

REPORT TITLE

**Environmental Assessment Review for 2017
Jeanne d'Arc Basin Flemish Pass Regional Seismic Program 2012-2020**

SUBMITTED TO

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1.0 Introduction

Offshore oil and gas exploration and production programs generally encompass long periods of time and multiple, successive, operational steps. As a consequence, environmental assessments of these programs address a variety of activities undertaken over a number of years.

Annual environmental assessment reviews are conducted to assist the C-NLOPB in fulfilling its responsibilities under the *Canadian Environmental Assessment Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* by ensuring that the scope of the assessment(s) and the mitigations committed to therein remain technically valid.

Table 1 lists Husky Energy's environmental assessment that has been approved by the C-NLOPB for the Jeanne d'Arc Basin Flemish Pass Regional Seismic Program 2012-2020.

Table 1 Current Environmental Assessment Approvals for the New Drill Centre EA

Screening Determination Reference	EA Report Title	Husky Document Number
CEAR No. 11-01-65302	Jeanne d'Arc Basin Flemish Pass Regional Seismic Program 2012-2020	AR-HSE-RP-0110

This EA review will address the Jeanne d'Arc Basin Flemish Pass Regional Seismic Program 2012-2020 only. EA reviews of other activities have been provided separately.

2.0 Jeanne d'Arc Basin Flemish Pass Regional Seismic Program 2012-2020

2.1 Project Description and Scope

2.1.1 Activities Covered

In 2012, Husky Energy proposed to conduct seismic surveys offshore Newfoundland in the region of the Jeanne d'Arc Basin and Flemish Pass (**Figure 2-1**). Husky proposed 2-D, 3-D or 4-D seismic surveys, well site geohazard surveys, and vertical seismic profiling (VSP) surveys in one or more years between 2012-2020 timeframe.

2-D and/or 3-D seismic surveys and well site geohazard surveys were proposed during the spring through fall months, starting as early as 1 March and concluding as late as 30 November. VSP surveys may occur year-round. The timing of the survey is subject to the Proponent's priorities and circumstances, weather and ice conditions, contractor availability and regulatory approvals.

2.1.2 Geographic Scope

In terms of spatial boundaries, the Project Area (**Figure 2-1**) includes areas of interest plus a 10-km buffer area to accommodate the ships' turning radii. The Study Area includes the Project Area plus a 20-km buffer area around the Project Area (**Figure 2-1**) to account for the propagation of seismic survey sound that could potentially affect marine biota. The coordinates of the project area are as follows:

47°40' North and 49°15' West;

47°40' North and 46°30' West;

46° 10' North and 49°15' West; and,

46° 10' North and 46°30' West.



2.1.3 Temporal Scope

Seismic surveying during 2012-2020 may occur anytime between 1 May and 30 November while well site geohazard surveys during that same period may occur anytime between 1 March and 30 November. Vertical seismic profiling surveys may be conducted at any time of the year during 2012-2020.

2.1.4 Planned Activities for 2017

Geophysical and groundtruth data, in the form of high resolution 2D seismic, side scan sonar, sub-bottom profiler, seabed videos and multibeam bathymetric data will be acquired within a 5 by 12.5 km survey area south of the White Rose field in EL 1122 and SDLs 1011 and 1012. (Figure 2-2). The survey will be conducted from the MV Fugro Discovery. Vessel and equipment positioning will be GPS with satellite differential corrections. Survey speed will average 4 knots during the program. The survey systems will be deployed along a regular survey grid, in a manner consistent with C-NLOPB guidelines to provide assurances of safe drilling conditions. The streamer will be towed from the stern of the vessel. A tailbuoy will be used, equipped with a radar reflector and strobe light, as well as a separate GPS tracking system. Streamer depth will be 3 metres and total streamer length will be approximately 700 metres.

