designated as “Vulnerable” by the NL ESA. Status re-examined and designated “Threatened” in 2015 (Department of Fisheries, Forestry and Agriculture NL 2023);
- Olive-sided flycatcher (*Contopus cooperi*): Designated as “Threatened” in 2007. Status re-examined and designated “Special Concern” in 2018 (COSEWIC 2018b). Designated as “Special Concern” on Schedule 1 of the SARA in 2023 (Government of Canada 2023).
- Bobolink (*Dolichonyx oryzivorus*): Designated as “Threatened” in 2010. Status re-examined and designated “Special Concern” in 2022 by COSEWIC (COSEWIC 2022). Designated as “Threatened” status on Schedule 1 of the SARA in 2017 (Government of Canada 2017). Designated as “Vulnerable” by the NL ESA in 2015 (Department of Fisheries, Forestry and Agriculture NL 2023);
- Leach’s Storm-Petrels (*Oceanodroma leucorhoa*): Designated as “Threatened” during the 2020 COSEWIC assessment (COSEWIC 2020b); and
- Ross’s Gull (*Rhodostethia rosea*): Designation was changed during the 2021 COSEWIC assessment from “Threatened” to “Endangered” (COSEWIC 2021b).

Table 3-2: Updated Marine and Migratory Bird 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	
Ivory Gull	<i>Pagophila eburnea</i>	E	E	E	
Harlequin Duck	<i>Histrionicus histrionicus</i>	V	SC	SC	Eastern Population (COSEWIC/SARA)
Barrows Goldeneye	<i>Bucephala islandica</i>	V	SC	SC	Eastern Population (COSEWIC/SARA)
Piping Plover (<i>melodus</i> ssp.)	<i>Charadrius melodus melodus</i>	E	E	E	
Red Knot (<i>rufa</i> ssp.)	<i>Calidris canutus rufa</i>	E	E	E	Tierra del Fuego / Patagonia wintering population
			E	E	Southeastern USA / Gulf of Mexico / Caribbean wintering population
			SC	SC	Northeastern South American wintering population
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>		SC	SC	
Red-necked Phalarope	<i>Phalaropus lobatus</i>		SC	SC	
Short-eared Owl	<i>Asio flammeus</i>	V	SC	T	
Peregrine Falcon (<i>anatum/tundrius</i>)	<i>Falco peregrinus anatum/tundrius</i>	C	-	NR	
Bank Swallow	<i>Riparia riparia</i>		T	T	
Grey-cheeked thrush	<i>Catharus minimus minimus</i>	T			Newfoundland subspecies (NL ESA)
Olive-sided flycatcher	<i>Contopus cooperi</i>	T	SC	SC	
Bobolink	<i>Dolichonyx oryzivorus</i>	V	T	SC	
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>			T	Atlantic Population (COSEWIC)
Ross's Gull	<i>Rhodostethia rosea</i>		T	E	

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: COSEWIC 2017b, 2018b, 2020a, 2020b, 2021a, 2021b, 2022, Government of Canada 2017, 2019, 2023, Department of Fisheries, Forestry and Agriculture NL 2023)

Leach's Storm-Petrel is the smallest and most wide-ranging procellariiform in the Northern Hemisphere. The Atlantic population is listed as "Threatened" (COSEWIC 2020b). There are over 80 nesting colonies in eastern Canada, where adults nest in burrows and forage at night for bioluminescent prey (COSEWIC 2020b). There are indications that eight major colonies have experienced declines up to 54% over the

past 44 years, with low adult survival due to gull predation as a key factor (COSEWIC 2020b). Other threats include changes to the food web and interactions with offshore activity, oil and gas platforms, as well as vessels that use artificial lighting due to its unique nocturnal behaviour and its attraction to light. 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 EA (Section 6.4.10.2, Husky Energy 2018) for other marine and migratory bird species will also apply to species of conservation concern, and so the potential environmental effects from the Project are not likely to result in significant adverse effects.

3.1.1.2.1 Recovery Strategy 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.

3.1.1.3 Marine Mammals and Sea Turtles

The conservation status of a few marine mammal species within the Project Areas have been added (Table 3-3) since the most recent approved EA document:

- Sei whale (*Balaenoptera borealis*): Change in COSEWIC status from "Data Deficient" to "Endangered" in 2019 (COSEWIC 2019b);
- Bowhead whale (*Balaena mysticetus*): Designated as "Special Concern" by COSEWIC during 2009 Assessment (COSEWIC 2009); and
- Ringed seal (*Pusa hispida*): Designated as "Special Concern" by COSEWIC in 2019 (COSEWIC 2019c).

Table 3-3: Updated Marine Mammal and Sea Turtle 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	
Blue whale	<i>Balaenoptera musculus</i>		E	E	Atlantic Population (COSEWIC/SARA)
Fin whale	<i>Balaenoptera physalus</i>		SC	SC	Atlantic Population (COSEWIC/SARA)
North Atlantic right whale	<i>Eubalaena glacialis</i>		E	E	
Harbour porpoise	<i>Phocoena phocoena</i>			SC	Northwest Atlantic Population (COSEWIC)
Killer whale	<i>Orcinus orca</i>			SC	Northwest Atlantic / Eastern Arctic Population (COSEWIC)
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>		E	E	Scotian Shelf Population (COSEWIC/SARA)
				SC	Davis Strait – Baffin Bay – Labrador Sea Population (COSEWIC)
Sowerby's beaked whale	<i>Mesoplodon bidens</i>		SC	SC	
Sei whale	<i>Balaenoptera borealis</i>			E	Atlantic Population (COSEWIC)
Bowhead whale	<i>Balaena mysticetus</i>			SC	Eastern Canada – West Greenland Population (COSEWIC)
Ringed seal	<i>Pusa hispida</i>			SC	
Leatherback sea turtle	<i>Dermochelys coriacea</i>		E	E	Atlantic Population (COSEWIC/SARA)
Loggerhead sea turtle	<i>Caretta caretta</i>		E	E	

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: COSEWIC 2009, 2019b, 2019c

The sei whale (Atlantic population) was described in the original EA as a species with a low to moderate likelihood of occurring in the Study Area. It was listed by COSEWIC as Data Deficient, but in 2019 this was changed to Endangered (COSEWIC 2019b). Sei whales are found in all the oceans of the world and generally make seasonal migrations from low-latitude wintering areas to high-latitude summer feeding grounds. In Canada, it occurs off Nova Scotia, Newfoundland, and Labrador. Historically, sei whale populations were reduced from commercial whaling that ended in 1972, and their threats today include ship strikes, marine noise, and entanglement (COSEWIC 2019b). Their population is estimated to be fewer than 1,000 mature individuals, which is below its size at the end of whaling. Descriptions in the original EA for mysticete whales apply to the sei whale, and so no new mitigations are required.

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. While 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 in the Arctic (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 2009). 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.

The ringed seal is added as a species of risk potentially present in the Project Area. They are one of the smallest species of seals and use sea ice as habitat, and as such their range is Arctic and sub-Arctic in Canada. Stable ice is used as breeding grounds for this species, and during the summer months they can use a wide variety of habitats in search of prey. Ringed seals can live up to 45 years and are mature around six years of age (COSEWIC 2019c). While their primary habitat is to the north of the Study Area, they may be an uncommon visitor during the ice-free season. Ringed seals were listed by COSEWIC as Special Concern in 2019, with current and future threats of human expansion in the Arctic and loss of sea ice from rapid climate change (COSEWIC 2019c). They are still an important commercial and cultural species to humans, and a key prey item for polar bears and killer whales in the Arctic. Descriptions in the original EA for other phocid species would apply to the ringed seal as well, and as such no further mitigations are required.

Mitigation measures described in the original EA (Section 6.3.10.2, Husky Energy 2018) for other marine mammals and sea turtle species will also apply to species of conservation concern, and so the potential environmental effects from the Project are not likely to result in significant adverse effects.

3.1.1.3.1 Recovery Strategy and Plans

Action plans and recovery strategies have been released for several species of marine mammals and sea turtles within the Project Areas since the original EA. Critical habitats for the North Atlantic right whale are located in the Roseway Basin and Grand Manan Basin that are located off the western coast of Nova Scotia and therefore are well outside the Study Area. Important areas have been identified for blue whale and leatherback sea turtle and may be used to inform delineation of future critical habitats (DFO 2018, 2020a, 2020b, 2020c). Leatherback sea turtle important feeding 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 2020d). Blue whale important areas along the Grand Banks continental shelf edge are within the Study Area, but do not overlap with the Project Area and EL (DFO 2018). In review of the action plans (North Atlantic right whale, blue whale, and leatherback sea turtle) and recovery strategy (Loggerhead Sea Turtle; DFO 2020e) and important areas, no new or modified mitigation measures are required beyond those already identified in the Exploration Drilling Project EA.

