

Environmental Assessment Update of the MKI Southern Grand Banks Seismic Program, 2014–2018

Prepared by



for

Multi Klient Invest AS

&

TGS-NOPEC Geophysical Company ASA

**May 2016
Project No. FA0076**

Environmental Assessment Update of the MKI Southern Grand Banks Seismic Program, 2014–2018

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1.0 Introduction

This document is an Update of the Environmental Assessment (EA; LGL 2014a¹) of Multi Klient Invest AS (MKI) and TGS-NOPEC Geophysical Company ASA (TGS)'s proposed 2014–2018 2-Dimensional (2D) and/or 3-Dimensional (3D) marine seismic program in the Southern Grand Banks area, Newfoundland and Labrador, and its associated Addendum (LGL 2014b²) and Amendments (LGL 2015a³; PGS 2016⁴). In 2016, MKI is proposing to conduct 2D seismic surveying in the Southern Grand Banks Project Area (see Figure 1.1 below). This EA Update document addresses the validity of the EA and its Amendment (Table 1.1) as they pertain to MKI's proposed seismic survey activities in 2016. The EA Update is intended to assist the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in its regulatory review process by demonstrating that both the scope of the assessment and the mitigation measures to which MKI previously committed and implemented remain technically valid for proposed seismic survey operations in 2016. A previous Update associated with this program was prepared in 2015 (LGL 2015b⁵).

Table 1.1 Environmental Assessment Documents for the MKI Southern Grand Banks Geophysical Program, 2014–2018.

Screening Determination Reference	Temporal Scope	EA Document Title
C-NLOPB File No. 45006-020-004	May 1 to November 30, 2014–2018	Environmental Assessment of MKI Southern Grand Banks Seismic Program, 2014–2018 and EA Addendum (LGL 2014a,b) ^a
	May 1 to November 30, 2015–2018	Amendment to the Environmental Assessment of MKI's Southern Grand Banks Seismic Program, 2014–2018 (LGL 2015a) ^b
	May 1 to November 30, 2015	Environmental Assessment Update of the MKI Southern Grand Banks Seismic Program, 2014–2018 (LGL 2015b) ^c
	May 1 to November 30, 2016–2018	Amendment to the Environmental Assessment of MKI's Southern Grand Banks Seismic Program, 2014–2018 (PGS 2016) ^d

Notes:

^a On 24 July 2014, the C-NLOPB made a positive determination on this EA and EA Addendum.

^b On 9 June 2015, the C-NLOPB made a positive determination on this EA Amendment.

^c Originally submitted to the C-NLOPB in April 2015, and finalized in May 2015.

^d This amendment is currently under review.

The following sections provide the information necessary to confirm the validity of the EA and its associated documents (see Table 1.1), including assessment of the potential effects of 2D, 3D and 4D seismic survey activities within the defined Project Area (see Figure 1.1 below) on the following Valued

¹ http://www.cnlopb.ca/pdfs/mkisgbss/mkiea_p1.pdf

² <http://www.cnlopb.ca/pdfs/mkisgbss/reveaadd.pdf>

³ <http://www.cnlopb.ca/pdfs/mkisgbss/reveaamen2.pdf>

⁴ <http://www.cnlopb.ca/pdfs/mkisgbss/eaamen.pdf>

⁵ <http://www.cnlopb.ca/pdfs/mkisgbss/reveaupdate.pdf>

Environmental Components (VECs): Fish and Fish Habitat; Fisheries; Seabirds; Marine Mammals and Sea Turtles; Species at Risk; and Sensitive Areas. This Update also includes new relevant information not included in the EA and its associated documents.

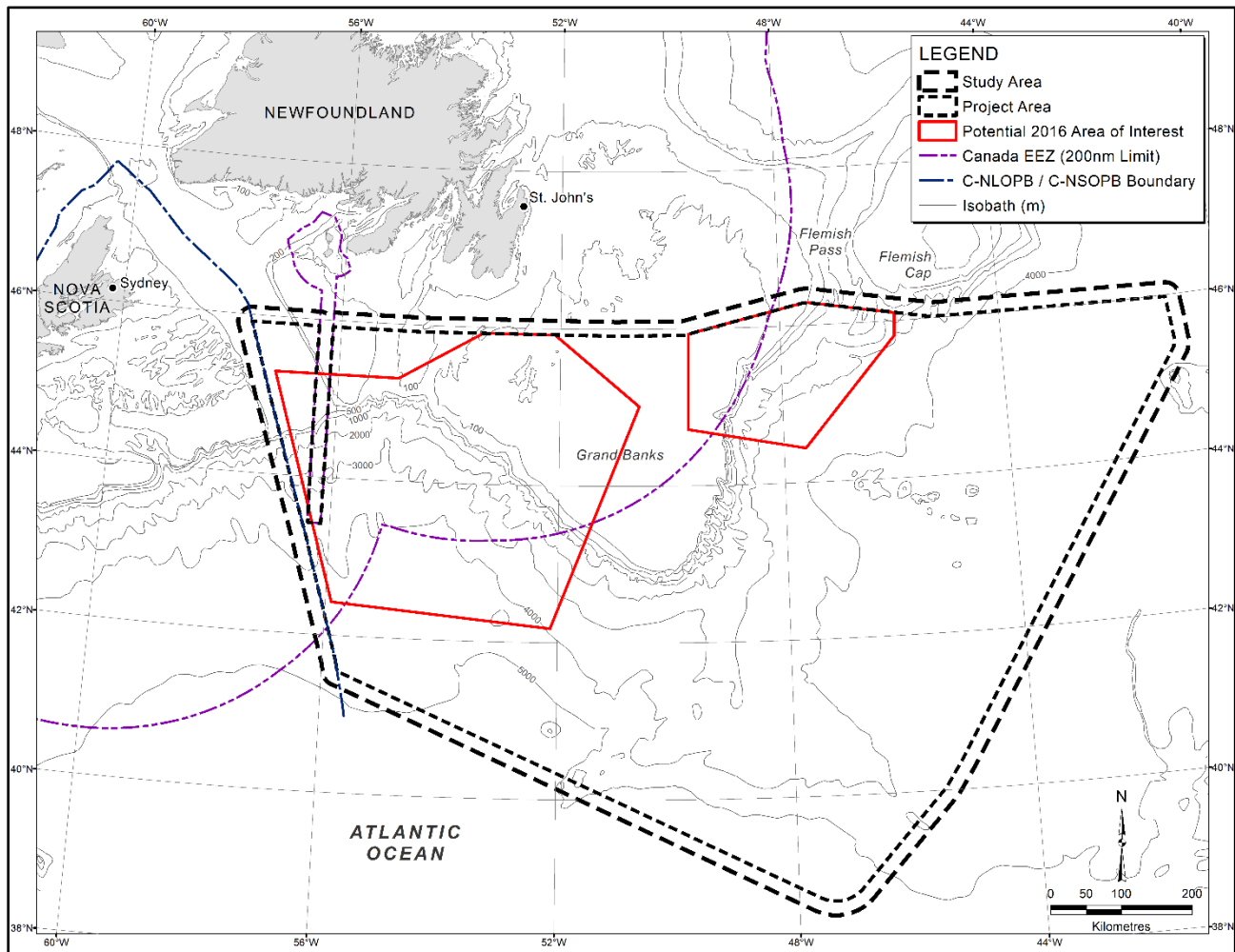


Figure 1.1 Locations of the Project Area, Study Area and 2016 Areas of Interest for MKI's Southern Grand Banks Seismic Program, 2014–2018.

2.0 Project Description

2.1 Vessels and Equipment

In addition to the seismic vessel, 2D and/or 3D seismic surveys require the use of one or more support vessels depending on the type of operation: (1) a dedicated picket/guard vessel will be tasked with communicating with other vessels (primarily fishing vessels) that may be operating in the area, and scouting ahead for any other hazards such as floating debris; and (2) if necessary, a supply vessel tasked with resupply, refuelling and personnel transfer.

The 2D and 3D survey sound sources will consist of one or more airgun arrays with a total discharge volume of 3,000–6,000 in³, operating at a tow depth of 6–15 m. The airgun arrays are comprised of individual airguns ranging in size from 22–250 in³ each. The airguns will be operated with compressed air at pressures of 2,000–2,500 psi and produce approximate peak-to-peak pressures of 100–200 bar-m. A typical airgun array used by MKI for 2D surveys consists of four sub-arrays with a total volume of 4,808 in³, operated at a pressure of 2,000 psi. This array is generally towed at a depth of 9 m and produces peak-to-peak pressures of 179 bar-m. The airguns in the array are strategically arranged to direct most of the energy vertically downward rather than sideways. The shotpoint interval will be one array pulse every 19–25 s, and the survey speed will be around 4.5 knots (8.3 km/h).

