

**Statoil Canada Ltd. - East Coast Operations
Newfoundland & Labrador Offshore Area
Environmental Assessment Review for 2014
Seismic Survey Operations**

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1 Introduction

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

This document is one of a series of annual reviews, committed to by Statoil Canada Ltd. (SCL), on the status and ongoing validity of the environmental assessment (EA) approval(s) in place for SCL's geophysical survey activities in the Newfoundland and Labrador Offshore Area (Table 1). These reviews are intended to assist the C-NLOPB in its regulatory review process by ensuring that both the scope of the assessment and the mitigations committed to therein remain technically valid.

Table 1 - Environmental Assessment Approvals in place for Statoil Geophysical survey programs in 2014

Screening Determination Reference ¹	Temporal Scope	EA Report Title
CEAR No. 11-01-60411	April 1 - Oct 31 of 2011 through 2019	<i>Environmental assessment of Statoil's Geophysical Program for Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019</i>
	April 1 - Oct 31 of 2012	<i>Amendment to the Environmental Assessment of Statoil's Geophysical Program for the Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019</i>

The following sections provide the information necessary to confirm the ongoing validity of the assessment in question or note any changes that need to be addressed.

¹ Follow the link to the C-NLOPB public registry to view the environmental assessments, amendments and regulatory determinations.

2 Environmental Assessment of Statoil's Geophysical Program for Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019.

2.1 Project Description and Scope

2.1.1 Activities Covered

This assessment encompasses the conduct of 2d, 3d, 4d and electromagnetic seismic surveys in the Jeanne d'Arc Basin area. In addition, necessary geo-hazard surveys that are needed prior to the start of individual drilling operations to help ensure the safety of those operations are addressed.

Typically, for 2d, 3d and 4d surveys, up to two 5085 in³ air gun arrays of 24 Bolt airguns each operating at 2000 to 2500 psi could be employed firing alternately with sound source characteristics of 109.9 bar-m (i.e., ~255 dB re 1 μ Pa (0 p)). The arrays will typically be towed at a depth of 5 to 8 meters and operated with a shot point interval of 18 to 25 metres. The assessment also considers the use of vessels to support the survey and a picket vessel(s) to accompany the survey vessel. Streamer configurations (strings of hydrophone sound receivers) may vary from 8 to 14 streamers of 5,000 to 8,000 metres in length.

The 2014 3d survey air gun array is designed for alternating air gun arrays of approximately 5,085 cubic inches each operating at 2000 psi with a source level of 114.6 bar-m (~255.8 dB re 1 μ Pa (p-p)). The shot point interval will be approximately 18.75 meters. The arrays will be towed at 6-9 meters in depth. The streamers used for the 2014 survey will be gel-filled (solid core) floatation type. Twelve (12) streamers of 7,500 meters length will be deployed for the survey with separation of 75 to 150 meters between each. The streamers will be towed at 8 to 50 meters depth.

Geophysical site surveys (i.e., geo-hazard surveys using smaller sound sources and other necessary survey equipment) is needed to conduct a site survey for a drilling location. For this type of survey, typically four or more sleeve airguns of approximately 160 in³ in total volume operating at 2000 psi are used. This array is typically streamed approximately 30 meters behind the stern of the survey vessel at a depth of approximately 3 meters. The maximum output from this array has a peak to peak value of 17.0 Bar-metres equating to 244.6 dB (peak to peak)//1 μ Pa@1m, or 238 dB (zero to peak)//1 μ Pa@1m.

Mitigation procedures implemented during surveys carried out under this program will follow those defined in Appendix 2 of Geophysical, Geological, Environmental and Geotechnical Program Guidelines (CNLOPB 2012), including ramp-up (i.e., soft start) of the airgun arrays, the use of qualified, dedicated Marine Mammal Observer(s) (MMOs) to monitor marine mammals and turtles and implement shut downs of the surveys when appropriate, and the use of a Fisheries Liaison Officer (FLO) and communication procedures to avoid conflicts with fishery. Seabird observations will also be carried out by qualified personnel as required in the above-referenced guidelines.

The Statoil 2011-2019 geophysical program environmental assessment and addendum also provides for the conduct of electromagnetic surveys in the study area – e.g., magnetometer and/or controlled source electromagnetic surveys.

2.1.2 Geographic Scope

The geographic scope of the environmental assessment, designed to encompass sufficient area to conduct seismic surveys over SCL's current land interests in the Jeanne d'Arc Basin, is shown in Figure 1. The Project Area within which survey activities are planned to take place is encompassed by Study Area, which is sized to accommodate a potentially affected area 25 kilometers outside the Project Area to account for attenuation of sound energy from an air gun array operating in the Project Area

2.1.3 Temporal Scope

This original environmental assessment was prepared to cover the years 2011 through 2019. Within any one year, large area seismic surveys were anticipated to occur from April through the end of October inclusive. Geohazard surveys could occur at any time during the year.

2.1.4 Planned activities for 2014

In 2014 SCL plans to undertake a 3-D seismic survey over the area(s) shown in Figure 1 over an estimated 70 day period between June and October 2014. The survey area will cover approximately 2570 square kilometers (Figure 1) including area for end of line turns. For this survey, seismic data will continue to be acquired during the turns.