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

Since the previous EA update, the conservation status of two species of marine fish within the Project Areas has changed. No changes have taken place for Marine and Migratory Birds, Marine Mammals,

or Sea Turtles. These changes are a reassessment of a species' status by the International Union for the Conservation of Nature (IUCN). No changes have taken place to species listed by either the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Newfoundland and Labrador Endangered Species Act (NL ESA) or the Species at Risk Act (SARA).

3.1.2.1 Marine Fish

The conservation status of two fish species within the Project Areas has changed (Table 3-1) since the most recent approved EA document (EMCL 2022).

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

- American plaice (*Hippoglossoides platessoides*): Designated as “Endangered” during the 2021 IUCN assessment (was not previously assessed) (Cadrin et al. 2022a); and
- Atlantic halibut (*Hippoglossus hippoglossus*): Designation changed during the 2022 IUCN assessment from “Endangered” to “Near Threatened” (Cadrin et al. 2022b).

No additional biological or ecological information is included here for American plaice or Atlantic halibut 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.

Table 3-4 Updated Marine Fish Species at Risk or otherwise of Special Conservation Concern (GGEG Project)

Species		Status / Designation ^{1,2}				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
Acadian Redfish	<i>Sebastes fasciatus</i>			T	E	Atlantic (COSEWIC); Global (IUCN)
American Eel	<i>Anguilla rostrata</i>	V		T	E	Global (IUCN)
American Plaice	<i>Hippoglossoides platessoides</i>			T	E	Newfoundland and Labrador (COSEWIC); Global (IUCN)
Atlantic Bluefin Tuna	<i>Thunnus thynnus</i>			E	LC	Global (IUCN)
Atlantic Cod	<i>Gadus morhua</i>			E	V	Newfoundland and Labrador (COSEWIC); Global (IUCN)
Atlantic Halibut	<i>Hippoglossus hippoglossus</i>			NR	NT	Global (IUCN)
Atlantic Salmon	<i>Salmo salar</i>			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

Species		Status / Designation ^{1,2}				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
				E		Eastern Cape Breton
				E		Nova Scotia Southern Upland
				E		Outer Bay of Fundy Population
					LC	Global (IUCN)
Basking shark	<i>Cetorhinus maximus</i>			SC	E	Atlantic (COSEWIC); Global (IUCN)
Bigeye Tuna	<i>Thunnus obesus</i>				V	Global (IUCN)
Cusk	<i>Brosme brosme</i>			E		
Deepwater Redfish	<i>Sebastes mentella</i>			T	LC	Northern (COSEWIC); Global (IUCN)
Haddock	<i>Melanogrammus aeglefinus</i>				V	Global (IUCN)
Common Lumpfish	<i>Cyclopterus lumpus</i>			T		
Northern (Broadhead) Wolffish	<i>Anarhichas denticulatus</i>		T	T		
Porbeagle	<i>Lamna nasus</i>			E	V	Global (IUCN)
Roundnose Grenadier	<i>Coryphaenoides rupestris</i>			E	CE	Global (IUCN)
Shortfin Mako	<i>Isurus oxyrinchus</i>			E	E	Atlantic (COSEWIC); Global (IUCN)
Smooth Skate	<i>Malacoraja senta</i>			E	V	Funk Island Deep, Global (IUCN)
Spiny Dogfish	<i>Squalus acanthias</i>			SC	V	Atlantic (COSEWIC); Global (IUCN)
Spinytail Skate	<i>Bathyraja spinicauda</i>				NT	Global (IUCN)
Spotted Wolffish	<i>Anarhichas minor</i>		T	T		
Striped (Atlantic) Wolffish	<i>Anarhichas lupus</i>		SC	SC		
Thorny Skate	<i>Amblyraja radiata</i>			SC	V	Global (IUCN)
White Hake	<i>Urophycis tenuis</i>			T		Atlantic and Northern Gulf of St. Lawrence (COSEWIC)
White Shark	<i>Carcharodon carcharias</i>		E	E	V	Atlantic (COSEWIC/SARA); Global (IUCN)
Winter Skate	<i>Leucoraja ocellata</i>			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.

Species		Status / Designation ^{1,2}				Relevant Population (Where Applicable)
Common Name	Scientific Name	NL ESA	SARA	COSEWIC	IUCN	
Grey cells represent changes to status or addition of species listing from the original EIS. Sources: Cadrin et al. 2022a, 2022b						

3.1.2.2 Marine and Migratory Birds

The conservation status of marine bird species within the Project Area has not changed since the most recent approved EA document.

3.1.2.3 Marine Mammals and Sea Turtles

The conservation status of marine mammal and sea turtle species within the Project Area has not changed since the most recent approved EA document.

3.2 Special Areas

Various changes have been made to special areas since the most recent approved EA documents.

3.2.1 Jeanne D'Arc Exploration Drilling Project

Special areas within and adjacent to the Study Area are illustrated below (Figure 3-2). New or changed special areas since the original EA within the Study Area are described below (Table 3-5).

Table 3-5: Special areas added or changed since the original EA (Husky Energy 2018).

Area Type	Area Name	Description
NAFO Sponge, Coral, and Sea Pen Closure	Flemish Pass/Eastern Canyon 2	Contains large aggregations of large-sized sponges, large gorgonian coral, sea pens, and black coral.
	Northern Flemish Cap 8	Along the edge of the Flemish Cap are large aggregations of sea pens, as well as black corals.
	Northern Flemish Cap 9	
	Northwest Flemish Cap 10	
	Northwest Flemish Cap 12	
	3O Coral Closure	Contains canyons likely to contain VMEs and overlaps with closures for sea pens and small gorgonians.
	Northern Flemish Cap 7a	Along the edge of the Flemish Cap are large aggregations of sea pens, as well as black corals.
	Northwest Flemish Cap 11a	
	Eastern Flemish Cap 14a	
Eastern Flemish Cap 14b		
NAFO Seamount Closure	Fogo Seamount Chain	Closed as a seamount VME element.
	Newfoundland Seamounts	
Significant Benthic Areas (SiBA)	Large Gorgonian Coral	Areas identified using kernel density analysis containing significant concentrations of a given functional/morphological group.
	Small Gorgonian Coral	
	Sea Pens	
	Sponges	
Critical Habitat	Spotted wolffish	Identified critical habitat in areas known to contain features that should allow for recovery and survival of spotted / northern wolffish (see Section 3.1.1.1).
	Northern Wolffish	

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

Special areas within and adjacent to the Study Area are illustrated below (Figure 3-2). New or changed special areas since the most recent EA Update within the Study Area are described below (Table 3-6).

Table 3-6 Special areas added or changed since the most recent EA Update (EMCL 2022).

Area Type	Area Name	Description
NAFO Sponge, Coral, and Sea Pen Closure	Tail of the Bank 1	Contains important concentrations of large-sized sponges, sea squirts, erect bryozoans, sea pens, and small and large gorgonian coral.
	Flemish Pass/Eastern Canyon 2	Contains large aggregations of large-sized sponges, large gorgonian coral, sea pens, and black coral.
	Northern Flemish Cap 8	Along the edge of the Flemish Cap are large aggregations of sea pens, as well as black corals.
	Northern Flemish Cap 9	
	Northwest Flemish Cap 10	
	Northwest Flemish Cap 12	
	3O Coral Closure	Contains canyons likely to contain VMEs and overlaps with closures for sea pens and small gorgonians.
	Northern Flemish Cap 7	Along the edge of the Flemish Cap are large aggregations of sea pens, as well as black corals.
	Northern Flemish Cap 7a	
	Northwest Flemish Cap 11a	
	Eastern Flemish Cap 14a	
	Eastern Flemish Cap 14b	
	NAFO Seamount Closure	Fogo Seamount Chain
Newfoundland Seamounts		