For 2D surveys, the seismic ship will also tow a single seismic hydrophone cable (streamer) up to 10 km long, deployed near the ocean surface, at a depth of ~15–25 m. This is a passive listening device, which will receive the sound waves reflected from structures underneath the ocean floor and transfer the data to an on-board recording and processing system. The cable is a solid streamer, PGS GeoStreamer[®]. For 3D seismic surveys, the seismic ship will tow multiple streamers. Streamers will be solid with an expected length of 8,000–10,000 m, depending on survey design, and deployed at depths ranging from ~15–25 m. As many as 16 streamers may be towed during a 3D seismic survey.

The seismic vessel is also equipped with a Furuno FE-700 echosounder. The downward-facing echosounder operates at a frequency of 50 kHz or 200 kHz and will be used to collect water depth information. For this Project, sound velocity profiles will also be acquired in the water column at various locations in the survey area. This is a routine practice during seismic programs. Sound velocity profiles allow for more accurate interpretation of the acoustic data (i.e., seismic pulses) recorded by the seismic streamer. These data are acquired with a small, passive device that will be deployed by the support vessel. The device measures pressure, temperature, and salinity, from which the speed of sound can be calculated.

2.2 Spatial Scope

The Project and Study areas defined in the EA (LGL 2014a) remain unchanged (see Figure 1.1). The Project Area, in which all survey activities will occur, is encompassed by the Study Area. The boundary of the Study Area is 25 km outside of that for the Project Area. The 25 km wide area is intended to account for the propagation of sound being generated in the Project Area that could potentially affect marine biota.

2.3 Temporal Scope

The temporal scope defined in the EA (LGL 2014a) as May 1–November 30 during each year of the 2014–2018 period remains unchanged.

2.4 Seismic Survey Activities Planned for 2016

In 2016, MKI plans to conduct about 18,000 km of 2D seismic surveying in the Project Area. Figure 1.1 shows the areas of focus for the 2D seismic surveying proposed for 2016. An Amendment of the EA (PGS 2016) relating to the use of Inuit MMOs and FLOs during the Southern Grand Banks seismic program is currently under review. Note that the westernmost AOI overlaps the southern portion of the Exclusive Economic Zone of Saint-Pierre et Miquelon. MKI has obtained permission from the French Government to acquire data within its EEZ. MKI is also in communication with the Canada-Nova Scotia Offshore Petroleum Board (C-NSOPB) regarding the proximity of seismic operations to its jurisdiction. MKI has confirmed that its seismic survey will not cross the NL-NS jurisdictional border. All seismic activities, including turning of the vessel and gear, will be conducted in the Project Area.

As was the case in the previous two years, the *MV Atlantic Explorer* (Figure 2.1) will likely be the seismic vessel conducting the 2D seismic surveying in 2016.

All other project details presented in § 2.0 of the EA apply to MKI's seismic survey activities in 2016.



Figure 2.1 *MV Atlantic Explorer.*

2.5 Mitigation Measures

Mitigation measures implemented during seismic surveys carried out under this Project will follow those described in the EA (LGL 2014a,) and its associated documents (LGL 2014b, 2015a,b; PGS 2016) and defined in Appendix 2 of *Geophysical, Geological, Environmental and Geotechnical Program*

Guidelines (CNLOPB 2012). These include ramp-up (i.e., soft start) of the airgun arrays, the use of qualified and experienced, dedicated Marine Mammal Observer(s) (MMOs) to monitor marine mammals and sea turtles and implement shut downs/ramp up delays of the airgun array when appropriate, and the use of a Fisheries Liaison Officer (FLO) and communication procedures to avoid conflicts with fisheries. Seabird observations and monitoring/mitigation for stranded birds will also be carried out by qualified experienced personnel according to established Canadian Wildlife Service (CWS) protocols.

3.0 Physical Environment

A comprehensive report describing the physical environment of the Study Area (i.e., bathymetry, geology, climatology, physical oceanography, and sea ice and icebergs) was prepared for MKI in 2014 (Oceans 2014). A summary of that report was provided in § 3.0 of the EA (LGL 2014a). There have not been any notable changes in the various aspects of the physical environment of the Study Area described in the EA.

4.0 Biological Environment

Background biological environment information not previously included in documents associated with this Project (see Table 1.1) is included in this section.

4.1 Fish and Fish Habitat

New information is included for key points concerning the relationship between planktonic communities and oceanic conditions of the Southern Grand Banks area, as well as for snow crab (*Chionoecetes opilio*), white hake (*Urophycis tenuis*), northern shrimp (*Pandalus borealis*) and Atlantic cod (*Gadus morhua*). The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and associated Amendment (LGL 2015a).

4.1.1 Plankton

The Atlantic Zone Monitoring Program (AZMP) was implemented by the Department of Fisheries and Oceans (DFO) in 1998 in an attempt to better understand, describe and forecast the state of the marine ecosystem. A critical element of the AZMP is an observation program designed to assess the variability in nutrients, phytoplankton and zooplankton (DFO 2015a). The AZMP findings in relation to oceanographic conditions in the Study Area for 2014 are summarized below.

- The Cold Intermediate Layer (CIL) area showed a larger than normal gradient on the Newfoundland and Labrador Shelf. The CIL area on the Grand Banks in spring 2014 was the largest since 1985, and the CIL area in July 2014 was the largest since 1997.
- Chlorophyll anomalies have been below normal on the Newfoundland and Labrador Shelf since 2010, and have demonstrated interannual variability on the Grand Banks in recent years.

- Non-copepod taxa (e.g., larval stages of benthic invertebrates and carnivorous fishes that feed on other zooplankton) demonstrated a considerable increase in abundance on the Grand Banks, appearing to be the continuation of a trend which began in 2004.
- The abundance levels of zooplankton species (e.g., *Calanus finmarchicus*) has been declining steadily over the past five years.
- Overall, the Southern Grand Banks were characterized by above normal nutrient inventories and near normal phytoplankton abundance while nutrient conditions across much of the Newfoundland and Labrador Shelf were below average.

4.1.2 Snow Crab

Offshore snow crab landings in NAFO Div. 3LNO have remained near their highest level (~26,000 t) during 2012–2014. While effort declined considerably from 2011–2013, it increased slightly in 2014. Landings in NAFO Div. 3Ps have declined from a peak of 4,200 t in 2011 to 2,700 t in 2014. Total Allowable Catches (TACs) have not been taken in this area despite effort having increased to a record high level (DFO 2015b).

4.1.3 White Hake

NAFO Div. 3NO landings declined to 205 t and 273 t in 2013 and 2014, respectively. Subdiv. 3Ps white hake landings declined in 2013 to 167 t, but increased to 354 t in 2014 (Simpson et al. 2015).

4.1.4 Northern Shrimp

The catches and estimated biomass of shrimp in Div. 3NO have decreased considerably during the last eight years. In 2015, the biomass decreased by 22% from 2014, representing the lowest level in the survey time series (2001–2015). More than 95% of the biomass in Division 3L was observed in depths <60 m, a developing pattern. Northern shrimp in Div. 3LNO have historically been distributed along the entire edge of the Grand Banks, at depths ranging from 93–550 m (Casas et al. 2015).

4.1.5 Atlantic Cod

According to recent assessments, all Atlantic cod stocks remain at very low levels although spawning biomass has increased in recent years. In 2010, after a decade-long moratorium, a cod fishery on the Flemish Cap (Div. 3M) was re-opened; however the moratoria on directed fisheries continue for Div. 3NO and Div. 3L (NAFO 2014). Recently, the highest estimated biomass of Atlantic cod has been observed in the shallow strata (93–274 m) (Román et al. 2015). During the 2013–2014 season, only 47% of the 11,500 t TAC for 3Ps was landed. The 3Ps stock is currently in the “cautious zone” as defined by the DFO Precautionary Approach Framework (DFO 2015c).

4.2 Fisheries

The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and its associated Amendment (LGL 2015a).