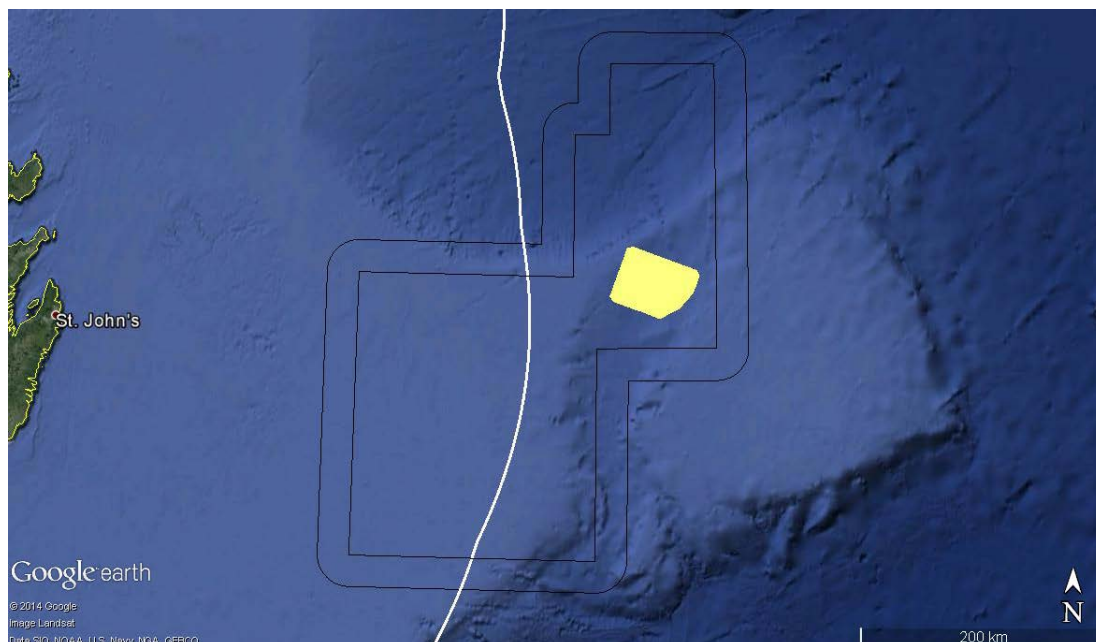


Figure 1: 2014 survey area – yellow polygon within environmental assessment boundaries

In addition to the plans for a 3-D seismic survey in the area described above, SCL may also conduct gravity and magnetic data acquisition during the seismic survey by streaming additional recording equipment immediately behind the survey vessel.

2.2 Environmental Aspects

2.2.1 Commercial Fisheries

Fishing activities in the study area have not changed significantly since the environmental assessment report (c.f. Table 1) was accepted and the overall program approved.

Figure 2 provides a map of 2012 fishing activity information that depicts the overall patterning of fishing activities for all commercial species. This pattern of activity is consistent with that documented in the original environmental assessment and subsequent updates and recent environmental assessments by other offshore operators that have geographic and temporal scopes for their operations that overlap SCL's. The map is based on information derived from Fisheries and Oceans databases including research vessel and underutilized species information.

Figures 3 and 4 show the patterns of fishing activity for Snow Crab and Northern Shrimp in 2012. The pattern of activity shown for these species which are currently the most important commercial species fished in the Study Area is consistent with the long term fishing patterns for both these species as documented in the original environmental assessment and updates and other environmental assessments for this area.

The nearest record of fishing activity for Snow Crab in 2012 was approximately 50 km distant from the westerly extent of the proposed seismic survey area (Figure 4). As shown in Figure 2 however, the bulk of Snow Crab fishing activity is significantly further away along the continental shelf break. Similarly, while the nearest record for the mobile Northern Shrimp fishery is at least 12 kilometers distant from the most westerly boundary of the seismic survey area (Figure 5) the bulk of Northern Shrimp fishing activity occurs in the "shrimp triangle" inside the Canada's Exclusive Economic Zone.

The closest sampling location for the annual post-season crab survey, which takes place at the same sampling locations each year from September through November, is over 90 kilometers distant from the most westerly extent of the proposed 2014 survey operations (Figure 2).