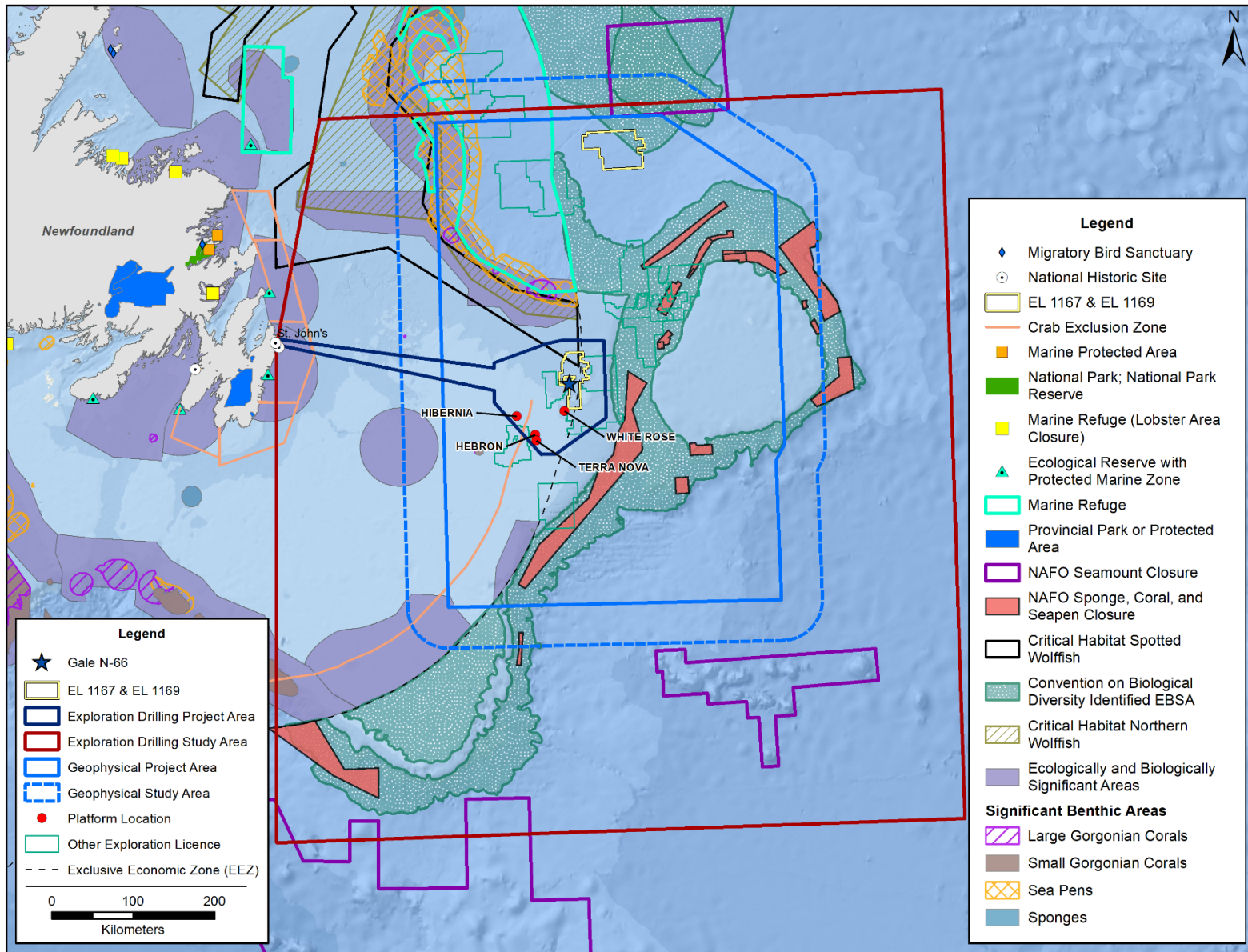


Figure 3-2: Special areas within and adjacent to both of the Study Areas.

3.3 Commercial Fisheries

Based on available datasets (2017-2021), commercial fisheries activity in the Project Area is similar to datasets presented in the Jeanne D'Arc Exploration Drilling Project EA (refer to Section 4.3.1 of the original EA, Husky Energy 2018) and those presented in the GGEG EA Update (refer to Section 3.3 in the 2022 EA Update, EMCL 2022). The most recently available data presented for the Jeanne D'Arc Exploration Drilling Project EA was 2016, and the most recent data for the GGEG EA was 2020. Figure 3-3 to Figure 3-7 provide updated geographic distribution of domestic commercial fishing activity within and adjacent to the Project Areas from 2017 to 2021, with lists of groundfish and pelagic species in Table 3-7. 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 2017 to 2021, 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 2017-2021 is similar to what was presented in each of the previous EAs. Fixed gear domestic harvesting locations remain distributed in similar areas throughout the Project and Study Areas among the two datasets. Mobile gear domestic harvesting locations remain distributed to the north of the Project Area but has a relatively lower footprint within the Project and Study Area for the Jeanne D'Arc Exploration Drilling program. For EL 1169 (GGEG), very limited catches were recorded in 2018 within the EL, with fixed and mobile gear in similar locations in 2021 compared to the previous EA Update.

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 2023 Project Activities and minimize potential effects.

Table 3-7 Groundfish and Pelagic Species Caught Within the Study Areas

Groundfish		Pelagic	
American plaice	Atlantic halibut	Capelin	Mako shark
Atlantic cod	Monkfish	Eel	Porbeagle shark
Cusk	Pollock	Atlantic herring	Swordfish
Grenadier	Redfish	Mackerel	Albacore tuna
Greyscale/Witch flounder	Skate	Blue shark	Bluefin tuna
Haddock	Greenland halibut		
White hake	Yellowtail flounder		
Sculpin	Northern wolffish		

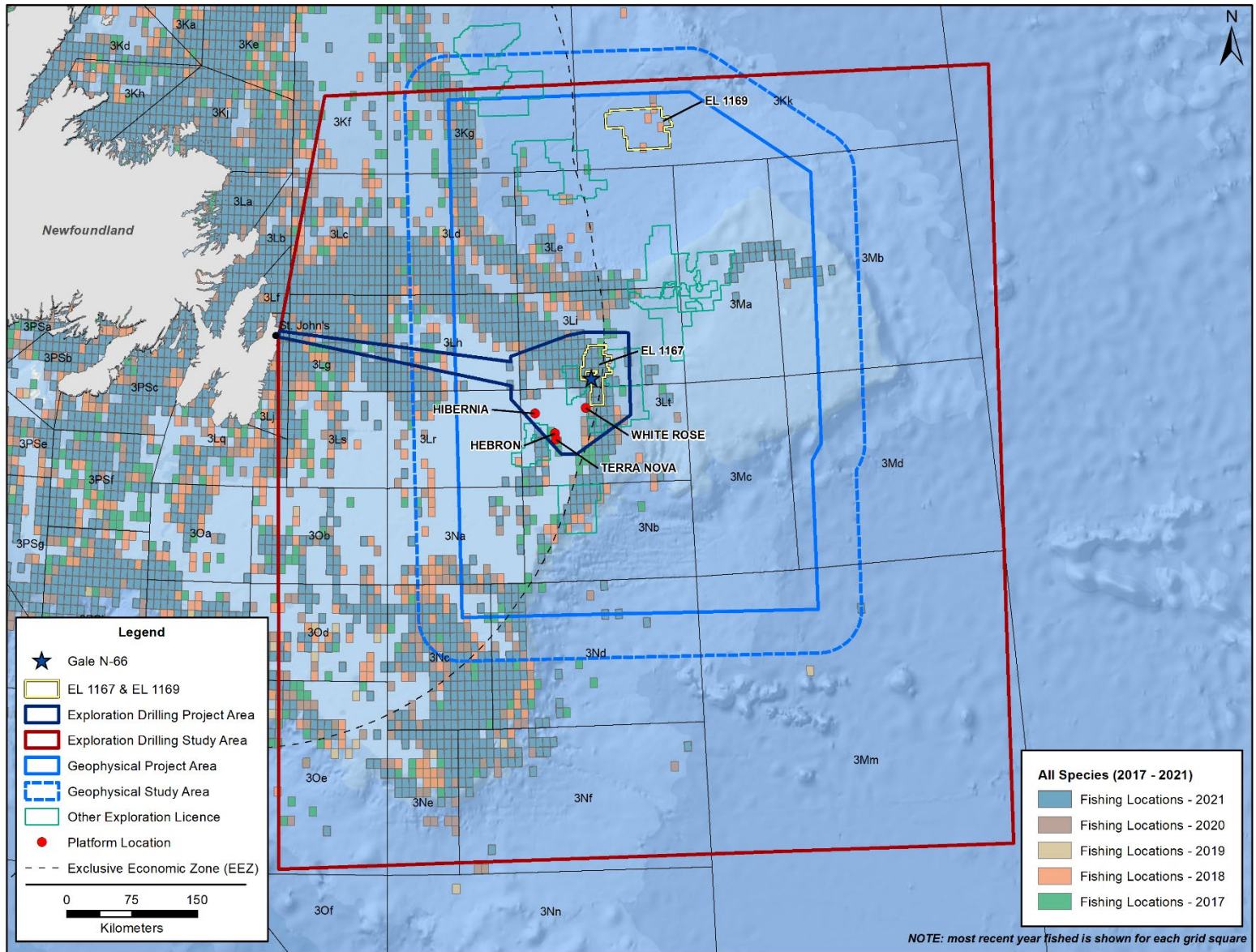


Figure 3-3: Commercial Fishing Intensity; All Species (2017-2021).