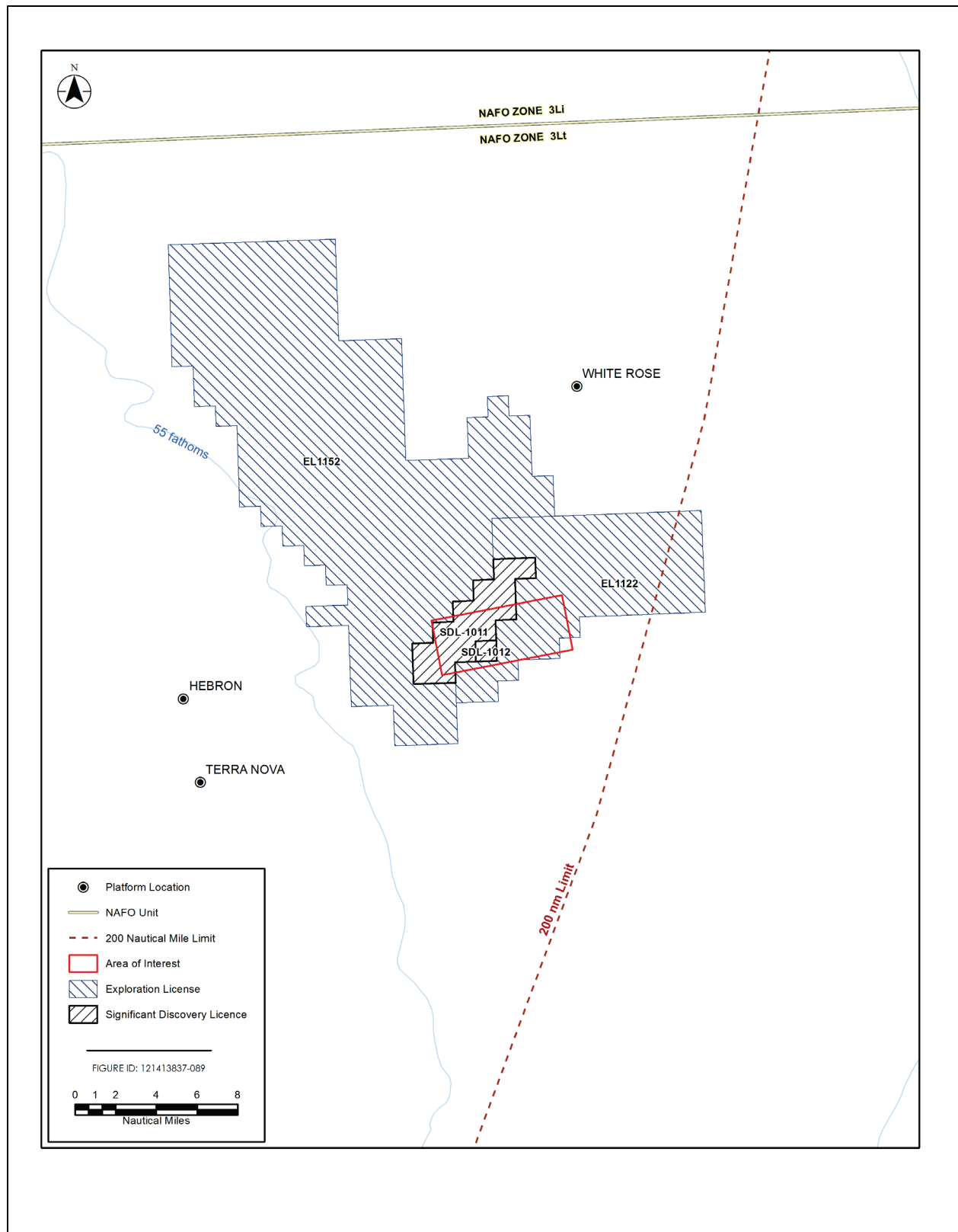


Figure 2-2 Well Site Survey Area

In the event that potential debris is identified by the side scan or multibeam systems, a proton magnetometer will be deployed. This system is towed behind the vessel, 5 to 10m above the seabed, and emits a low power electromagnetic field.

A “groundtruthing” program of seabed video will be conducted at a number of locations. The camera system will be deployed to an elevation of 1 metre or more above the seabed as the vessel drifts or slowly steams across each of the intended locations.

Total time to complete the survey is estimated to be 9 days, starting in early September.

2.2 Environmental Aspects

2.2.1 Fisheries

Very limited, if any fishing activity is expected within the survey area in early September. The snow crab fishery was closed on August 7, 2017. The shrimp fishery in SFA 7 remained closed in 2017. Figure 2-3 summarizes recent fisheries data for August and September.