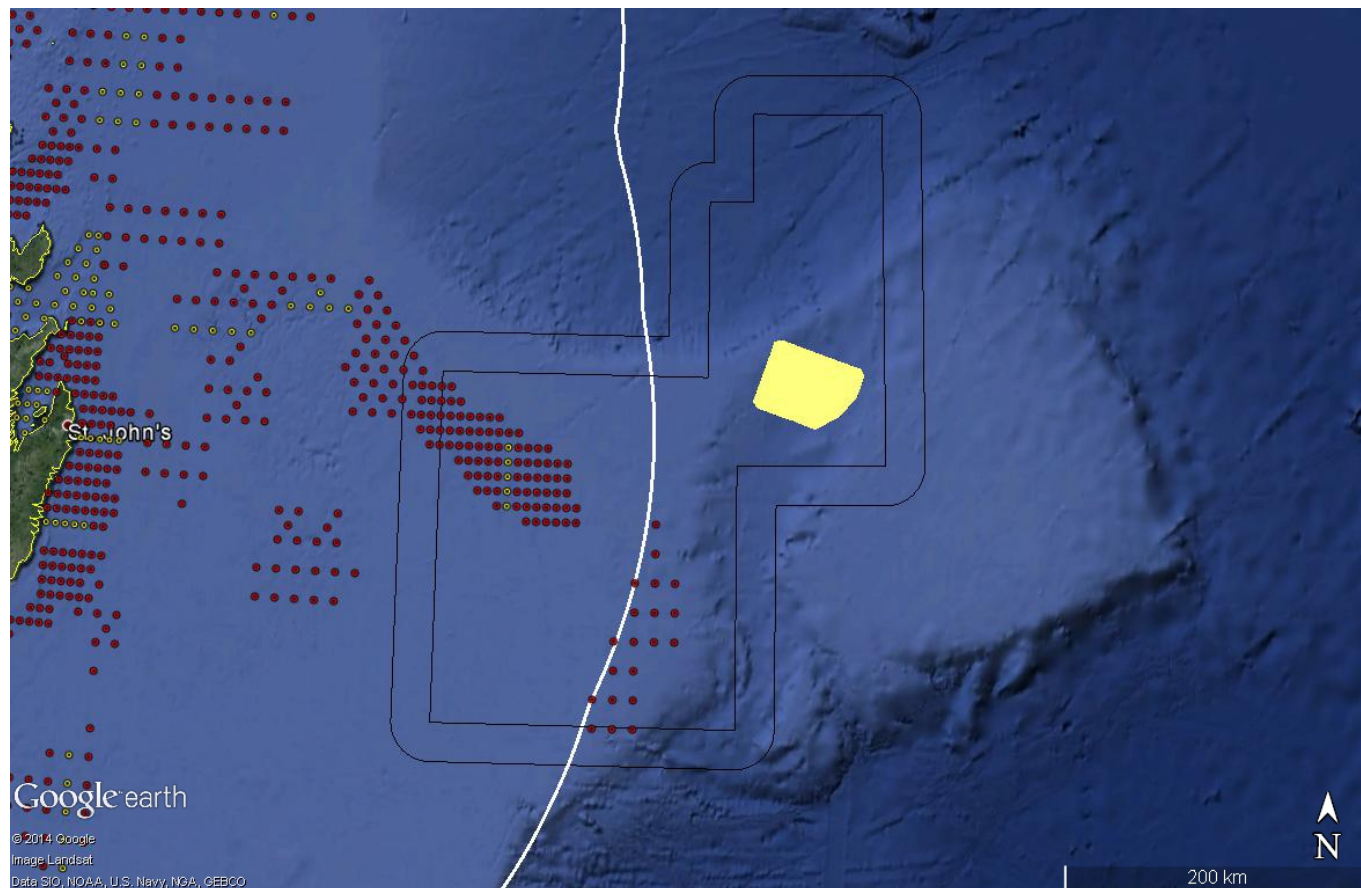


Figure 2: Survey Area relative to Post Season Crab Survey Sample Points

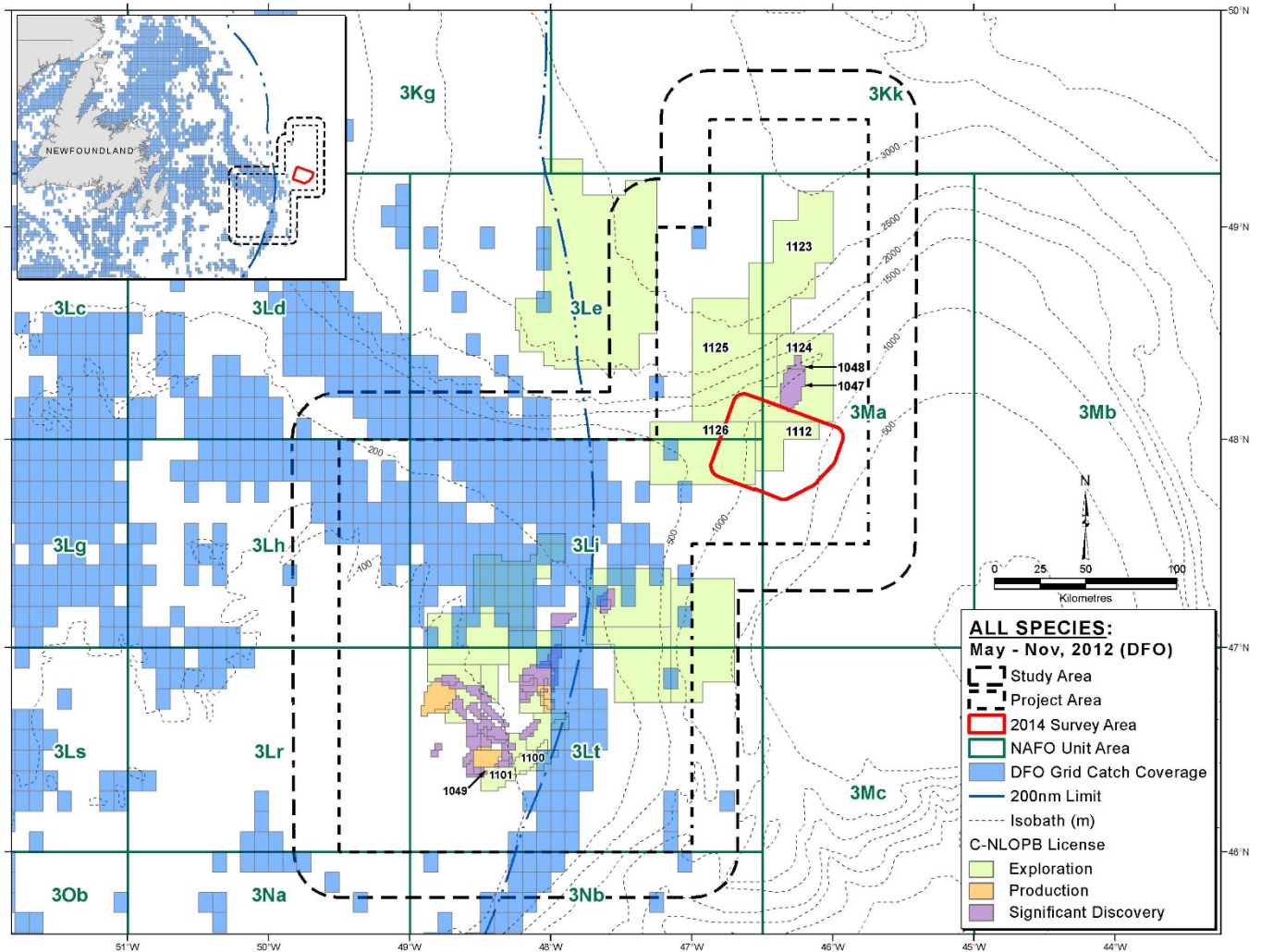


Figure 3: Distribution of All Commercial Species Fishing Activity May to November 2012