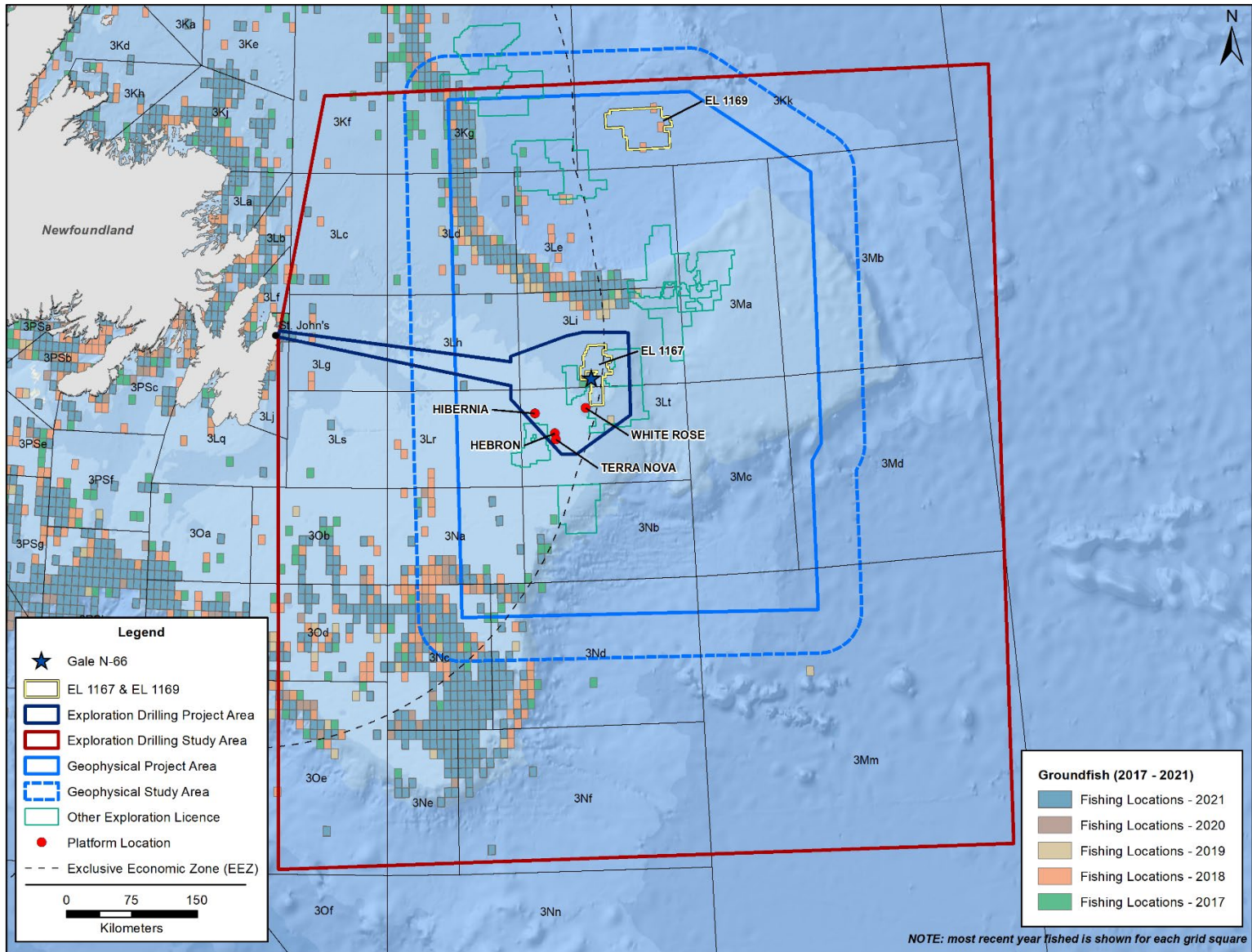


Figure 3-4: Commercial Fishing Intensity; Groundfish Species (2017-2021).

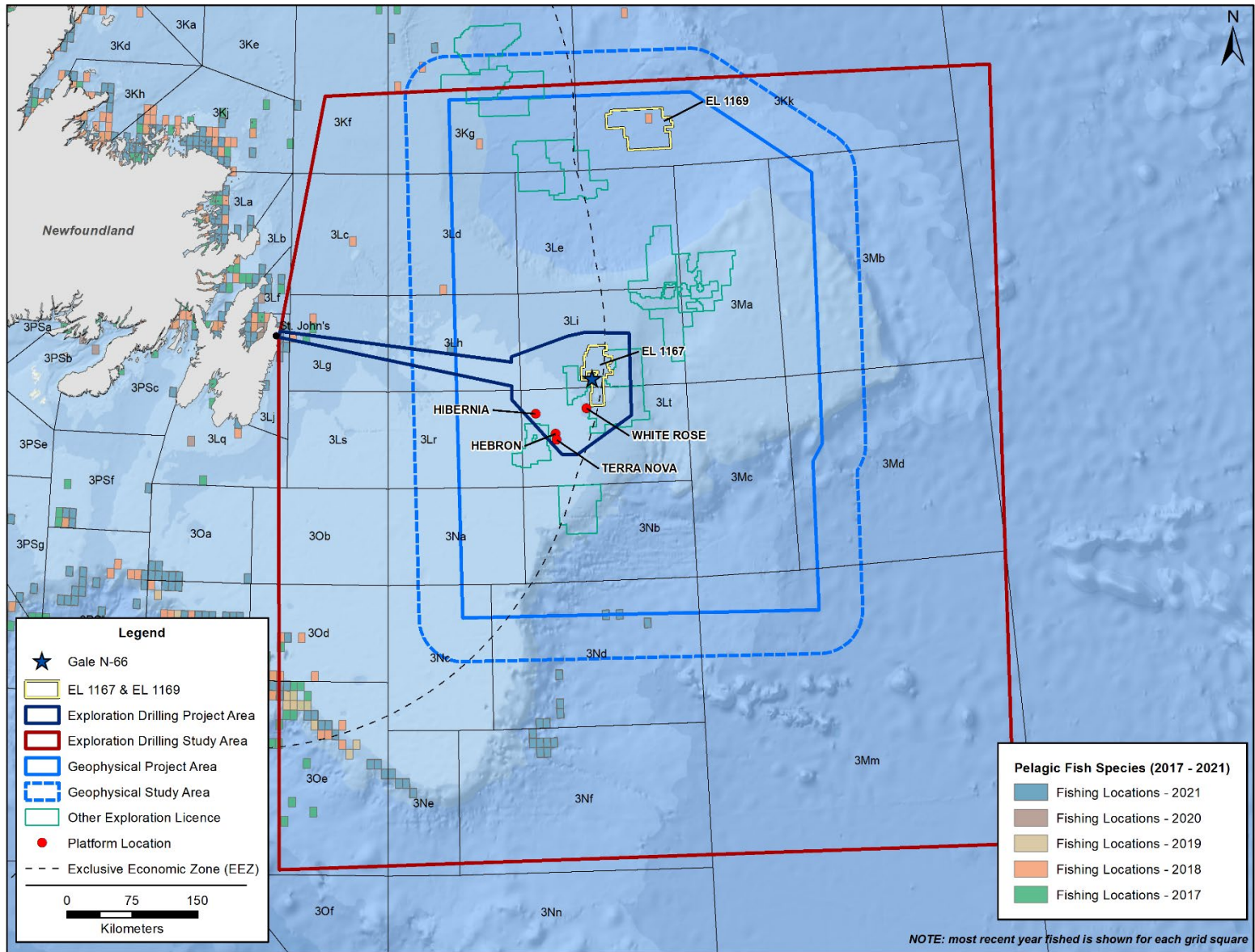


Figure 3-5: Commercial Fishing Intensity; Pelagic Species (2017-2021).