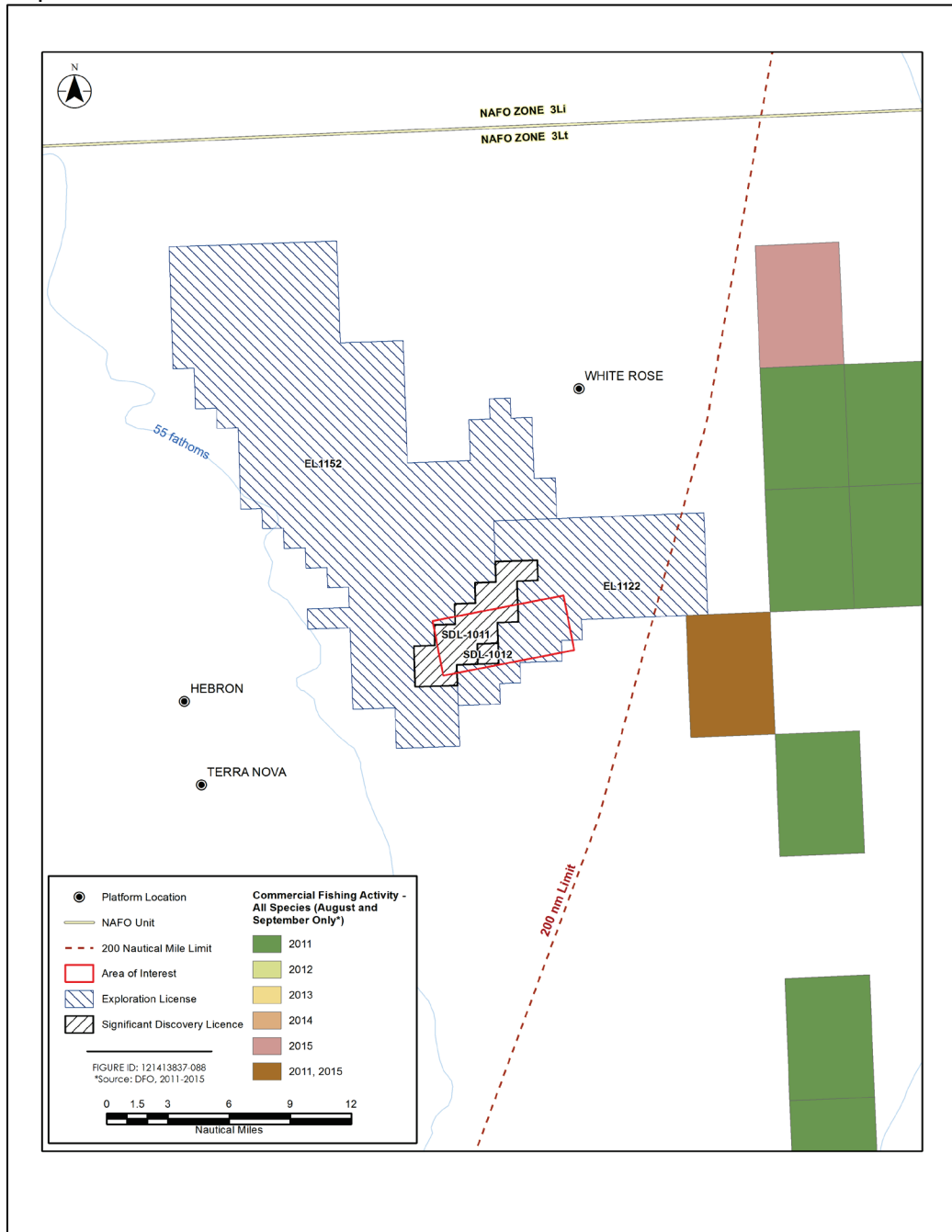


Figure 2-3 Commercial Fishing Activity in August in September from 2011-2015

An invitation to meet with Fishing Industry representatives was sent by email on July 6, along with a summary of the planned schedule and location of the wellsite survey. Requests for further information were received from the Fish, Food and Allied Workers (FFAW) Union and the Association of Seafood Producers (ASP). An email response from One Ocean indicated no concerns. A follow-up email on August 8 to all Fishing Industry representatives confirmed Husky's intent to submit the EA Review for 2017, given that no concerns had been heard.

As noted in previous updates, a directed fishery for American plaice and Atlantic cod has not existed for some time and this has not changed as of 2017. If in the future, a directed fishery is authorized, previous fishing patterns for these species may be re-established in areas in and near the Jeanne d'Arc basin.