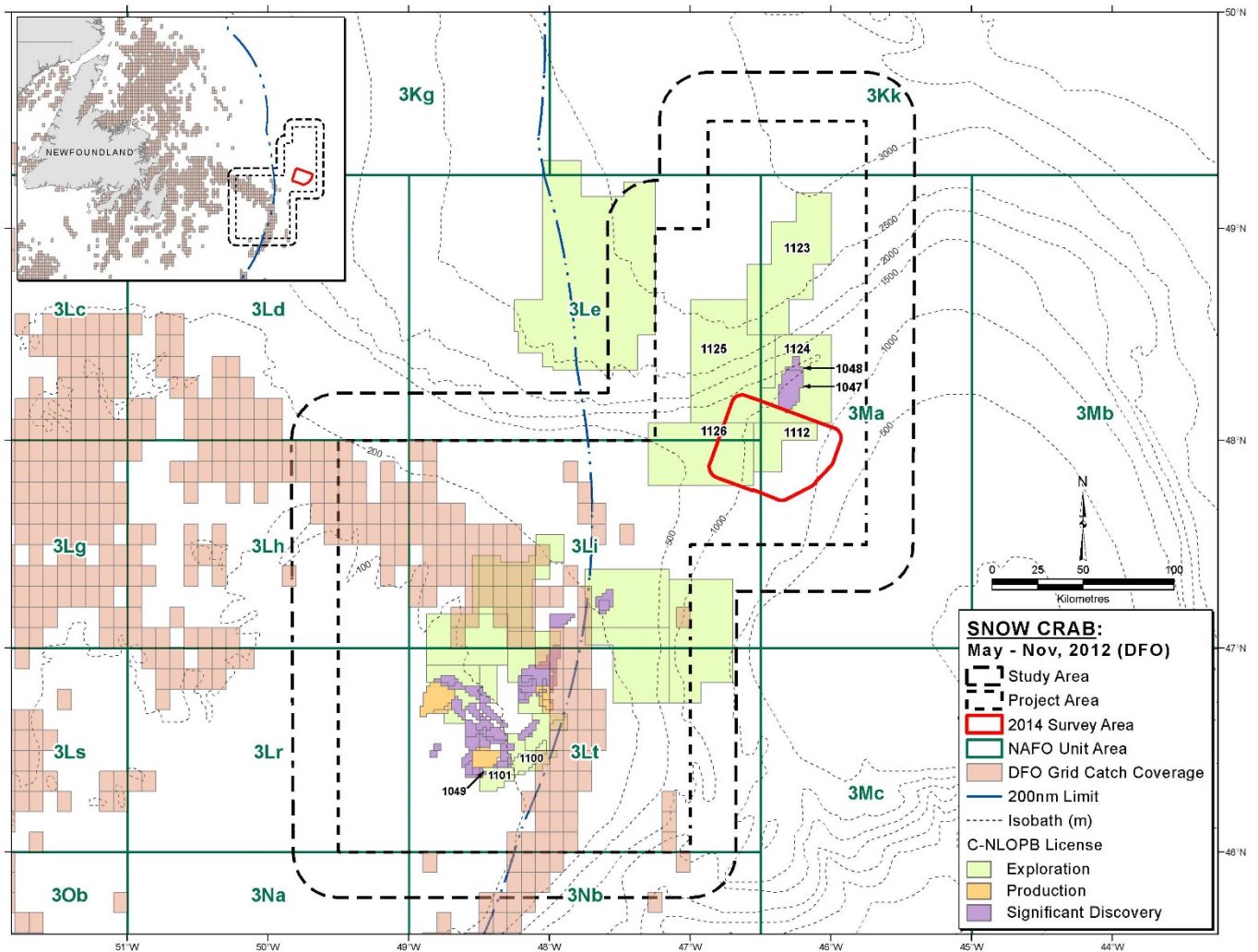


Figure 4: Distribution of Snow Crab Fishing Activity May to November 2012

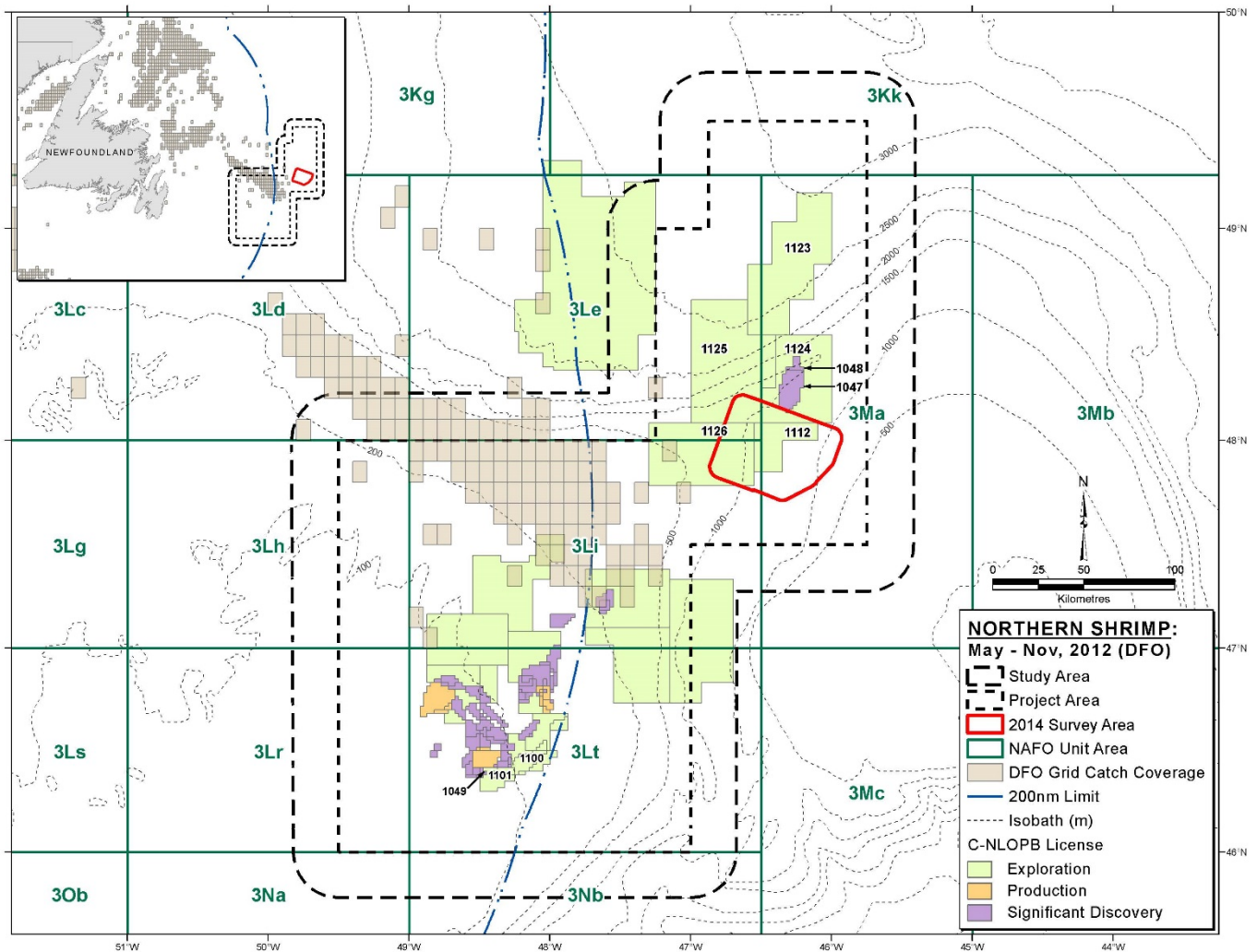


Figure 5: Distribution of Northern Shrimp Fishing Activity May to November 2012

While the general patterning of fishing relevant to this assessment is generally the same over years, the following paragraphs note some points relevant to the interaction between the oil and gas and fishing industry within the scope of this environmental assessment.

SCL recognizes that communication and coordination between oil and gas industry seismic surveys and fishing interests are critical to avoid or minimize interference with either industries' offshore operations. Key to achieving this from SCL's perspective is:

- clear instruction to its contractors with regard to fishing activities and practice in the survey area
- briefing sessions for the main survey contractor and the subcontracted picket vessel personnel
- ensuring clear understanding among survey personnel of the role of the Fisheries Liaison Officer as the sole tactical point of contact between the survey and fishing vessels
- ensuring clear protocols for reporting with respect to any fisheries issues that may arise to SCL, FFAW and the C-NLOPB as well as routine operational reporting
- enhanced frequency of Notices to Shipping to ensure that tactical survey planning is communicated to fishers and other marine interests
- consultation with regard to streamer deployment operations plans prior to the survey and communication of the resulting plan to the C-NLOPB

Consultations relevant to this update took place in January 2014 with Fish Food and Allied Workers Union (FFAW) and Ocean Choice International (OCI) to discuss fishing activities in the survey area(s). A One Ocean² representative participated in SCL's discussions with both the FFAW and OCI. A consultation with Nature NL representatives was held in February 2014.

As the 2014 survey will take place well east of the Snow Crab and Northern Shrimp fishery areas of interest to the FFAW the key issue for the FFAW is the streamer deployment operation. The Snow Crab and Northern Shrimp fisheries will be underway in mid to late May when the survey will start. As planning for the survey progresses SCL will review the streamer deployment operation with the FFAW and communicate the resulting plan to the C-NLOPB. It was agreed that survey operations would not interfere with the post-season crab survey that occurs in September to November each year.

The discussion with Nature NL raised the implications of the survey for cetaceans and corals but did not raise any specific concerns associated with the proposed 2014 survey beyond established mitigation measures for these surveys.

Discussion with Ocean Choice International indicates that they have undertaken more fishing outside the 200 nm in the last two years. The turbot fishery in the survey area will be complete by June 2014 and the redfish fishery will run from May to October 2014. There may also be a cod fishery in the area. A maximum of two OCI vessels will be engaged in these fisheries with the largest of these anticipated to be redfish. OCI provided SCL with a point of contact at OCI to maintain coordination between survey and fishing activities as planning proceeds.

² C.f., www.oneocean.ca