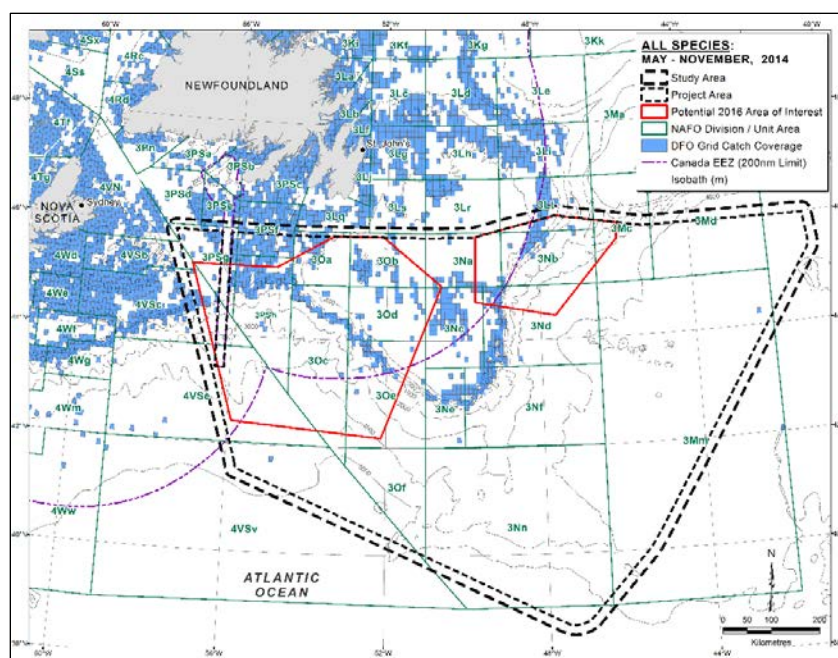
4.2.1 Commercial Fisheries

Results of analyses of the 2014 commercial fisheries landings data did not indicate any major differences in distribution of harvest locations between May–November 2014 (Figures 4.1–4.4) and May–November 2005–2012 and 2013 (see Figures 4.3 to 4.5 in LGL 2014a, and Figure 4.1 in LGL 2015b, respectively). Figures 4.1–4.4 show the distribution of May–November 2014 harvest locations for all species, snow crab, groundfishes and invertebrates, respectively. Most of the harvesting in the Study Area was conducted in areas where water depths were <1,000 m. Harvesting in 2014 was conducted in the northern and southwestern portions of the easternmost 2016 AOI, and in the northern and eastern portions of the westernmost 2016 AOI. As in previous years (see Table 4.2 in LGL 2014a and Table 4.1 in LGL 2015b), snow crab (18% of total catch in the Study Area in terms of total catch weight quartile code counts) accounted for the highest commercial catches in the Study Area during May–November 2014. Other notable species caught commercially in 2014 include Atlantic halibut (*Hippoglossus hippoglossus*) (14%), Atlantic cod (13%), American plaice (*Hippoglossoides platessoides*) (7%), yellowtail flounder (*Pleuronectes ferruginea*) (7%), white hake (6%), haddock (*Melanogrammus aeglefinus*) (5%), whelk (Gastropoda) (4%) and redfish (*Sebastes* sp.) (3%). Catch weight and value quartile counts, months of effort and gear types for species harvested in the Study Area and the 2016 AOI are presented in Tables 4.1 and 4.2, respectively.

As in 2013, yellowtail flounder and redfish accounted for smaller proportions of the 2014 catches compared to previous years. As in previous years, except for 2013, there were reported catches of cockles in the Study Area in 2014. Cockles accounted for a smaller proportion of the catches than in 2005–2010 (see Table 4.2 in LGL 2014a and Table 4.1 in LGL 2015b).

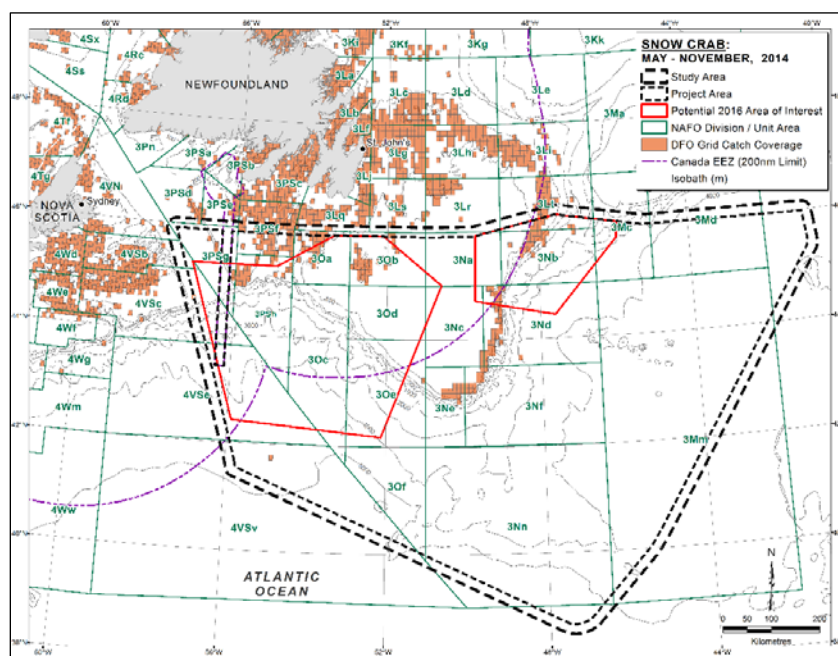
4.2.1.1 Snow Crab

During May–November 2014, the distribution of harvest locations for snow crab in the Study Area was consistent with that observed during May–November 2005–2012 (see Figure 4.2, and Figures 4.10 to 4.12 in LGL 2014a) and May–November 2013 (see Figure 4.2 in LGL 2015b). The catches occurred primarily in the central and northern portions of the Study Area, in areas where water depths <500 m. Catches occurred in the northern and southwestern portions of the easternmost 2016 AOI, and in the northern portion of the westernmost 2016 AOI. The total allowable catch (TAC) for snow crab NAFO Divisions (Div.) 3LNO has increased from 33,222 mt in 2011 to 35,698 mt in 2015, while in Div. 3Ps, the TAC has decreased from 6,727 mt in 2011 to 4,299 mt in 2015 (DFO 2015d).



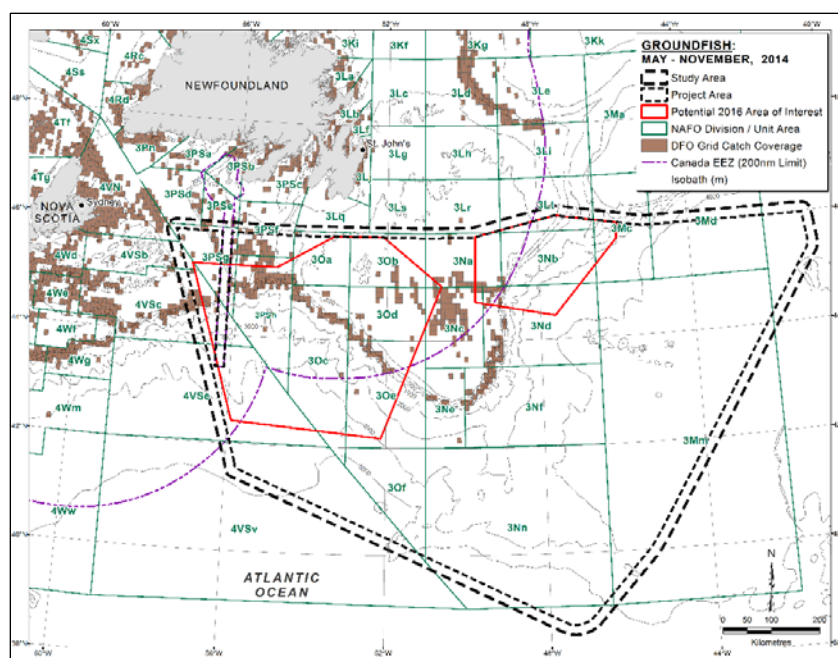
Source: DFO commercial landings database, 2014.

Figure 4.1 Distribution of Commercial Fishery Harvest Locations, All Species, May–November 2014.



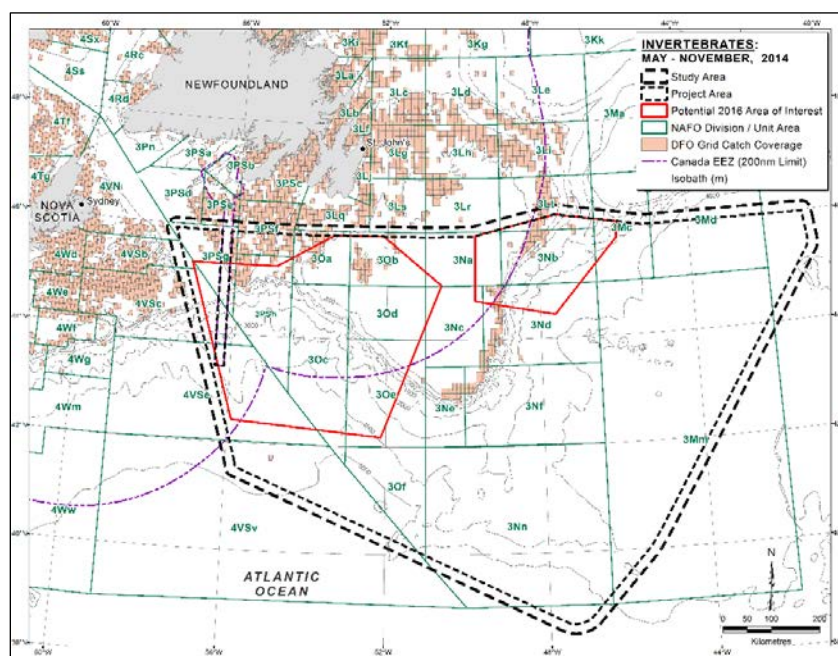
Source: DFO commercial landings database, 2014.