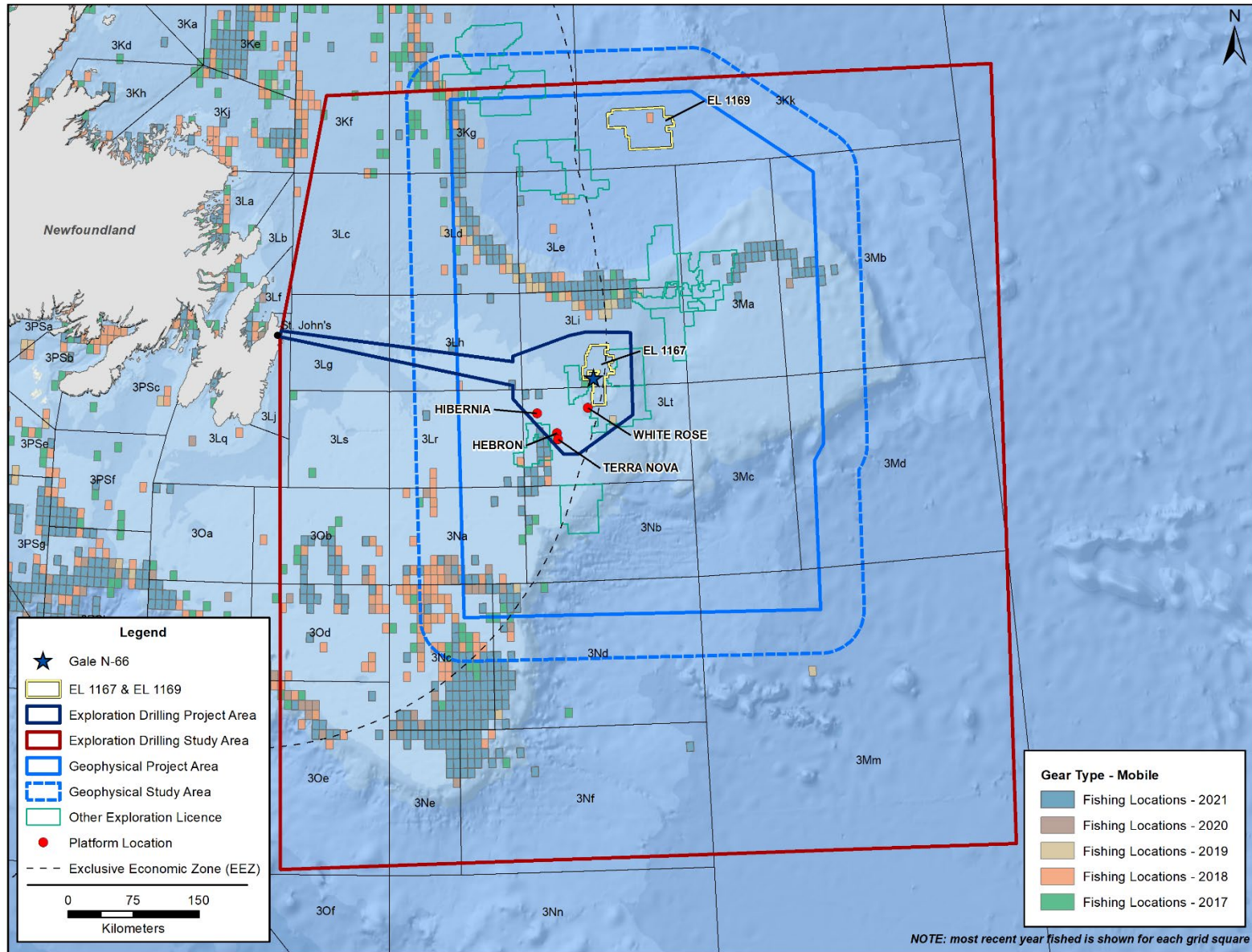


Figure 3-6: Commercial Fishing Locations; Mobile Gear Types (2017-2021).

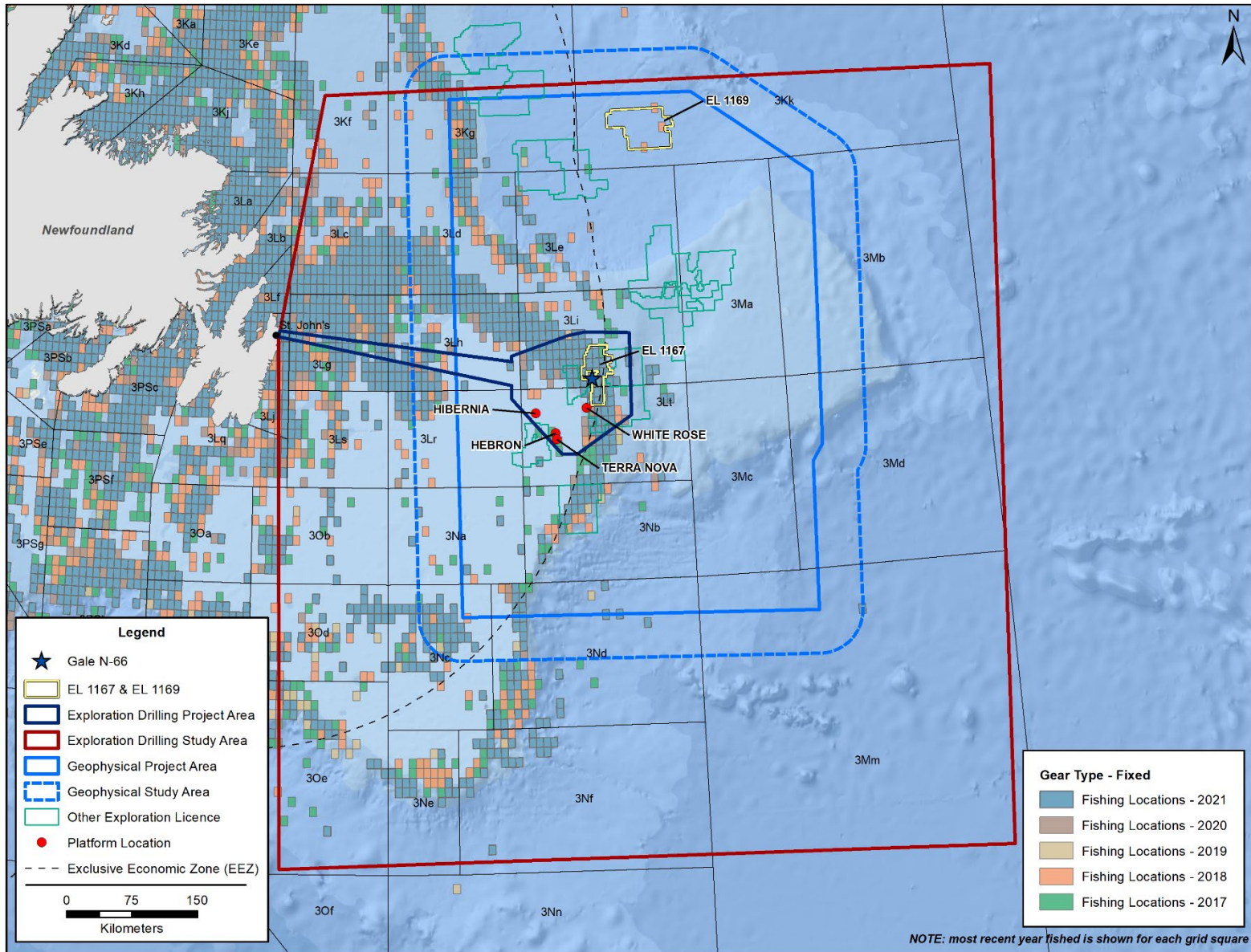


Figure 3-7: Commercial Fishing Locations; Fixed Gear Types (2017-2021).

4 ACCIDENTAL EVENTS

There are no updates to accidental events for EL 1169 (GGEG program). Updated modelling for EL 1167 (Jeanne D'Arc Exploration Drilling Project) is provided below.