The primary stakeholders affected by SCL's operations sit with SCL on the One Ocean Executive and its Technical Working Group – including the FFAW and OCI as well as other fishing interests. This means that SCL benefits from direct and regular engagement with representatives from the FFAW and seafood producer/processors sectors.

In addition, as indicated in its drilling and other environmental assessments, SCL will continue to engage with stakeholders as circumstances require particularly with respect to tactical planning before and during this and future seismic surveys.

SCL also understands that it is important to recognize that harvesters fish a resource, and not fixed points from year to year. Fishing 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 Fisheries and Oceans data. This means that the operator should continue to consult with the fishing industry on a regular basis to keep up to date with trends in fishing from year to year through mechanisms noted above.

SCL also recognizes that other countries fish outside Canada's 200 nm Exclusive Economic Zone. During past surveys, SCL has encountered communications issues with foreign vessels that resulted in interference with survey operations. In an attempt to minimize mutual interference, SCL has engaged with One Ocean to open a line of communication and coordination through the North Atlantic Fisheries Organization to share survey planning and operations information. It is understood from OCI and others that the issue of seismic surveys generally will be on the agenda for the next NAFO general meeting in Spain in September 2014. Through One Ocean, contacts have been identified within NAFO that have an interest in receiving 2014 survey information and communicating same to its membership to ensure that its members are aware that the survey will be operating in their fishing area in the summer of 2014.

With regards to the conduct of any future geo-hazard or ROV surveys, SCL will continue to keep fishing interests informed of these activities during the operational planning and execution phases. This will be done through the established One Ocean and FFAW contacts and others as deemed necessary or as advised.

2.2.2 *Research Vessel Surveys by Fisheries and Oceans Canada*

Fisheries and Oceans Canada (DFO) undertakes annual fisheries research surveys in the Newfoundland and Labrador Offshore area. Table 2 documents the timing of DFO research surveys that may overlap the 2014 Statoil seismic survey area. SCL will coordinate with DFO on an ongoing basis to determine if overlaps in time and space are likely and what measures are required to manage any potential interactions.

Table 2: Fisheries & Oceans Canada Research Vessel Schedule for NAFO Area Encompassing Statoil Canada 2014 Seismic Survey Area

DFO Research Vessel	NAFO Area Surveyed	2014 Start Date (estimated)	2014 End Date (estimated)
Needler	3L & 3N	15 May	27 May
	3L	28 May	16 June
	3N & 3L	15 Oct	28 Oct
	3L	29 Oct	11 Nov
	3K & 3L	12 Nov	25 Nov
Teleost	3L	6 Apr	10 Apr
	3P & 3KLMNO	11 Apr	29 Apr
	2J & 3KL	30 Apr	9 May
	3KL	10 May	27 May
	3K & 3L Deep	25 Nov	9 Dec

2.2.3 Corals and Sponges

The fish habitat VEC in the current environmental assessment encompassed corals and sponges. Information on these species was provided in the assessment as well as the understanding of their distribution in the project and study areas (c.f. Campbell et al, 2009; DFO, 2010; Kenchington et al, 2010 and NAFO/FC Doc. 11/1). Since that time, additional descriptive information on the Flemish Pass area has been published relevant to corals and sponges (c.f. Froja'n et al 2013 and Beazley et al 2011).