Figure 4.2 Distribution of Commercial Fishery Harvest Locations, Snow Crab, May–November 2014.



Source: DFO commercial landings database, 2014.

Figure 4.3 Distribution of Commercial Fishery Harvest Locations, All Groundfishes, May–November 2014.



Source: DFO commercial landings database, 2014.

Figure 4.4 Distribution of Commercial Fishery Harvest Locations, All Invertebrates, May–November 2014.

Table 4.1 Commercial Catch Weights and Values in the Study Area, May–November 2014
(Values indicate the frequency of catch weight quartile codes [i.e., 1–4] attributed to each species. Gear types and months of effort are also indicated).

Species	Catch Weight Quartile Code Counts ^a				Catch Value Quartile Code Counts ^b				Total Counts ^c	Month Caught	Gear Type	
	1	2	3	4	1	2	3	4			Fixed	Mobile
Snow Crab	113	196	214	40	85	168	225	85	563	May–Aug	Pot	-
Atlantic Halibut	181	133	94	23	156	177	90	8	431	May–Nov	Gillnet; Longline	Trawl
Atlantic Cod	97	137	125	49	135	166	95	12	408	May–Nov	Gillnet; Longline; Pot	Trawl
American Plaice	46	73	78	31	88	84	51	5	228	May–Nov	Gillnet; Longline	Trawl
Yellowtail Flounder	40	70	68	32	80	74	52	4	210	May–Aug; Oct–Nov	Gillnet; Longline	Trawl
White Hake	82	59	44	9	95	80	18	1	194	May–Nov	Gillnet; Longline	Trawl
Atlantic Haddock	25	44	50	20	47	54	34	4	139	May–Nov	Gillnet; Longline	Trawl
Whelk	21	26	52	11	35	45	27	3	110	May–Oct	Pot	-
Redfish	43	37	22	4	58	37	11	0	106	May–Nov	Gillnet; Longline	Trawl
Skate sp.	43	25	22	6	53	30	11	2	96	May–Sep; Nov	Gillnet; Longline	-
Swordfish (<i>Xiphias gladius</i>)	38	25	8	0	21	29	19	2	71	Aug–Oct	Longline	-
Greenland Halibut (<i>Reinhardtius hippoglossoides</i>)	34	19	12	3	26	27	15	0	68	May–Nov	Gillnet; Longline	Trawl
Pollock (<i>Pollachius virens</i>)	8	27	29	4	35	28	5	0	68	May–Nov	Gillnet; Longline	Trawl
Atlantic Wolffish (<i>Anarhichas lupus</i>)	2	17	24	12	10	25	18	2	55	May–Jul	Longline	Trawl
Cusk (<i>Brosme brosme</i>)	30	14	3	0	22	22	3	0	47	May–Aug; Nov	Longline	-
Mako Shark (<i>Isurus oxyrinchus</i>)	20	20	7	0	12	19	14	2	47	Jun–Oct	Longline	-
Witch Flounder (<i>Glyptocephalus cynoglossus</i>)	13	13	12	4	18	16	8	0	42	May–Jun; Oct–Nov	-	Trawl
Monkfish (<i>Lophius</i> sp.)	8	14	10	8	18	13	9	0	40	May–Nov	Gillnet; Longline	Trawl

Species	Catch Weight Quartile Code Counts ^a				Catch Value Quartile Code Counts ^b				Total Counts ^c	Month Caught	Gear Type	
	1	2	3	4	1	2	3	4			Fixed	Mobile
Bluefin Tuna (<i>Thunnus thynnus</i>)	13	7	7	6	10	12	8	3	33	Aug–Nov	Longline	Troller Lines; Rod and Reel (Trolling)
Porbeagle Shark (<i>Lamna nasus</i>)	19	2	0	0	8	13	0	0	21	May–Jul; Sep–Oct	Longline	-
Sea Scallop (<i>Placopecten magellanicus</i>)	1	2	8	4	2	4	5	4	15	Aug–Sep	-	Dredge
Mahi Mahi (dolphinfish) (<i>Coryphaena hippurus</i>)	7	6	2	0	4	5	5	1	15	Aug–Sep	Longline	-
White Marlin (<i>Kajikia albidus</i>)	5	4	1	0	3	2	4	1	10	Aug–Sep	Longline	-
Argentine (<i>Argentina silus</i>)	2	4	4	0	3	7	0	0	10	Aug	-	Trawl
Albacore Tuna (<i>Thunnus alalunga</i>)	3	3	2	0	1	2	4	1	8	Aug–Oct	Longline	-
Bigeye Tuna (<i>Thunnus obesus</i>)	2	3	1	0	1	2	3	0	6	Sep–Oct	Longline	-
Groundfish sp.	0	4	0	0	0	1	3	0	4	Nov	Longline	-
Cockle (Gastropoda)	0	1	1	0	0	1	1	0	2	May; Aug	-	Dredge
Blue Marlin (<i>Makaira nigricans</i>)	2	0	0	0	1	1	0	0	2	Sep	Longline	-
Stimpson's Surf Clam (<i>Mactromeris polynyma</i>)	0	1	1	0	0	1	1	0	2	May; Aug	-	Dredge
Propeller Clam (<i>Cyrtodaria siliqua</i>)	0	1	1	0	0	1	1	0	2	May; Aug	-	Dredge
Quahaug Clam (<i>Arctica islandica</i>)	0	0	1	0	0	0	1	0	1	May	-	Dredge
Total	898	987	903	266	1,027	1,146	741	140	3,054	-	-	-

Source: DFO commercial landings database, 2014.

Notes:

^a Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2014 quartile ranges: 1 = 0 – 2,421 kg, 2 = 2,422 – 10,786 kg, 3 = 10,787 – 42,872 kg, 4 = ≥ 42,873 kg.

^b Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2014 quartile ranges: 1 = \$0 – \$8,851, 2 = \$8,852 – \$38,076, 3 = \$38,077 – \$140,695, 4 = ≥ \$140,696.

^c Total counts of the number of catch records per species; the total quartile code counts for catch weight and catch value are equal.

Table 4.2 Commercial Catch Weights and Values in the 2016 Areas of Interest, May–November 2014 (Values indicate the frequency of catch weight quartile codes [i.e., 1–4] attributed to each species. Gear types and months of effort are also indicated).

Species	Catch Weight Quartile Code Counts ^a				Catch Value Quartile Code Counts ^b				Total Counts ^c	Month Caught	Gear Type	
	1	2	3	4	1	2	3	4			Fixed	Mobile
Easternmost 2016 Area of Interest												
Snow Crab	5	32	37	13	3	28	31	25	87	May–Aug	Pot	-
American Plaice	7	11	7	1	13	8	5	0	26	May–Jul; Nov	-	Trawl
Yellowtail Flounder	7	9	7	1	13	6	5	0	24	May–Jul; Nov	-	Trawl
Atlantic Halibut	2	3	3	0	1	1	5	1	8	May–Jul	Longline	-
Atlantic Cod	0	1	5	1	0	1	5	1	7	May–Jul; Nov	Longline	Trawl
Skate sp.	1	1	0	0	0	1	1	0	2	Jun–Jul	Longline	-
Total	22	57	59	16	30	45	52	27	154	-	-	-
Westernmost 2016 Area of Interest												
Atlantic Halibut	102	55	35	6	89	87	21	1	198	May–Nov	Gillnet; Longline	Trawl
Snow Crab	38	56	62	6	26	54	66	16	162	May–Jul	Pot	-
White Hake	70	47	31	8	80	64	12	0	156	May–Nov	Gillnet; Longline	Trawl
Atlantic Cod	43	46	35	11	57	61	17	0	135	May–Nov	Gillnet; Longline; Pot	Trawl
American Plaice	16	22	23	6	25	29	13	0	67	May–Jun; Aug; Oct– Nov	Gillnet; Longline	Trawl
Atlantic Haddock	19	21	20	5	30	27	8	0	65	May–Nov	Gillnet; Longline	Trawl
Redfish	24	21	15	4	34	25	5	0	64	May–Nov	Gillnet; Longline	Trawl
Yellowtail Flounder	9	23	22	5	19	28	12	0	59	May–Jun; Oct–Nov	Longline	Trawl
Skate sp.	36	13	7	2	40	14	4	0	58	May–Aug	Gillnet; Longline	-
Swordfish	28	19	7	0	16	20	16	2	54	Aug–Oct	Longline	-
Pollock	6	20	23	4	27	22	4	0	53	May–Nov	Gillnet; Longline	Trawl
Mako Shark	18	16	7	0	11	15	13	2	41	Jun; Aug– Oct	Longline	-
Witch Flounder	11	12	11	4	15	15	8	0	38	May–Jun; Oct–Nov	-	Trawl
Cusk	25	11	2	0	15	21	2	0	38	May– Aug; Nov	Longline	-
Greenland Halibut	18	6	7	3	13	17	4	0	34	May–Sep	Gillnet; Longline	Trawl
Monkfish	5	9	6	4	12	8	4	0	24	May–Jul; Nov	Gillnet	Trawl
Porbeagle Shark	16	2	0	0	6	12	0	0	18	May–Jul; Sep	Longline	-