Husky understands that it is important to recognize that harvesters fish a resource, and not fixed points from year to year. Licenses are issued for large areas (e.g. NAFO subdivisions 3K or 3L) and fishing activity could take place anywhere within these areas and not just at the pattern of locations fished in recent years indicated by DFO data. Hence this requires that Husky continue to consult with the fishing industry on a regular basis to keep up-to-date with trends in fishing from year to year.

With regard to the conduct of its operations, Husky will continue to keep fishing interests informed of these activities during the operational planning phases. This will be done through the established One Ocean contacts and others as deemed necessary or as advised.

Since the approval of the aforementioned environmental assessment, the fishing and oil and gas industries, through One Ocean, have completed two initiatives to help enhance communication and collaboration between the two industries. The first is a communication protocol that has been distributed to fishers and members of the petroleum industry. The protocol recommends communication procedures between fish harvesters and offshore installations and petroleum-related vessels during operational activities. The second is a risk-based decision matrix that defines the conditions under which oil and gas operators could employ either or both a Fisheries Liaison Officer or a guide vessel in support of certain oil and gas operations that have a potential to affect fisheries activities offshore.

2.2.2 Species at Risk

An updated listing of SARA and COSEWIC species for the Grand Banks area of relevance to this assessment is provided in Appendix 1. SARA-listed species with final recovery strategies in place are noted. None of the SARA-listed species relevant to the spatial scope of this assessment has an overlapping critical habitat description or an action plan in place. Appendix 1 also provides the updated COSEWIC candidate species under consideration.

There are two cetacean species (blue whale, and North Atlantic right whale), one sea turtle species (leatherback), one seabird species (Ivory Gull), and three fish species (white shark, northern wolffish and spotted wolffish) that are legally protected under Schedule 1 of SARA and have potential to occur in the Study Area. Atlantic wolffish, the Atlantic population of fin whales and Sowerby's beaked whale are designated as special concern on Schedule 1 of SARA.

Final recovery strategies are in place for the Ivory Gull, leatherback sea turtle, spotted wolffish, northern wolffish, blue whale and North Atlantic right whale. A management plan has also been prepared for the Atlantic wolffish, currently designated as special concern on Schedule 1 of SARA.

None of the recovery plans for SARA-listed species in place materially change the mitigation measures currently committed by Husky for the scope of the operations addressed by the environmental assessment because critical habitat has not yet been identified within the Study Area.

2.2.3 Mitigations

Husky regards the environmental predictions and consequent mitigations cited in the environmental assessment and subsequent significance determination that relates to CEAR No. 11-01-65302 as still valid and re-commits to implementing these mitigation measures for the activities to be carried out under the scope of this assessment this year.

The lack of fishing activity in the area during the survey does not warrant a dedicated fisheries liaison officer (FLO) or a guide vessel, as per the One Ocean Risk Management Matrix Guidelines (<http://www.oneocean.ca/pdf/Matrix.pdf>).

The C-NLOPB's Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2017) will be used as the basis for the marine mammal monitoring and mitigation program for the seismic surveys. Dedicated marine mammal observers (MMOs) will monitor for marine mammals (and sea turtles if present) and implement mitigation measures as appropriate. The airgun array will be ramped up, and ramp ups will be delayed if a marine mammal is detected within the appropriate safety zone (minimum of 500 m as noted in Fisheries and Oceans Canada Statement of Canadian Practice). The airgun array will be shut down any time an Endangered or Threatened (as listed on Schedule 1 of SARA) marine mammal (or sea turtle) is detected within the safety zone. These measures are designed to minimize disturbance to marine life, particularly marine mammals and species considered at risk under the SARA. In addition, the MMOs will conduct a monitoring and release program for seabirds which may strand on board the seismic vessel.

The potential environmental effects of drilling activities as described in Section 2.1.4 are assessed to be *not significant* when evaluated against the assessment definitions and criteria applied to the valued ecosystem components addressed in the original assessment.

3.0 Concluding Statement

The activities Husky plans to carry out in 2017 have been reviewed and assessed to be within the spatial and temporal scope of the environmental assessments referenced herein.

The environmental effects predicted in the currently valid assessments are still valid. Husky reaffirms its commitment to implement the mitigation measures proposed in these assessments and in the Screening Decisions made by the C-NLOPB.