The survey planned for 2014 overlaps segments of two of these NAFO bottom trawling closure areas Area 6 Sackville Spur and Area 10 (Figure 6). However, as the survey does not involve equipment being on or near the sea floor and there is no indication in the literature of damage to corals or sponges arising from seismic survey activities of the nature planned by SCL, the conclusions of the current environmental assessment on this issue remain valid.

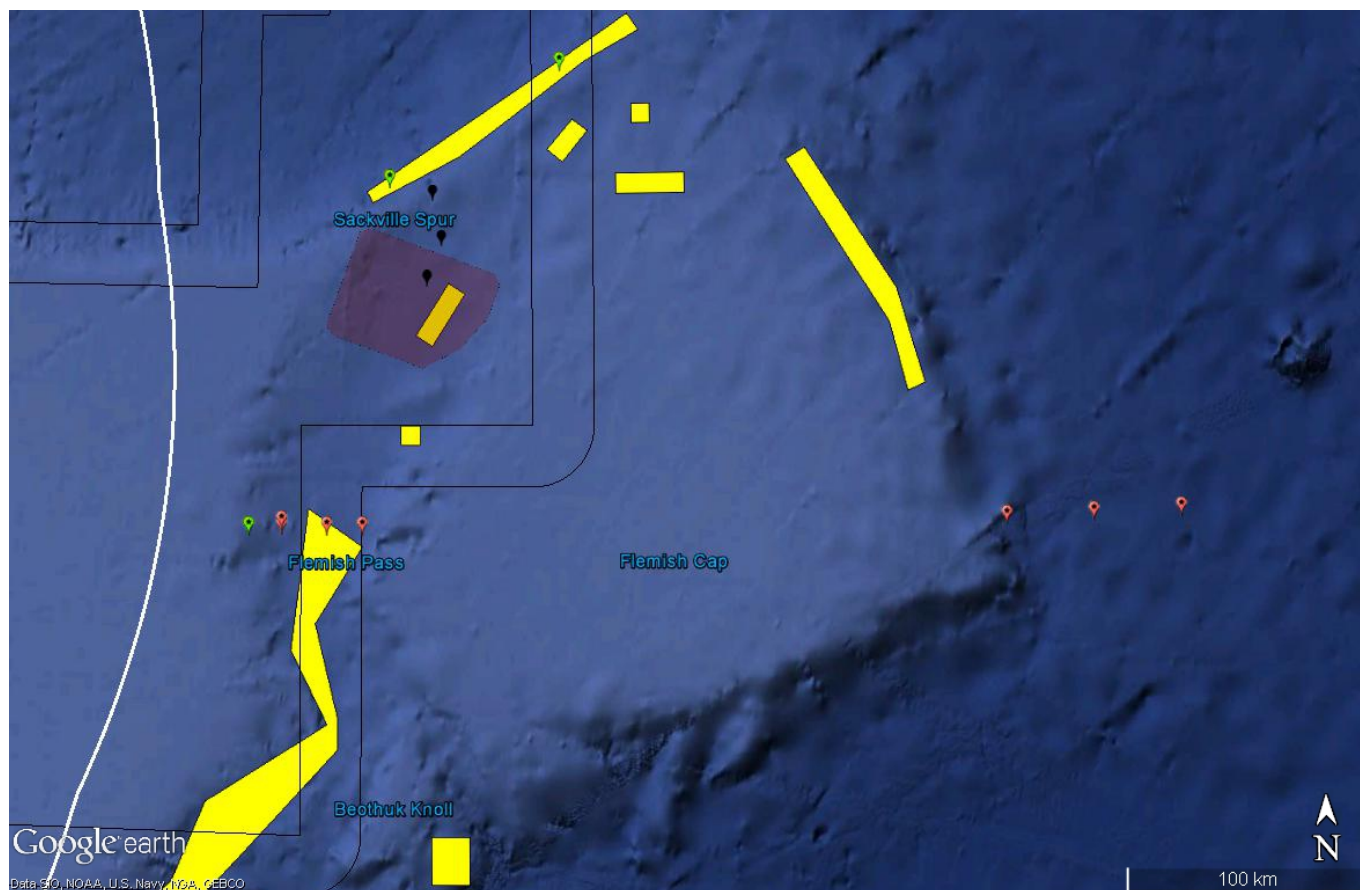


Figure 6: NAFO Fishing Closure Areas (yellow polygons) for Corals & Sponges near and overlapping 2014 seismic survey area. Black, Green and orange balloon icons are locations of current meter arrays proposed for Statoil (black) and existing arrays for Environmental Studies Research Funds (green) and University of Breman (red)

2.2.4 Species at Risk

An updated listing of Species at Risk Act (SARA) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species for the Grand Banks area of relevance to this assessment is provided in Appendix 1. Appendix 1 also provides a listing of COSEWIC candidate species under consideration. SARA listed species with final recovery strategies in place are noted.

None of the SARA listed species relevant to the geographic scope of this assessment have an associated critical habitat description or an action or management plan in place. It is noted however that the North Atlantic Right Whale does have a critical habitat statement pursuant to SARA. However, based on sightings to date, it is an infrequent visitor to the Study Area. Furthermore, the critical habitat designated for this species is located in the Grand Manan Basin in the Bay of Fundy. Similarly, the Leatherback Sea Turtle, which can occur in the Study Area, has had potential but not formally designated critical habitat areas identified in recent years (DFO, 2012). Again, these areas do not occur within the Study Area.