4.1 EL 1167 Update to Worst-Case Unmitigated Hydrocarbon Release Scenario

The worst-case discharge rate for the planned Gale N-66 well for an unmitigated hydrocarbon release has been updated and was provided to the C-NLOPB for review in April 2023. The predicted worst-case discharge rate for the Gale N-66 well for an unmitigated hydrocarbon release without any pipe in the hole has increased to 204,000 bbls/day based on updated information on reservoir characteristics. The EIS spill model and accidental events assessment considered a subsea blowout scenario flow rate of 40,473 bbls/day (Husky Energy 2018). To inform the potential zone of influence from the updated release rate, a review was conducted of available spill models of similar water depth, crude oil type, release parameters, and location to the updated worst-case scenario for EL 1167 (RPS 2022). The previously conducted EL 1151 spill model scenario (RPS 2019) prepared for ExxonMobil was determined to yield the most similar spill trajectories as for Gale N-66 (EL 1167).

Compared to the modelled scenario used for Gale N-66 (EIS Scenario, 40,473 bbls/day, Husky Energy 2018), the footprint of the modelled unmitigated spill at EL 1151 (116-day release, 191,930 bbls/day release rate) would extend east of the EIS Study Area to include waters (surface and water column) of the mid-Atlantic. This is similar to the original EIS modelling that showed spill trajectory probabilities of >50% in some months to extend eastward up to the model boundary. The probability of shoreline contamination remains low, though is higher for the EL 1151 unmitigated spill scenario (3.2-6.8%) than the EIS scenario (<1%). Oil predicted to reach benthic areas would be below ecological impact thresholds due to the low concentrations (<0.1 to 0.5 g/m²) (RPS 2019). In the EIS, benthic impacts from a subsea blowout were not modelled but estimated to be confined to the immediate vicinity of the well.

The modelled mitigated spill at EL 1151 (21-day release with response actions, 191,930 bbls/day release rate) would extend just east of EIS Study Area. Small areas of dark brown surface oil (0.01-0.1 mm) may potentially occur east of the Study Area (RPS 2019). This is similar to the original EIS modelling (40,473 bbls/day) that showed spill trajectory probabilities of >50% in some months to extend eastward past the EIS Study Area and model boundary (Husky 2018). Dissolve hydrocarbons within the water column based on a mitigated spill at EL 1151 are estimated to be within the EIS Study Area. No shoreline oiling was predicted in the mitigated scenario, whereas the EIS scenario predicted a very low potential (<1%) for shoreline oiling. Oil predicted to reach benthic areas would be very low (0.01% of total released oil) and below ecological impact thresholds due to the low concentrations (<0.1 to 0.5 g/m²) (RPS 2019). Benthic impacts in the EIS were estimated to be confined to the immediate vicinity of the well.

The modelling for the EL 1151 could also be considered to be an overestimate as the footprint is likely larger than it would be for Gale N-66 due to crude oil characteristics. Although different hypothetical release rates, the spill scenario assessed in the EIS (Husky Energy 2018) and EL 1151 had similar trajectories. Oil from an unmitigated release would largely travel to the south, southeast, and east of the well site toward the Flemish Pass and Flemish Cap (Husky Energy 2018, RPS 2019).

4.2 Assessment of Adverse Environmental Effects

The predicted environmental effects of potential accidental events including a subsurface blowout are detailed in Section 7.0 of the EIS (Husky Energy 2018). Each valued component (VC) was evaluated based on the different spill scenarios (e.g., batch spill, subsurface blowout). The effects assessment was reviewed in the context of a higher release rate from a spill to understand if it changes the validity of overall environmental assessment of accidental spills on the Project. The spill modelling for EL 1151 used a conservative estimate of probabilities, trajectories, and footprints to predict the effects on each VC. This has been completed for VCs evaluated in the EIS: Fish and Fish Habitat, Migratory Birds, Marine Mammals and Sea Turtles, Special Areas, Indigenous People and Community Values, and Commercial Fisheries.

4.2.1 Marine Fish and Fish Habitat

The EIS describes the effects of accidental events on Fish and Fish Habitat in EIS Section 7.3.1.1 and 7.3.1.3. The assessment considered the potential effects on plankton, early and adult fish life stages, sensitive benthic organisms (e.g., corals and sponges) and changes to habitat quality for the Study Area (Grand Banks, Flemish Pass, Flemish Cap).

Based on the EL 1151 mitigated spill modelling (21-day release with response actions), the geographic extent of potential effects in the water column would likely be within the Study Area. Small areas of dark brown surface oil (0.01-0.1 mm) may potentially occur west of the Study Area (RPS 2019). However, the potential surface oil footprints for Gale N-66 would likely be lower than the EL 1151 model predictions indicate due to a less persistent crude oil type (RPS 2022). In the mitigated scenario, no shoreline oiling was predicted and oil exposure to benthic environments would be low.

In consideration of spill prevention techniques and response strategies, the potential geographic extent of residual effects on Fish and Fish Habitat would increase due to the potential for surface oiling outside the Study Area. However, the potential surface oil footprints outside the Study Area are low and the modelling is conservative for Gale N-66. Overall, the residual environmental effects characterization remains the same as originally predicted: adverse, moderate magnitude, short to medium duration, single event frequency, and reversible. The modification to the release rate does not change or modify any of the existing conclusions in the EIS regarding the effects on Fish and Fish Habitat.

4.2.2 Marine and Migratory Birds

The EIS Addendum summarized the effects of accidental events on Marine and Migratory Birds in EIS Section 7.3.4.1 and 7.3.4.3. The assessment considered the direct effects of oil exposure, sublethal effects, changes to habitat quality, and displacement from oiled areas.

Based on the EL 1151 mitigated spill modelling (21-day release with response actions), the geographic extent of potential effects in the water column would likely be within the Study Area. Small areas of dark brown surface oil may potentially occur west of the Study Area (RPS 2019). However, the potential surface oil footprints for Gale N-66 would likely be lower than the EL 1151 model predictions indicate due to a less persistent crude oil type (RPS 2022).

In consideration of spill prevention techniques and response strategies, the potential geographic extent of residual effects on Marine and Migratory Birds would increase due to the potential for surface oiling west of the Study Area. However, the potential surface oil footprints outside the Study Area are low and the modelling is conservative for Gale N-66. Overall, the residual environmental effects characterization

remains the same as originally predicted: adverse, high magnitude, short to medium term duration, single event frequency, and reversible. The modification to the discharge rate does not change or modify any of the existing conclusions in the EIS regarding the effects on Marine and Migratory Birds.

4.2.3 Marine Mammals and Sea Turtles

The EIS summarized the effects of accidental events on Marine Mammals and Sea Turtles in Sections 7.3.3.1 and 7.3.3.3. The assessment considered direct mortality or injury from oil exposure (e.g., oil fouling and ingestion), change in habitat quality, and contamination of food sources.

Based on the EL 1151 mitigated spill modelling (21-day release with response actions), the geographic extent of potential effects in the water column would likely be within the Study Area. Small areas of dark brown surface oil may potentially occur west of the Study Area (RPS 2019). However, the potential surface oil footprints for Gale N-66 would likely be lower than the EL1151 model predictions indicate due to a less persistent crude oil type (RPS 2022).

In consideration of spill prevention techniques and response strategies, the potential geographic extent of residual effects on Marine Mammals and Sea Turtles would increase due to the potential for surface oiling outside the Study Area. However, the potential surface oil footprints outside the Study Area are low and the modelling is conservative for Gale N-66. The geographic extent of potential effects in the water column would likely be within the Study Area. Overall, the residual environmental effects characterization remains the same as originally predicted: adverse, high magnitude, short to medium term duration, single event frequency, and reversible. The modification 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.

4.2.4 Special Areas

The original EIS assessed the special areas that were likely to be affected by a subsurface blowout (that is within the footprint or adjacent) (see Section 7.3.5 in Husky Energy 2018). The assessment considered a change in the habitat quality of special areas and resident species.

Based on the EL 1151 mitigated spill modelling, no additional special areas would be affected by the eastern trajectory of a potential mitigated spill. In consideration of spill prevention techniques and response strategies, residual effects on Special Areas would not change from what was originally predicted: adverse, high magnitude, within the Study Area, short to medium term duration, single event frequency, and reversible. The modification to the discharge rate does not change or modify any of the conclusions in the EIS regarding the effects on Special Areas.