Species	Catch Weight Quartile Code Counts ^a				Catch Value Quartile Code Counts ^b				Total Counts ^c	Month Caught	Gear Type	
	1	2	3	4	1	2	3	4			Fixed	Mobile
Bluefin Tuna	6	3	6	0	3	7	5	0	15	Aug–Oct	Longline	Troller Lines
Mahi Mahi (dolphinfish)	6	6	2	0	3	5	5	1	14	Aug–Sep	Longline	-
White Marlin	5	4	1	0	3	2	4	1	10	Aug–Sep	Longline	-
Albacore Tuna	3	3	1	0	1	2	3	1	7	Aug–Sep	Longline	-
Atlantic Wolffish	0	3	3	1	0	4	3	0	7	May–Jun	-	Trawl
Argentine	2	1	3	0	2	4	0	0	6	Aug	-	Trawl
Groundfish sp.	0	4	0	0	0	1	3	0	4	Nov	Longline	-
Blue Marlin	2	0	0	0	1	1	0	0	2	Sep	Longline	-
Bigeye Tuna	1	1	0	0	0	1	1	0	2	Sep	Longline	-
Whelk	1	0	0	0	1	0	0	0	1	Jun	Pot	-
Total	510	424	329	69	529	546	233	24	1,332	-	-	-

Source: DFO commercial landings database, 2014.

Notes:

^a Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2014 quartile ranges: 1 = 0 – 2,421 kg, 2 = 2,422 – 10,786 kg, 3 = 10,787 – 42,872 kg, 4 = ≥ 42,873 kg.

^b Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2014 quartile ranges: 1 = \$0 – \$8,851, 2 = \$8,852 – \$38,076, 3 = \$38,077 – \$140,695, 4 = ≥ \$140,696.

^c Total counts of the number of catch records per species; the total quartile code counts for catch weight and catch value are equal.

4.2.1.2 Other Notable Commercial Species

As noted in the 2015 EA Update (see § 4.2.1 in LGL 2015b), Atlantic halibut, Atlantic cod, American plaice, yellowtail flounder and redfish have also been identified as important commercial species in the Study Area (see Table 4.1 above, Table 4.3 in LGL 2014a and Table 4.1 in LGL 2015b). These species are harvested primarily in areas where water depths are <500 m (i.e., northwestern and north-central portions of the Study Area; including the northern and southwestern portions of the easternmost 2016 AOI and the northern portion of the westernmost 2016 AOI). Atlantic halibut are managed by DFO, while NAFO sets annual TAC values for the other four species. The 2015 TAC levels for Atlantic halibut in Div. 3NOPs4VWX+5 increased from 2,563 mt in 2015 to 2,738 mt in 2016 (DFO 2015d). Based on relatively high recruitment levels since the mid 2000s, the Atlantic cod and redfish stocks on the Flemish Cap in Div. 3M are currently healthy and likely able to support an increase in catches in 2016 and 2017 (NAFO 2015a,b). The TAC for Atlantic cod in Div. 3M increased from 13,795 mt in 2015 to 13,931 mt in 2016, while in Div. 3Ps, it increased from 13,225 mt in 2015 to 13,490 mt in 2016 (DFO 2015d; NAFO 2016). Redfish TAC remained constant at 10,400 mt in 2015 and 2016 in Div. 3LN, increased from 6,700 mt in 2015 to 7,000 mt in 2016 in Div. 3M, and remained at 20,000 mt in 2015 and 2016 in Div. 3O (NAFO 2016). Unit II redfish in Div. 3Ps remained at 8,500 mt in 2015 and 2016 (DFO 2015d). Fishing bans are in place in Div. 3LNO for Atlantic cod and American plaice, and in Div. 3M and 3Ps for American plaice (DFO 2015d; NAFO 2015a). The TAC for yellowtail flounder remained steady at 17,000 mt in 2015 and 2016 in Div. 3LNO (NAFO 2016).

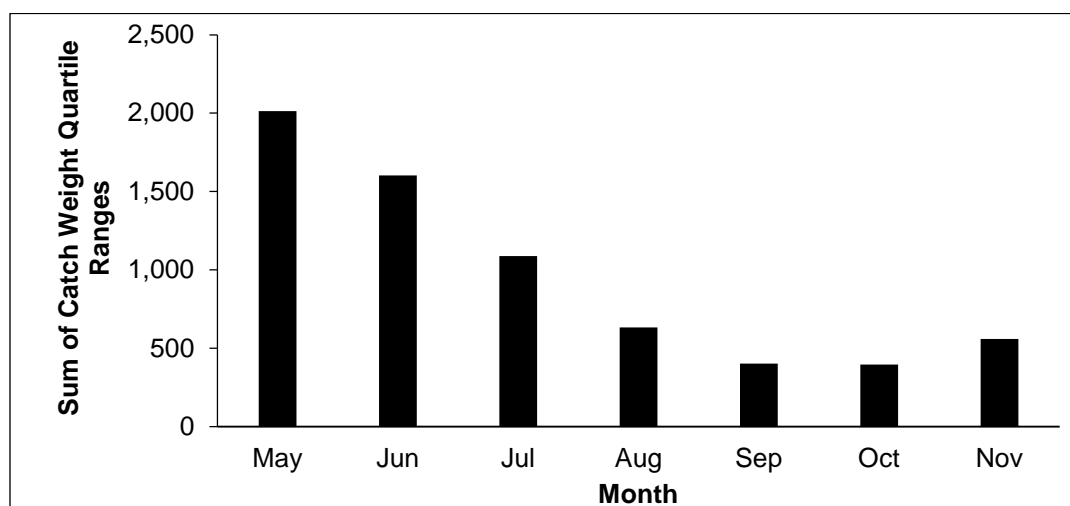
4.2.1.3 Northern Shrimp

As noted in the 2015 EA Update (LGL 2015b), northern shrimp harvesting in the Study Area has declined during recent years. The 2010 moratorium on this fishery in Div. 3M remains in effect, and the

2015 shrimp fishery closure in Shrimp Fishing Area (SFA) 7 (includes Div. 3LN) remains in effect for 2016 (DFO 2015d; NAFO 2015a). No northern shrimp harvests in the Study Area were reported during May–November 2014 (see Table 4.1). Invertebrates harvested during May–November 2013 (e.g., scallops, cockles and clams) were primarily captured in the central and northern portions of the Study Area, in areas where water depths <500 m, including the northern and southwestern portions of the easternmost 2016 AOI, and the northern portion of the westernmost 2016 AOI (see Figure 4.4).