Since the last environmental assessment update, **no species were added to the SARA Schedule 1 listing.** With respect to COSEWIC, four species White Hake (*Urophycis tenuis*), Thorny Skate (*Amblyraja radiata*), Greenland Shark (*Somniosus microcephalus*), Bearded seal (*Erignathus barbatus*) were added since the last environmental assessment update (Appendix 1).

A review of the SARA species-specific recovery plans and the one critical habitat statement in place, as noted in Appendix 1, does not indicate that any new or modified mitigation measures are required beyond those already committed to by SCL for the scope of the operations addressed by the environmental assessment.

2.2.5 Mitigations

Statoil regards the environmental predictions and consequent mitigations cited in the environmental assessment and subsequent significance determination that relates to [CEAR No. 11-01-60411](#) 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.

3 Concluding Statement

The activities SCL plans to carry out in 2014 have been reviewed and assessed to be within the scope of the environmental assessments currently in place to address those activities, specifically:

- the scope and nature of activities planned and addressed under the approved environmental assessment have not changed;
- the nature of the species at risk in the Project and Study areas have been validated and no new species has been added to Schedule 1 of SARA, however, four new species have been added to the COSEWIC listing. As noted previously in this update, no critical habitats for any of these species defined pursuant to the Species at Risk legislation occur in the Study Area;
- the nature and extent of the fishing activities being undertaken in the Project Area have been validated and have not changed such that project activities pose any potential effects not previously assessed; and,
- the mitigation measures defined and committed to in the environmental assessment are still valid and will continue to be implemented

Statoil continues to consult with stakeholders directly affected by the activities planned under the approved environmental assessment.

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

4 References

4.1 Statoil Canada Ltd. Environmental Assessments³

1. Statoil Canada Ltd., 2012, Amendment to the Environmental Assessment of Statoil's Geophysical Program for the Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019
2. LGL Limited. 2011. Environmental assessment of Statoil's Geophysical Program for Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019. LGL Rep. SA1121. Rep. by LGL Limited, in association with Canning & Pitt Associates Inc., and Oceans Ltd., St. John's, NL, for Statoil Canada Ltd., St. John's, NL. 227 p. + appendices.
3. LGL Limited. 2008. Environmental Assessment of StatoilHydro Canada Ltd. Exploration and Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016. LGL Rep. SA947b. Rep. by LGL Limited, Canning & Pitt Associates Inc., and Oceans Ltd., St. John's, NL, for StatoilHydro Canada Ltd., St. John's, NL. 292 p. + appendices

4.2 Previous Statoil Environmental Assessment Updates

1. Statoil Canada Limited East Coast Operations. Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2013 Drilling Operations
2. Statoil Canada Limited East Coast Operations. Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2012 – Seismic Survey Operations
3. Statoil Canada Limited East Coast Operations. Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2012 – Drilling Operations
4. Statoil Canada Limited East Coast Operations. Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2011 (Drilling Operations)
5. Statoil Canada Limited East Coast Operations. Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2010 (Drilling and Seismic Operations)

4.3 Recent and Relevant Environmental Assessments Reviewed for this Update

1. LGL Limited. 2011. 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.

³ Documents referenced in Sections 4.1, 4.2, 4.3 are accessible on the Canada-Newfoundland & Labrador Offshore Petroleum Board [website](#)

2. LGL Limited. 2012. Environmental assessment of WesternGeco's Seismic Program for Jeanne d'Arc Basin, 2012–2015. LGL Rep. SA1150. Rep. by LGL Limited, in association with Canning & Pitt Associates Inc., and Oceans Ltd., St. John's, NL, for WesternGeco Canada, Calgary, AB. 233 p. + appendices.
3. LGL Limited. 2013. Environmental Assessment of HMDC's 2D/3D/4D Seismic Projects 2013-Life of Field, Newfoundland Offshore Area. LGL Rep. SA1207. Prepared by LGL Limited for Hibernia Management and Development Company Ltd., St. John's, NL. 228 p. + appendices.
4. LGL Limited. 2014. Environmental Assessment MKI Southern Grand Banks Seismic Program, 2014-2018. LGL Rep. SA1250. Rep. by LGL Limited, St. John's, NL for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 254 p. + App.

4.4 Relevant Species at Risk Recovery Strategies Reviewed for this Update⁴

1. Atlantic Leatherback Turtle Recovery Team 2006. Recovery Strategy for Leatherback Turtle (*Dermochelys coriacea*) in Atlantic Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, vi + 45 pp.
2. 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.
3. DFO (Fisheries and Oceans Canada). 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.
4. 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.
5. 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.
6. Department of Fisheries and Oceans Canada. 2010. Recovery Strategy for the Northern Bottlenose Whale, Scotian Shelf population, in Atlantic Canadian Waters. .Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada. vi + 61p.
7. DFO. 2011. Using Satellite Tracking Data to Define Important Habitat for Leatherback Turtles in Atlantic Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/036.

⁴ Documents referenced in Section 4.4 are available on the Environment Canada Species at Risk [website](#)

8. O'Boyle, R. 2012. Assessment of Leatherback Turtle (*Dermochelys coriacea*) Fisheries and Non-Fisheries Related Interactions in Atlantic Canadian Waters. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/063. iii + 99 p.
9. Fisheries and Oceans Canada. 2013. Report on the Progress of Recovery Strategy Implementation for the Leatherback Sea Turtle (*Dermochelys coriacea*) in Canada for the Period 2007-2012. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa.
10. Environment Canada. 2014. Recovery Strategy for the Ivory Gull (*Pagophila eburnea*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv+ 21 pp.