4.2.5 Indigenous People and Community Values

The EIS Addendum summarized the effects of accidental events on Indigenous People and Community Values in EIS Sections 7.3.6.1 and 7.3.6.3. The assessment considered potential direct effects on Indigenous fishing and indirect effects on socio-economic conditions (i.e., effects on commercial communal and food, social and ceremonial (FSC) fishing).

Based on the EL 1151 mitigated spill modelling, there is little potential for spills to reach and adversely affect Indigenous Communities in eastern Canada. It also remains unlikely that there would be a significant effect on marine fish, birds, and mammals that would affect the use of these species for traditional purposes by Indigenous groups. 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, high magnitude, within the Study Area, long term duration, single event frequency, and reversible. The modification to the discharge rate does not change or modify any of the conclusions in the EIS regarding the effects on Indigenous Communities and Activities.

4.2.6 Commercial Fisheries

The effects of accidental events on Commercial Fisheries are detailed in EIS Sections 7.3.2.1 and 7.3.2.3. The assessment considered a change in access to fishing grounds, damage to fishing gear, fish taint, and negative effects on the marketability of fish products.

In consideration of spill prevention techniques and response strategies, the potential geographic extent of residual effects on Commercial Fisheries would increase due to the potential for surface oiling west of the Study Area. However, the potential surface oil footprints outside the Study Area are low and the modelling is conservative for Gale N-66. In consideration of spill prevention techniques and response strategies, residual effects on Commercial Fisheries would not change from what was originally predicted: adverse, high magnitude, occur within the Study Area, short to medium term duration, single event frequency, and reversible. The modification to the discharge rate does not change or modify any of the conclusions in the EIS regarding the effects on Commercial Fisheries and Other Ocean Users.

4.2.7 Potential of Additional Mitigations

ExxonMobil will carry out exploration drilling in accordance with the requirements of the Newfoundland Offshore Petroleum Drilling and Production Regulations (SOR 2009-316). This includes the development and approval of an Environmental Protection Plan (EPP) that identifies environmental emergencies and associated response procedures. An overview of spill prevention and response is detailed in EIS Section 7.1 (Husky Energy 2018) and includes regulatory requirements, spill management, response strategy, response operations, and waste management. The mitigations and response strategy outlined in the EIS are specific to Husky, however, ExxonMobil would have similar and comparable responses and the Project is subject to the same regional guidelines and regulations under the C-NLOPB.

Oil spill events are classified in tiers based on an international planning standard. The spill scenario of 44,473 bbls/day release rate assessed in the original EA and the updated spill scenario of 204,000 bbls/day release rate would both be classified as a Tier 3 spill. A spill event of this size 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. ExxonMobil's response will be tailored to the actual spill and is summarized below:

Incident Command System: ExxonMobil has adopted the Incident Command System organizational structure for emergency response management that provides a systematic approach to incident management and emergency response, providing clear roles and responsibilities as well as lines of communication between different functional groups involved in the response.

Response Contractors and Agencies: ExxonMobil will draw on external resources as necessary for Tier 3 spill response. This may include the use of response organizations such as Eastern Canada Response Corporation (ECRC) and, in particular, for Tier 3 spills, Oil Spill Response Limited (OSRL). Assistance can also be provided through mutual aid agreements with other operators.

Spill Response Tactics and Spill Impact Mitigation Assessment: The Oil spill response plan (OSRP) considers a range of offshore spill response tactics including natural

attenuation/degradation, mechanical containment and recovery, in situ burning, and chemical dispersion. A Spill Impact Mitigation Assessment (SIMA) will be undertaken by ExxonMobil as part of the OSRP during the Operations Authorization (OA) approval process with the C-NLOPB. The SIMA will evaluate the benefits and drawbacks of different response tactics considering the feasibility and effectiveness of implementation in different spill scenarios and prevailing conditions.

Chemical Dispersion: Dispersants are products used in oil spill response to enhance natural microbial degradation, a naturally occurring process where microorganisms remove oil from the environment. ExxonMobil will not use dispersants without prior regulatory approval. If dispersant use is advisable in the event of a spill (as informed by a SIMA process), ExxonMobil will seek approval from the CNLOPB Chief Conservation Officer.

Shoreline Protection and Clean Up: In the event oil is predicted to make contact with shoreline areas, measures to protect these areas can be implemented. Barriers (boom and berms) can be used to deflect and protect sensitive coastal environments from surface oil. In the event that oil is predicted to reach the shoreline, or makes contact with the shore, a shoreline response program will be initiated.

Oiled Wildlife Response: Oiled wildlife response may be required for fauna encountered at sea and on the shorelines of Newfoundland. The Operator will draw upon the expertise and equipment of specialist contractors to support the oiled wildlife response effort.

Remediation: The Operator would use their internal specialists and external remediation expertise and contractors (e.g. OSRL, ECRC) to develop and implement long-term remediation strategies and plans. These would be developed in consultation with the C-NLOPB and the National Environmental Emergencies Centre (NEEC) and other government agencies as necessary.

Financials: In addition to the spill response measures, pursuant to *Energy Safety and Security Act* and described in the Guidelines Respecting Financial Requirements (NEB et al. 2017), an Operator must demonstrate that they have the financial resources to meet a liability obligation of \$1 billion in order to obtain an authorization to drill offshore exploration wells in the Newfoundland and Labrador Offshore Area.

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

4.2.8 Determination of Significance

As the higher estimated release rate from 44,473 bbls/day to 204,000 bbls/day for a mitigated (21-day release with response actions) subsurface blowout scenario is not predicted to change the residual effects assessment on the VCs based on regional spill modelling that is in a similar water depth, crude oil type, release parameters, and location. All of the mitigation measures and commitments outlined in the EIS remain applicable and will continue to be implemented and adhered to by ExxonMobil in the planning and executing of this Project. Therefore, the EIS 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 Section 7.3, summarised as the following for each VC:

Fish and Fish Habitat: "...the predicted residual environmental effects from any of the accidental event scenarios on fish and fish habitat is not significant such that a significant decline in abundance or change in fish population is unlikely within the Study Area, does not jeopardize the achievement of self-sustaining population objectives for listed species, unlikely to result in permanent and irreversible loss of critical habitat, or result in serious harm to fish as defined by the *Fisheries Act*."

Commercial Fisheries: "Given the extensive nature of the worst-case, unmitigated blowout event, a significant effect is conservatively predicted for commercial fisheries for this scenario. The

likelihood of this significant effect occurring is considered low, given the very low potential for a blowout to occur (see Section 7.2.2 of the original EIS) and given the response measures that would be in place to mitigate potential effects.”

Marine Mammals and Sea Turtles: “...the predicted residual environmental effects from any of the accidental event scenarios on marine mammals and sea turtles is not significant (i.e., not predicted to cause a decline in abundance or change in distribution of marine mammal or sea turtle populations within the Study Area, jeopardizes the achievement of self-sustaining population objectives or recovery goals for listed SARA species; or results in permanent and irreversible loss of critical habitat). Depending on the time of year, location of animals within the affected area, and type of oil spill, the effects of an offshore oil release on the health of cetaceans is not predicted to cause a decline in abundance or change in distribution of marine mammal or sea turtle populations within the Study Area; jeopardize the achievement of self-sustaining population objectives for listed SARA species; or result in permanent/irreversible loss of critical habitat.”

Migratory Birds: “...a precautionary conclusion is drawn that the residual adverse environmental effect of a blowout incident is predicted to be significant for migratory birds, but not likely to occur. Although hydrocarbon spills would likely be significant at the individual level, these environmental effects are predicted to be reversible at the population level. The threshold for significance used in this environmental assessment is: if the consequences are carried over more than one generation; or self-sustaining population objectives or recovery goals for listed species are jeopardized. This is considered possible but unlikely given the low probability of a large spill event to occur and the response that would be in place to reduce the consequences of such an event.”

Special Areas: “Spill modelling originating at water depths within the Project Area indicates the majority of the oil will remain within the surface layers of the water column, so benthic habitat and corals within special areas are less prone to effects. Benthic habitat within the immediate area of a blowout would be at risk, but over a relatively small scale. Benthic habitat and organisms in these areas may also be affected by the deposition of weathered oil particles from an oil spill outside the immediate area. Some of these compounds may eventually be deposited on the seabed at extremely low concentrations over a large area, posing no risk to marine life (IPIECA-IOGP 2015). In no case is it predicted that the special areas would be affected on a permanent basis, nor is it predicted that the resident species would be affected in such a way that natural recruitment is unable to return the population or community to its former level within several generations. The residual environmental effect of a change in habitat quality for special areas for a surface or subsea blowout, and batch spill scenarios is therefore predicted to be not significant.”