4.2.1.4 Timing and Gear Types

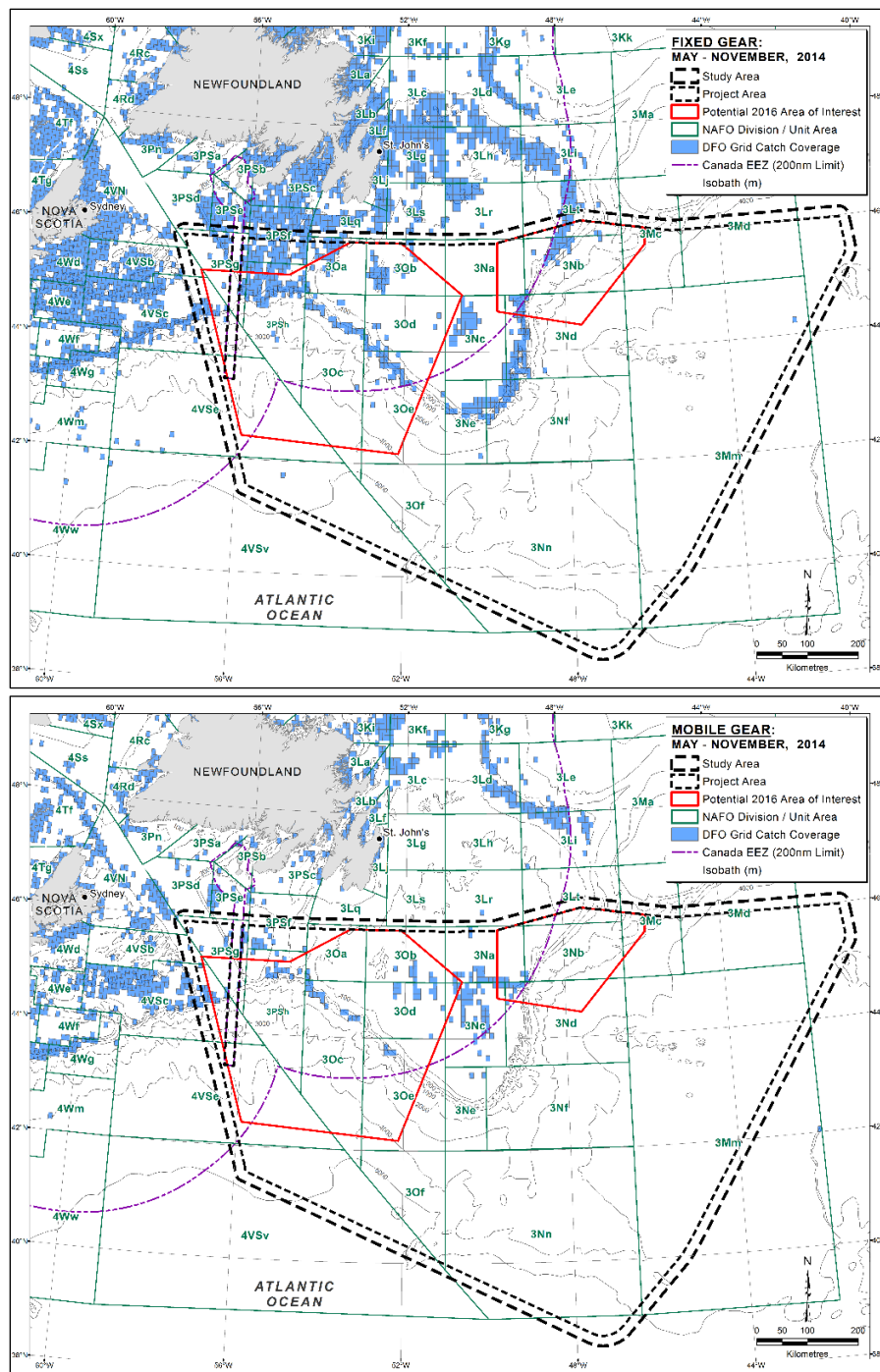
As in previous years, most of the May–November 2014 harvesting in the Study Area occurred during the May–July period (see Figure 4.5 below, Figure 4.8 *in* LGL 2014a, and Figure 4.5 *in* LGL 2015b). Gear types used in the Study Area in 2014 were typical of those used during previous years (see Table 4.1, and Figures 3.19–3.20 and Table 3.5 in the Southern Newfoundland SEA [C-NLOPB 2010]). The 2014 harvest locations for both fixed and mobile gears are shown in Figure 4.6.



Source: DFO commercial landings database, 2014.

Notes: Sum of catch weight quartile codes is the summation of quartile codes (i.e., 1–4) for all catch records for all species; the greater the sum of quartile code counts, the greater the catch weight for a given month.

Figure 4.5 Monthly Sums of Catch Weight Quartile Codes in the Study Area, All Species, May–November 2014.



Source: DFO commercial landings database, 2014.

Figure 4.6 Harvest Locations using Fixed (Top) and Mobile (Bottom) Gears in the Study Area, Project Area and 2016 Area of Interest, All Species, May–November 2014.

4.2.2 Traditional and Aboriginal Fisheries

Several communal commercial fisheries licences (CCFL) are held by Aboriginal groups in the Study Area. The Innu Nation of Labrador holds a CCFL for fixed gear groundfish fishing activity in Div. 3Ps

and 3LMNO. This licence also permits access to shrimp in SFA 6 (includes Div. 3K and a portion of Div. 2J, north of the Study Area) and 7 (D. Ball and D. Tobin, DFO, Resource Management and Aboriginal Fisheries, pers. comm. 3 December 2015). The latest available Canadian Atlantic Quota Report for Atlantic cod, published in 2012, listed the TAC allocated by DFO to the Aboriginal fishery in Div. 3Ps as 27 mt for April 2012–March 2013 (DFO 2013). There is potential for the Mi'kmaq Alsumk Mowimsikik Koqoey Association (MAMKA) to expand from the inshore into Div. 3KL, depending on future management measures for northern cod (D. Ball and D. Tobin, DFO, Resource Management and Aboriginal Fisheries, pers. comm. 3 December 2015).

According to the Southern Newfoundland SEA (C-NLOPB 2010), waters well north of the southwestern portion of the Study Area (in Div. 3Ps; exclusively including coastal, inshore and near shore waters in the vicinity of Conne River, Bay d'Espoir and Hermitage Bay, Newfoundland (D. Ball and D. Tobin, DFO, Resource Management and Aboriginal Fisheries, pers. comm. 3 December 2015) are used by the Conne River Band Council (Miawpukek First Nation Government) for Food, Social and Ceremonial fisheries, along with Communal/Commercial fishing activities. A detailed description of these activities was presented in § 3.3.4 of the Southern Newfoundland SEA (C-NLOPB 2010). The Nunatsiavut Government holds a Communal Snow Crab licence and allocation in Div. 2GHJ, north of 54°40' N, which is north of the Study Area (DFO 2010). The Innu Nation of Labrador communal fixed gear groundfish licence also permits activity in Div. 2GHJ, north of the Study Area (D. Ball and D. Tobin, DFO, Resource Management and Aboriginal Fisheries, pers. comm. 3 December 2015). The Qalipu First Nation Band holds CCFLs for snow crab and groundfish in Div. 3K and for shrimp in SFA 6, both areas occurring north of the Study Area (D. Ball and D. Tobin, DFO, Resource Management and Aboriginal Fisheries, pers. comm. 3 December 2015).

According to the Southern and Eastern Newfoundland SEAs (C-NLOPB 2010, 2014), there are no other Aboriginal fisheries that occur in the Study Area.

4.2.3 Recreational Fisheries

Recreational fisheries in Newfoundland and Labrador are described in § 3.3.3 of the Southern Newfoundland SEA (C-NLOPB 2010), § 4.3.5 of the EA (LGL 2014a), and § 4.2.3 of the 2015 EA Update (LGL 2015b). In 2015, the recreational groundfish fishery occurred in all NAFO areas around Newfoundland and Labrador, including Div. 2GH, 2J3KL, 3Ps, 3Pn and 4R, with the exception of the Eastport (northeast Newfoundland) and Gilbert Bay (southeast Labrador) Marine Protected Areas (MPAs) (DFO 2015d). Portions of Div. 3L and 3Ps overlap the Study Area. This fishery, which was conducted primarily in coastal and inshore waters (C-NLOPB 2014), was open for three weeks in the summer (July–August) of 2015, and for nine days in September 2015 (DFO 2015d). Although information for the 2016 recreational fishery season is not yet available on the DFO website, the dates for the summer and fall recreational fisheries are quite consistent from year-to-year.

Species typically harvested during recreational fisheries include brown trout (*Salmo trutta*), Atlantic mackerel (*Scomber scombrus*), squid (*Illex* sp.), capelin (*Mallotus villosus*) and Atlantic cod (C. Boland, DFO, pers. comm. 2009 in C-NLOPB 2010). Current management measures indicate that there is no

requirement for licences or tags, and the retention of Atlantic halibut, spotted wolffish (*Anarhichas minor*), northern wolffish (*A. denticulatus*) and any species of shark is prohibited (DFO 2015d).

As per § 4.2.3 in LGL 2015b, given the Study Area's distance from shore it is highly unlikely that any recreational fisheries will be conducted in it.

4.2.4 Aquaculture

As indicated in the Southern Newfoundland SEA (see § 3.3.2 in C-NLOPB 2010) and Eastern Newfoundland SEA (see § 4.3.4.3 in C-NLOPB 2014), there are no approved aquaculture sites in the Study Area. Currently, all aquaculture sites in Newfoundland and Labrador are located on the coast, west of the Study Area (see Figure 4.150 in C-NLOPB 2014; DFA 2015).

4.2.5 DFO and Industry Science Surveys

DFO Research Vessel (RV) data collected during annual multi-species trawl surveys between 2007–2011 were presented in the EA (see § 4.3.7 in LGL 2014a). The 2012 RV data were analyzed in the 2015 EA Update (LGL 2015b). Results of analysis of the 2013 dataset for spring (April–June) and fall (September–October) RV surveys in the Study Area did not indicate any major differences in either the predominant species caught or the harvest locations compared to previous survey years (see Table 4.4 and Figure 4.34 in LGL 2014a). Contrary to previous years, there were no RV survey data collected in the Study Area during November in 2013. Similarly, no RV survey data were collected during either July or December in 2012 and 2013 (LGL 2015b). During 2013, many RV harvest locations were in the western portion of the easternmost 2016 AOI, and northern and northeastern portions of the westernmost 2016 AOI, in areas where water depths are <1,000 m (Figure 4.7).