4.5 Other References

1. Northwest Atlantic Fisheries Organization Conservation and Enforcement Measures NAFO/FC Doc. 11/1 Serial No. N5867 – Article 16 “Coral and Sponge Protection Zones” (updated 29 July 2011) <http://www.nafo.int/fisheries/frames/regulations.html>
2. Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M., and Wareham, V. 2010. Delineating Coral and Sponge Concentrations in the Biogeographic Regions of the East Coast of Canada Using Spatial Analyses. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/041. vi + 202 pp..
3. Campbell, J.S. and Simms, J.M. 2009. Status Report on Coral and Sponge Conservation in Canada. Fisheries and Oceans Canada: vii + 87 p. <http://www.dfo-mpo.gc.ca/library/340259E.pdf>
4. DFO. 2010. Occurrence, susceptibility to fishing, and ecological function of corals, sponges, and hydrothermal vents in Canadian waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2010/041. http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/sar-as/2010/2010_041_e.pdf
5. Christopher R. S. Barrio Froja'n, Kevin G. MacIsaac, Andrew K. McMillan, Mari'a del Mar Sacau Cuadrado, Philip A. Large, Andrew J. Kenny, Ellen Kenchington, and Enrique de Ca'rdenas Gonz'a'lez. 2013. An evaluation of benthic community structure in and around the Sackville Spur closed area (Northwest Atlantic) in relation to the protection of vulnerable marine ecosystems. ICES Journal of Marine Science (2012), 69(2), 213–222.
6. Beazley, L. I., Kenchington E. L., Murillo, F. J., and Sacau, M. Deep-sea sponge grounds enhance diversity and abundance of epibenthic megafauna in the Northwest Atlantic. ICES J. Mar. Sci. (2011) 68 (2): 319-332.



Appendices

Appendix 1 - Current Listing⁵ of [SARA](#) and [COSEWIC](#) Listed Species in the Statoil Project Area(s)⁶

Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name		Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁷
Birds									
Ivory Gull	<i>Pagophila eburnea</i>		1			X			
Marine Fish									
Northern wolffish	<i>Anarhichas denticulatus</i>			1			X		
Spotted wolffish	<i>Anarhichas minor</i>			1			X		
Atlantic wolffish	<i>Anarhichas lupus</i>				1			X	
Atlantic cod (Newfoundland & Labrador population)	<i>Gadus morhua</i>					X			
Porbeagle shark	<i>Lamna nasus</i>					X			
White shark	<i>Carcharodon carcharias</i>		1			X			
Roundnose Grenadier	<i>Coryphaenoides rupestris</i>					X			
Cusk	<i>Brosme brosme</i>					X			
American Shad	<i>Alosa sapidissima</i>								MPC
Alewife	<i>Alosa pseudoharengus</i>								MPC

⁵ April 2014

⁶ 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 the North Atlantic Right Whale (see footnote 8). Note that two other species that have recovery strategies, the Atlantic Walrus and Grey Whale, have been extirpated from Eastern Canadian waters and therefore are not listed in the above table.

⁷ Candidate COSEWIC species are classified as High (H), Medium (M) or Low (L) Priority Candidate (PC) species

Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name		Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁷
Capelin	<i>Mallotus villosus</i>								MPC
Haddock	<i>Melanogrammus aeglefinus</i>								MPC
Shortfin mako shark	<i>Isurus oxyrinchus</i>						X		
Blue shark	<i>Prionace glauca</i>							X	
American Eel	<i>Anguilla rostrata</i>						X		
Roughhead grenadier	<i>Macrourus bergsila</i>							X	
White Hake (Atlantic and Northern Gulf of St. Lawrence population)	<i>Urophycis tenuis</i>	■					X		
Bluefin Tuna	<i>Thunnus thynnus</i>					X			
Spiny eel	<i>Notacanthus chemnitzii</i>								MPC
Pollock	<i>Pollachius virens</i>								MPC
Spinytail Skate	<i>Bathyraja spinicauda</i>								MPC
Thorny Skate	<i>Amblyraja radiata</i>	■						X	
Ocean pout	<i>Zoarces americanus</i>								MPC
American Plaice (Newfoundland & Labrador Population)	<i>Hippoglossoides platessoides</i>						X		
Acadian Redfish (Atlantic Population)	<i>Sebastes fasciatus</i>						X		
Deepwater Redfish (Northern Population)	<i>Sebastes mentella</i>						X		
Lumpfish	<i>Cyclopterus lumpus</i>								HPC
Spiny Dogfish	<i>Squalus acanthias</i>							X	
Basking Shark	<i>Cetorhinus maximus</i>							X	
Greenland Shark	<i>Somniosus microcephalus</i>	■							MPC



Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name		Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁷
Marine Mammals									
Blue whale	<i>Balaenoptera musculus</i>		1			X			
Humpbacked whale (Atlantic population)	<i>Megaptera movaeanglia</i>				3				
North Atlantic right whale ⁸	<i>Eubalaena glacialis</i>		1			X			
Fin whale (Atlantic population)	<i>Balaenoptera physalus</i>				1			X	
Killer Whale (NW Atlantic & Eastern Arctic Populations)	<i>Orcinus orca</i>							X	
Sperm whale	<i>Physeler macrocephalus</i>								LPC
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>								MPC
Sowerby's beaked whale	<i>Mesoplodon bidens</i>				1			X	
Northern Bottlenose whale ⁹ (Davis Strait/Baffin Bay/Labrador Sea)	<i>Hyperoodon ampullatus</i>							X	
Harbour porpoise	<i>Phocoena phocoena</i>			2				X	
Hooded seal	<i>Cystophora cristata</i>								MPC
Harp seal	<i>Phoca groenlandica</i>								MPC
Ringed seal	<i>Pusa hispida</i>								HPC
Bearded seal	<i>Erignathus barbatus</i>	■							MPC
Reptiles									
Leatherback sea turtle	<i>Dermochelys coriacea</i>		1			X			

⁸ A critical habitat statement exists for this species however, based on sightings to date, it is an infrequent visitor in the study area considered in this assessment with one sighting of two individuals recorded in the DFO cetacean database. The critical habitat for designated for this species is located in the Grand Manan Basin in the Bay of Fundy.

⁹ This species added at DFO's suggestion given that its general distribution encompasses the North-west Atlantic however apart from a localized population on the edge of the Scotian Shelf the nearest known population is along the northern coast of Labrador and into the Davis Strait.



Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
			Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁷
Loggerhead sea turtle	<i>Caretta caretta</i>					X			
Kemp Ridely's sea turtle	<i>Lepidochelys kempii</i>								LPC