Indigenous People and Community Values: “Given the extensive nature of the worst-case, unmitigated blowout event, a significant effect is conservatively predicted for Indigenous people and community values for this scenario including potential socio-economic effects. The likelihood of this significant effect occurring is considered low, given the very low potential for a blowout to occur (see Section 7.2.2 in the original EIS) and given the response measures that would be in place to mitigate potential effects.”

5 ENVIRONMENTAL EFFECTS ASSESSMENT AND SUMMARY

ExxonMobil is undertaking a marine petroleum exploration program in the eastern portion of the Canada-Newfoundland and Labrador Offshore Area, as well as a geophysical, geochemical, environmental and geotechnical program in the Orphan Basin. This document comprises the 2023 EA Update for both Projects.

As described in the preceding sections, the planned 2023 activities associated with the Projects are in keeping with the nature and scope (project, temporal, spatial) of the Projects 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 finalized since posting of the Exploration Drilling EIS. Regionally, there have been additional special areas including NAFO closures, critical habitats, and Significant Benthic Areas (SiBAs). The distribution and intensity of available commercial fishing activities (2017-2021) 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 1167 indicated that the discharge rate for an unmitigated hydrocarbon release would be higher than what was assessed in the Jeanne D'Arc Exploration Drilling EIS. However, the estimated change not predicted to change the residual effects assessment on the VCs.

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) remain applicable to the nature and scope of the planned 2023 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 Projects – including the planned 2023 Project survey activities described herein - is therefore not likely to result in significant adverse environmental effects.

6 REFERENCES

- Cadrin, S., González Troncoso, D., Wheeland, L., and Munroe, T.A. 2022a. *Hippoglossoides platessoides*. The IUCN Red List of Threatened Species 2022: e.T18214783A162705101.
- Cadrin, S., González Troncoso, D., Hallfredsson, E., and Munroe, T.A. 2022b. *Hippoglossus hippoglossus*. The IUCN Red List of Threatened Species 2022: e.T10097A148035632.
- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2016, June 9. Determination of Significance: ExxonMobil Canada Ltd. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Program 2015-2024
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2009. COSEWIC Assessment and Update Status Report on the Bowhead Whale *Balaena mysticetus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC assessment and status report on the Blue Shark *Prionace glauca*, North Atlantic population and North Pacific population, in Canada.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2017a. COSEWIC

- assessment and status report on the Lumpfish *Cyclopterus lumpus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Page xi + 78.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2017b. COSEWIC assessment and status report on the Peregrine Falcon *Falco peregrinus* (*pealei* subspecies - *Falco peregrinus pealei* and *anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2018a. COSEWIC assessment and status report on the Roughhead Grenadier, *Macrourus berglax*, in Canada. Page xii + 38. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2018b. COSEWIC assessment and status report on the Olive-sided Flycatcher *Contopus cooperi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 52 pp.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2019a. COSEWIC Assessment and Status Report on the Shortfin Mako *Isurus oxyrinchus*, Atlantic population, Canada. Page xi + 38 pp. Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2019b. COSEWIC assessment and status report on the Sei Whale *Balaenoptera borealis*, Atlantic population, in Canada. Page xi+27. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2019c. COSEWIC assessment and status report on the Ringed Seal *Pusa hispida* in Canada. Page xii+82. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2020a. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2020b. COSEWIC assessment and status report on the Leach's storm-petrel, *Oceanodroma leucorhoa*, Atlantic population, in Canada. Page xii + 70. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2021a. COSEWIC assessment and status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2021b. COSEWIC assessment and status report on the Ross's gull, *Rhodostethia rosea*, in Canada. Page xii + 35. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2022. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada.
- Department of Fisheries, Forestry and Agriculture, Newfoundland and Labrador. 2023. NL ESA Species at Risk - Birds.
- DFO (Fisheries and Oceans Canada). 2018. Identification of habitats important to the blue whale in the western North Atlantic. Canadian Science Advisory Secretariat Science Advisory Report 2018/003:16.
- DFO (Fisheries and Oceans Canada). 2020a. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Page vii + 81 p. Fisheries and Oceans Canada, Ottawa.
- DFO (Fisheries and Oceans Canada). 2020b. Action Plan for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic Population, in Canada. Page iv + 23 pp. Fisheries and Oceans, Ottawa.

- DFO (Fisheries and Oceans Canada). 2020c. Action Plan for the Leatherback Sea Turtle (*Dermochelys coriacea*), Atlantic population, in Canada. Page iv + 28. Fisheries and Oceans Canada, Ottawa.
- DFO (Fisheries and Oceans Canada). 2020d. Using Satellite Tracking Data to Define Important Habitat for Leatherback Turtles in Atlantic Canada: 2019 Update. Canadian Science Advisory Secretariat Science Advisory Report 2020/041:14.
- DFO (Fisheries and Oceans Canada). 2020e. Recovery Strategy for the Loggerhead Sea Turtle (*Caretta caretta*) in Atlantic Canada. Page vi + 35. Fisheries and Oceans Canada, Ottawa.
- ECCC; Environment and Climate Change Canada. 2022. Management Plan for the Red-necked Phalarope (*Phalaropus lobatus*) in Canada [Proposed]. Page iv + 40. Environment and Climate Change Canada, Ottawa.
- ExxonMobil Canada Ltd. 2015. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024. Report prepared by Amec Foster Wheeler Environment & Infrastructure, St. John's, NL, Canada.
- ExxonMobil Canada Ltd. 2016. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024, Environmental Assessment Addendum and Amendment. Report prepared by Amec Foster Wheeler Environment & Infrastructure, St. John's, NL, Canada.
- ExxonMobil Canada Ltd. 2018a. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024, 2018 Environmental Assessment Update. Report prepared by Amec Foster Wheeler Environment & Infrastructure, St. John's, NL, Canada.
- ExxonMobil Canada Ltd. 2019. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024, 2019 Environmental Assessment Update. Report prepared by Wood Environment & Infrastructure Solutions, St. John's, NL, Canada.
- ExxonMobil Canada Ltd. 2022. Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Programs 2015-2024, 2022 Environmental Assessment Update. Report prepared by Wood Environment & Infrastructure Solutions, St. John's, NL, Canada.
- Government of Canada. 2017. *Species at Risk Act*: order amending schedule 1 (volume 151, number 4, February 22, 2017).
- Government of Canada. 2019. Order Amending Schedule 1 to the Species at Risk Act: SOR/2019-145.
- Government of Canada. 2023. Order Amending Schedule 1 to the Species at Risk Act: SOR/2023-17.
- Husky Energy. 2018. Husky Exploration Drilling Project: Environmental Impact Statement. Report Prepared for Husky Energy. Husky Control Doc No. ED-HSE-RP-0030 File No: 121413837.
- Husky Energy. 2019a. Husky Exploration Drilling Project: Response to Information Requirements and Required Clarifications from Environmental Impact Statement Review. Prepared by Stantec Consulting Ltd. Husky Control Doc No. ED-HSE-RP-0037 File No: 121413837.
- Husky Energy. 2019b. Response to Conformity Review of Information Requirements and Clarifications from Environmental Impact Statement Review. Prepared by Stantec Consulting Ltd. Husky Control Doc No. ED-HSE-RP-0038 File No: 121413837.
- Husky Energy. 2019c. Husky Exploration Drilling Project: Response to Round 2 Information Requirements from Environmental Impact Statement Review. Prepared by Stantec Consulting Ltd. Husky Control Doc No. ED-HSE-RP-0040 File No: 121413837.
- IAAC (Impact Assessment Agency of Canada). 2020. Decision Statement – Jeanne D'Arc Basin

Exploration Drilling Project. Issued under Section 54 of the Canadian Environmental Assessment Act, 2012 to Husky Oil Operations Limited.

RPS. 2019. ExxonMobil Eastern Newfoundland Offshore Exploration Drilling Project: EL 1151 Oil Spill Risk Assessment. Page 109.

RPS. 2022. ExxonMobil Newfoundland – Gale N-66 Modelling Memo. Page 5.

Williams, U. and Chardine, J.W. 1998. The Leach's Storm-Petrel: General information and handling instructions. Unpublished information paper for offshore oil companies. Accessed from <https://www.cnlopb.ca/wp-content/uploads/cggservices/stormpetrel.pdf>.