Fisheries research surveys conducted by DFO and the fishing industry were described in § 4.3.8 of the EA (LGL 2014a). The tentative schedule of the 2016 DFO multispecies science surveys (RV surveys) is presented below (Table 4.3) (G. Sheppard, Technician, DFO, pers. comm. 27 January 2016). Spring RV surveys are currently set to begin at the end of March and continue into early-June, with surveys potentially occurring in the Study Area throughout this period. DFO fall RV surveys will begin in mid-September and end in early-December, and may occur in the Study Area throughout this time, with the least amount of survey activity potentially during late-October to early-November.

The Industry-DFO Collaborative Post-season Trap Survey for Snow Crab was described in § 4.3.8 of the EA (LGL 2014a). As indicated in the EA and in Figure 4.8, several DFO-Industry collaborative post-season snow crab trap survey stations are located in the northwest and north-central portions of the Study Area, in Div. 3L, 3N, 3O and 3Ps. Six stations occur in the north-central portion of the easternmost 2016 AOI, and 26 stations occur in the northern portion of the westernmost 2016 AOI. Sampling at these stations will occur annually during the September–November period.

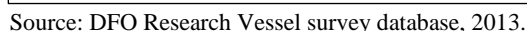
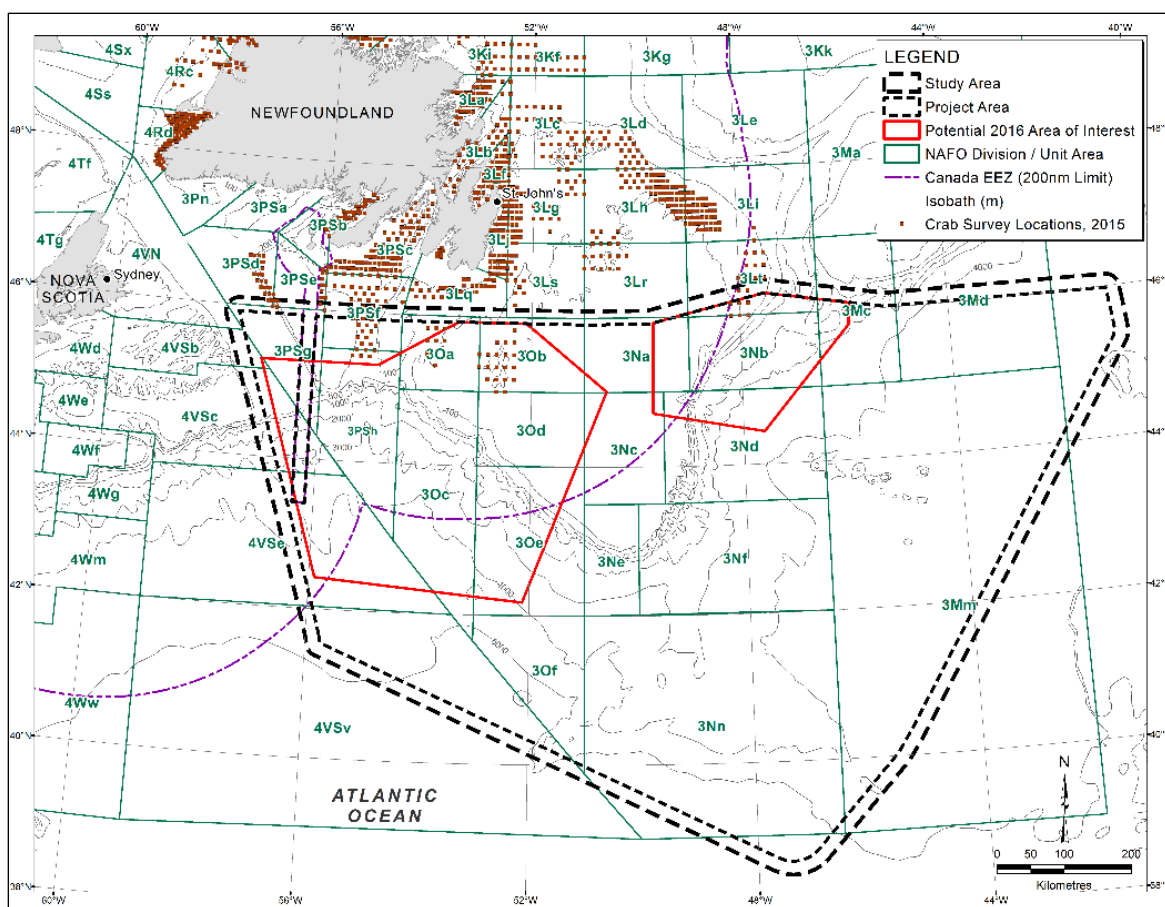


Table 4.3 Tentative Schedule of DFO RV Surveys in 2016.

Notes:

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Source: DFO 2015.

Figure 4.8 Locations of Sampling Stations Associated with the Industry-DFO Collaborative Post-season Trap Survey for Snow Crab.

4.3 Seabirds

The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and its associated Amendment (LGL 2015a).

4.3.1 Storm-Petrels

More than two million pairs of Leach's Storm-Petrel nest on the Avalon Peninsula. Scientific evidence suggests the population of Newfoundland Leach's Storm-Petrels is experiencing a significant decline. Preliminary results from a 2013 survey of nesting Leach's Storm-Petrel on Baccalieu Island, the largest breeding colony of this species in the world, provide an estimate of just over 2 million pairs (~40% decline compared to the previous survey in 1984) (EC-CWS unpublished). The results of surveys of nesting Leach's Storm-Petrels on Gull Island in the Witless Bay Ecological Reserve showed a ~51% decline from 352,000 breeding pairs in 2001 to 180,000 pairs in 2012 (EC-CWS unpublished).

There have been recent studies of the movements of Leach's Storm-Petrel using telemetry. A bird outfitted with a geolocator in the Gull Island, Newfoundland colony migrated to Cape Verde Islands off the west coast of Africa in early-December, averaging 420 km/day during the 12-day migration. The Leach's Storm-Petrel appears to have remained in this area for at least five weeks, at which time the transmitter stopped functioning. A Leach's Storm-Petrel tagged in Nova Scotia followed a similar southward track, departing Nova Scotia in mid-October. It staged for several weeks near the Cape Verde Islands before continuing on to the eastern tip of Brazil where it spent the rest of the winter. It migrated north again in early-April (Pollet et al. 2014a).

Leach's Storm-Petrels outfitted with geolocators travelled up to $1,015 \pm 238$ km during foraging trips from nesting colonies in Nova Scotia (Pollet et al. 2014b). Newfoundland breeders can be expected to travel a similar distance from their breeding colonies, if required, putting most of the Study Area off eastern and southern insular Newfoundland within reach.

4.3.2 Seabird Breeding

Table 4.4 provides updated numbers of pairs of breeding seabirds relevant to this project.

4.4 Marine Mammals and Sea Turtles

The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and its associated Amendment (LGL 2015a).

4.4.1 Updated COSEWIC Designations

The following are updated COSEWIC status designations (COSEWIC 2016) for marine mammals and sea turtles included in Table 4.10 of the MKI EA (LGL 2014a) and described in the 2015 EA Update (LGL 2015b). These changes in status do not affect the effects assessment or requirement for mitigation measures.

- Harp seal (*Pagophilus groenlandicus*) (Atlantic) – changed from *mid-priority candidate* species in the EA (LGL 2014a) to *high-priority candidate* species in the 2015 EA Update (LGL 2015b), and is currently considered *low-priority candidate* species.
- Hooded seal (*Cystophora cristata*) (Atlantic) – changed from *mid-priority candidate* species in the EA (LGL 2014a) to *high-priority candidate* species in the 2015 EA Update (LGL 2015b), and is currently considered *mid-priority candidate* species again.
- Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (Atlantic) – changed from *non-candidate* species to *low-priority candidate* species.

Table 4.4 Estimated Numbers of Pairs of Colonial Seabirds Nesting at Important Bird Areas (IBAs) and other Important Sites along Newfoundland's South Coast.