4.0 References

4.1 Original Husky Environmental Assessments

1. LGL Limited. 2012. Environmental Assessment of Husky's Jeanne d'Arc Basin/Flemish Pass Regional Seismic Program, 2012-2020. LGL Rep. SA1144. Prepared by LGL Limited in association with Canning & Pitt Associates Inc., St. John's, NL, and Oceans Ltd., St. John's, NL, for Husky Energy, St. John's, NL. 320 p. + appendices.
2. LGL Limited. 2006c. Husky White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment. LGL Rep. SA883. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 299 p. + App.
3. LGL Limited. 2007. Husky White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment Addendum. LGL Rep. SA883a. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 126 p. + App.
4. LGL Limited. 2007. Husky Delineation/Exploration Drilling Program for Jeanne d'Arc Basin Area, 2008-2017, Environmental Assessment. LGL Rep. SA935. Prepared by LGL, St. John's, NL, in association with Canning & Pitt Associates, Inc., Oceans Ltd., and PAL Environmental Services. Prepared for Husky Energy Inc., Calgary, AB. 231 p. + Appendices.
5. Husky Energy. 2012. Husky Energy East Coast Operations Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2010. Doc. No. WR-HSE-RP-1886.
6. Husky Energy. 2001. White Rose Oilfield Comprehensive Study Report.

4.2 Other References

1. Husky (Energy). 2016. Amendment to the Husky White Rose Drill Centre Environmental Assessment. Rep. No. WR-HSE-RP-4706. 10 p.
2. Stantec. 2010. Hebron Project Comprehensive Study Report. Prepared by Stantec Ltd. on behalf of ExxonMobil Canada Properties

4.3 Species at Risk Recovery Strategies

- DFO. 2013. Report on the progress of implementation of the Recovery Strategy for northern wolffish (*Anarhichas denticulatus*) and spotted wolffish (*Anarhichas minor*), and Management Plan for Atlantic wolffish (*Anarhichas lupus*) in Canada for the period 2008-2013. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa. vi + 16 p.
- DFO. 2012. Assessment of Leatherback Turtle (*Dermochelys coriacea*) Fishery and Non-fishery Interactions in Atlantic Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/041.
- Environment Canada. 2013. Recovery Strategy for the Ivory Gull (*Pagophila eburnea*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv+ 22 pp.
- Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.
- DFO. 2008. Recovery Strategy for the Atlantic walrus (*Odobenus rosmarus rosmarus*), Northwest Atlantic population, in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, ON. x + 11 pp.
- Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., Savaria, J.-Y., 2009. Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. 62 pp.
- Brown, M.W., Fenton, D., Smedbol, K., Merriman, C., Robichaud-Leblanc, K., and Conway, J.D. 2009. Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters [Final]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada. vi + 66p.

5.0 Appendices

Appendix 1 - Current Listing of SARA and COSEWIC Listed Species in the Husky Project Areas.

Appendix 1: Current SARA¹ Listed and COSEWIC Assessed Species² in the Husky Project Areas

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exploration Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Birds											
Ivory Gull	<i>Pagophila eburnea</i>				1			X			
Marine Fish											
White shark (Atlantic population)	<i>Carcharodon carcharias</i>				1			X			
Northern wolffish ⁴	<i>Anarhichas denticulatus</i>					1			X		
Spotted wolffish ⁴	<i>Anarhichas minor</i>					1			X		
Atlantic wolffish	<i>Anarhichas lupus</i>						1			X	
Atlantic cod	<i>Gadus morhua</i>						3				
Atlantic cod (NL population)	<i>Gadus morhua</i>							X			

¹ Current as of 15 February 2017. Sources: SARA website (<http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>) and COSEWIC website (http://www.cosepac.gc.ca/eng/sct5/index_e.cfm), accessed 15 February 2016. The following species, previously included in Appendix 1 of the 2015 EA Update as High and Mid Priority Candidate species, respectively, are no longer being considered by COSEWIC and were removed from the table: Northwest Atlantic lumpfish (*Cyclopterus lumpus*) and spinytail skate (*Bathyraja spinicauda*).

² Green shade means a final Recovery Strategy is in place but no Critical Habitat has been identified nor have Action or Management plans been finalized for these species with the exception of Atlantic wolffish (Management Plan), and North Atlantic right whale and northern and spotted wolffishes (Critical Habitat; see footnote 4). Note that two other species that have recovery strategies, Atlantic walrus and grey whale, have been extirpated from Eastern Canadian waters and therefore are not listed in the above table.

³ Candidate COSEWIC species are classified as High (H), Medium (M), or Low (L) Priority Candidate (PC) species.

⁴ A critical habitat statement exists for North Atlantic right whale; however, the critical habitats are near Nova Scotia and extend south into the U.S., well outside of the Study Areas. Critical habitat for northern and spotted wolffishes in Newfoundland and Labrador waters and the Gulf of St. Lawrence have been established but not yet published; this critical habitat will be included in the updated Recovery Strategy for these species (DFO 2013).

⁵ Leatherback sea turtle has recently been split into two entries; one with no specific population and the Atlantic population, to reflect the listing for this species as it appears on the SARA website.

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exploration Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Atlantic bluefin tuna	<i>Thunnus thynnus</i>							X			
Porbeagle shark	<i>Lamna nasus</i>							X			
Roundnose grenadier	<i>Coryphaenoides rupestris</i>							X			
Cusk	<i>Brosme brosme</i>							X			
Smooth skate (Funk Island Deep population)	<i>Malacoraja senta</i>	X	X	X				X			
Winter Skate (East Scotian Shelf – NL population)	<i>Leucoraja ocellata</i>	X	X	X				X			
Atlantic salmon (southern NL pop)	<i>Salmo salar</i>								X		
Shortfin mako shark (Atlantic population)	<i>Isurus oxyrinchus</i>								X		
American eel	<i>Anguilla rostrata</i>								X		
American plaice (NL population)	<i>Hippoglossoides platessoides</i>								X		
Acadian redfish (Atlantic population)	<i>Sebastes fasciatus</i>								X		
Deepwater redfish (Northern population)	<i>Sebastes mentella</i>								X		
White hake (Atlantic and Northern Gulf of St. Lawrence population)	<i>Urophycis tenuis</i>								X		
Roughhead grenadier	<i>Macrourus berglax</i>									X	
Smooth skate (Laurentian-Scotian population)	<i>Malacoraja senta</i>									X	
Thorny skate	<i>Amblyraja radiata</i>									X	
Blue shark (Atlantic population)	<i>Prionace glauca</i>									X	
Spiny dogfish (Atlantic population)	<i>Squalus acanthias</i>									X	
Basking shark (Atlantic population)	<i>Cetorhinus maximus</i>									X	
Pollock	<i>Pollachius virens</i>	X	X	X							MPC

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exploration Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Atlantic mackerel	<i>Scomber scombrus</i>										MPC
Greenland shark	<i>Somniosus microcephalus</i>										MPC
American Shad	<i>Alosa sapidissima</i>										MPC
Alewife	<i>Alosa pseudoharengus</i>										MPC
Marine Mammals											
Blue whale (Atlantic population)	<i>Balaenoptera musculus</i>				1			X			
North Atlantic right whale ⁴	<i>Eubalaena glacialis</i>				1			X			
Sowerby's beaked whale	<i>Mesoplodon bidens</i>						1			X	
Fin whale (Atlantic population)	<i>Balaenoptera physalus</i>						1			X	
Harbour porpoise (Northwest Atlantic population)	<i>Phocoena phocoena</i>					2				X	
Humpback whale (Western North Atlantic population)	<i>Megaptera novaeangliae</i>						3				
Killer whale (NW Atl./East Arctic populations)	<i>Orcinus orca</i>									X	
Northern bottlenose whale (Davis Strait/Baffin Bay/Labrador Sea)	<i>Hyperoodon ampullatus</i>									X	
Northern bottlenose whale (Scotian Shelf)	<i>Hyperoodon ampullatus</i>				1			X			
Sei whale (Atlantic population)	<i>Balaenoptera borealis</i>										HPC
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	X	X	X							HPC
Ringed seal	<i>Pusa hispida hispida</i>	X	X	X							HPC
Hooded seal	<i>Cystophora cristata</i>	X	X	X							MPC
Sperm whale	<i>Physeter macrocephalus</i>										MPC
Bearded seal	<i>Erignathus barbatus</i>										MPC

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exploration Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Harp seal	<i>Phoca groenlandica</i>	X	X	X							LPC
Reptiles											
Leatherback sea turtle (Atlantic population) ⁵	<i>Dermochelys coriacea</i>							X			
Leatherback sea turtle ⁵	<i>Dermochelys coriacea</i>				1						
Loggerhead sea turtle	<i>Caretta caretta</i>							X			