Species	Witless Bay Islands IBA ^m	Mistaken Point IBA ^m	Western Head	Cape St. Mary's IBA ^m	Corbin Island IBA	Middle Lawn Island IBA	Green Island IBA	Grand Colombier Island IBA	Miquelon Cape IBA	Penguin Islands	Ramea Colombier Island
Northern Fulmar	13 ^a			Present ^b	-	-	-				
Manx Shearwater	-			-	-	7 ^e	-				
Leach's Storm-Petrel	314,020 ^a			-	100,000 ^b	13,879 ^j	103,833 ^f	363,787 ^h		100 ^b	1000 ^b
Northern Gannet	-			14,789 ^a	-	-	-				
Herring Gull	2,045 ^a		100 ^b	Present ^b	5000 ^b	20 ^b	Present ^g	60-100 ⁱ	265 ^b		
Great Black-backed Gull	15 ^a		15 ^b	Present ^b	25 ^b	6 ^b	-	10-20 ⁱ			Present ^b
Black-legged Kittiwake	13,950 ^a	4750 ^d	1100 ^b	10,000 ^b	50 ^b	-	-	196 ⁱ	2415 ^b		Present ⁱ
Arctic and Common Terns	-			-	-	-	Breeding ^g			Present ^c	<100 ^b
Common Murre	268,660 ^a	~ 100 ^d	27 ^b	15,484 ^a	-	-	-	>3 ⁱ			
Thick-billed Murre	240 ^d			1000 ^b	-	-	-				
Razorbill	846 ^a	Present ^d	7 ^b	100 ^b	-	-	-	>50 ⁱ			
Black Guillemot	20+ ^b	Present ^d	20 ^b	Present ^b	-	-	-	>46 ⁱ	Present ^b		
Atlantic Puffin	324,650 ^a	50 ^d		-	-	-	-	9,543 ⁱ			75 ^b
TOTALS	924,453	>4,900	1,269	>41,373	105,075	13,912	>103,833	>373,695	>2,680	>100	~1,175

Sources: ^a EC-CWS, unpubl. data; ^b Cairns et al. (1989); ^c Lock et al. (1994); ^d Parks and Natural Areas (unpubl. data); ^e Fraser et al. (2013); ^f Russell (2008); ^g www.ibacanada.ca; ^h Lormée et al. (2012); ⁱ Lormée et al. (2008) as cited in Lormée et al. (2012); ^j Robertson et al. (2002).

4.4.2 Updated Population/Abundance Estimates

Updated marine mammal and sea turtle population/abundance estimates are as follow:

- Fin whale (*Balaenoptera physalus*) – the current estimate for the western North Atlantic stock is 1,618 individuals (CV = 0.33; Waring et al. 2015).
- Harbour seal (*Phoca vitulina*) – the updated 2012 abundance estimate for the western North Atlantic stock of harbour seals is 75,834 (Waring et al. 2015).

4.4.3 Additional References

A blue whale (*Balaenoptera musculus*) tagged in the St. Lawrence Estuary on November 4, 2014 travelled to the southwest coast of Newfoundland (west of the Project Area) in the same month, and then continued southward through offshore Nova Scotia and the eastern U.S. coast. The whale returned to the southwest coast of Newfoundland in March 2015 (in the northwestern portion of the Project Area) (V. Lesage, DFO Research Scientist, pers. comm., 15 December 2015).

Recent acoustic evidence indicates that the northern bottlenose whale (*Hyperoodon ampullatus*) population remains in the Gully and adjacent submarine canyons year-round (H. Moors-Murphy, DFO Biologist, pers. comm., 18 December 2015).

4.5 Species at Risk

The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and its associated Amendment (LGL 2015a).

Table 4.5 includes the species/populations at risk that could potentially occur in the Study Area, based on available information at the websites for SARA and COSEWIC as of May 2016. Changes in species status since preparation of the 2015 EA Update are described below and noted in red font and light grey shading in Table 4.5.

- Winter skate (*Leucoraja ocellata*) (Eastern Scotian Shelf – Newfoundland population) added; given *endangered* status under COSEWIC in May 2015;
- Leatherback sea turtle (*Dermochelys coriacea*) has been given two separate statuses under SARA: (1) the leatherback sea turtle, in general, has an *endangered* status under Schedule 1 of SARA but no status under COSEWIC; and (2) the Atlantic population of this sea turtle has an *endangered* status under COSEWIC but no status under SARA;
- Hooded seal (*Cystophora cristata*) – COSEWIC status changed from a high priority to a mid-priority candidate species;
- Harp seal (*Phoca groenlandica*) – COSEWIC status changed from a high priority to a low priority candidate species; and
- Cuvier's beaked whale (*Ziphius cavirostris*) – COSEWIC status changed from a mid-priority to a high priority candidate species.

Table 4.5 SARA-Listed and COSEWIC-Assessed Marine Species that Potentially Occur in the Study Area.

SPECIES		SARA ^a			COSEWIC ^b			
Common Name	Scientific Name	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate Species
Marine Mammals								
Blue Whale (Atlantic population)	<i>Balaenoptera musculus</i>	Schedule 1			X			
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	Schedule 1			X			
Northern Bottlenose Whale (Scotian Shelf population)	<i>Hyperoodon ampullatus</i>	Schedule 1			X			
Beluga Whale (St. Lawrence Estuary population)	<i>Delphinapterus leucas</i>		Schedule 1		X			
Fin Whale (Atlantic population)	<i>Balaenoptera physalus</i>			Schedule 1			X	
Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>			Schedule 1			X	
Harbour Porpoise (Northwest Atlantic population)	<i>Phocoena phocoena</i>		Schedule 2				X	
Humpback Whale (Western North Atlantic population)	<i>Megaptera novaeangliae</i>			Schedule 3				
Killer Whale (Northwest Atlantic/ Eastern Arctic population)	<i>Orcinus orca</i>						X	
Sei Whale (Atlantic population)	<i>Balaenoptera borealis</i>							High priority
Ringed Seal	<i>Phoca hispida</i>							High priority
Hooded Seal	<i>Cystophora cristata</i>							Mid priority
Harp Seal	<i>Phoca groenlandica</i>							Low priority
Bearded Seal	<i>Erignathus barbatus</i>							Mid priority
Sperm Whale	<i>Physeter microcephalus</i>							Mid priority
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>							High priority
Sea Turtles								
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Schedule 1						
Leatherback Sea Turtle (Atlantic population)	<i>Dermochelys coriacea</i>				X			
Loggerhead Sea Turtle	<i>Caretta caretta</i>				X			
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>							Low priority
Fishes								
White Shark (Atlantic population)	<i>Carcharodon carcharias</i>	Schedule 1			X			
Northern Wolffish	<i>Anarhichas denticulatus</i>		Schedule 1			X		
Spotted Wolffish	<i>Anarhichas minor</i>		Schedule 1			X		
Atlantic Wolffish	<i>Anarhichas lupus</i>			Schedule 1			X	
Atlantic Cod	<i>Gadus morhua</i>			Schedule 3				
Atlantic Cod (Newfoundland and	<i>Gadus morhua</i>				X			

SPECIES		SARA ^a			COSEWIC ^b			
Common Name	Scientific Name	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate Species
Labrador population)								
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			
Winter Skate (Eastern Scotian Shelf – Newfoundland population)	<i>Leucoraja ocellata</i>				X			
Atlantic Salmon (various populations)	<i>Salmo salar</i>				X	X	X	
American Eel	<i>Anguilla rostrata</i>					X		
Shortfin Mako Shark (Atlantic population)	<i>Isurus oxyrinchus</i>					X		
American Plaice (Newfoundland and 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		
White Hake (Atlantic and Northern Gulf of St. Lawrence population)	<i>Urophycis tenuis</i>					X		
Smooth Skate (Laurentian-Scotian population)	<i>Malacoraja senta</i>						X	
Blue Shark (Atlantic population)	<i>Prionace glauca</i>						X	
Basking Shark (Atlantic population)	<i>Cetorhinus maximus</i>						X	
Spiny Dogfish (Atlantic population)	<i>Squalus acanthias</i>						X	
Roughhead Grenadier	<i>Macrourus berglax</i>						X	
Thorny Skate	<i>Amblyraja radiata</i>						X	
Northwest Atlantic Lumpfish	<i>Cyclopterus lumpus</i>							High priority
Spinytail Skate	<i>Bathyraja spinicauda</i>							Mid priority
Pollock	<i>Pollachius virens</i>							Mid priority
Greenland Shark	<i>Somniosus microcephalus</i>							Mid priority
Atlantic Mackerel	<i>Scomber scombrus</i>							Mid priority
Alewife	<i>Alosa pseudoharengus</i>							Mid priority
Birds								
King Eider	<i>Somateria spectabilis</i>							Low priority

Sources: ^a SARA website (http://www.sararegistry.gc.ca/species/default_e.cfm), accessed May 2016; ^b COSEWIC website (<http://www.cosewic.gc.ca/index.htm>); accessed May 2016.

As of May 2016, no other species/populations that could potentially occur in the Study Area have been added to Schedule 1 of *SARA*.

MKI will monitor *SARA* issues through the law gazettes, the Internet, and communication with DFO and Environment Canada, and will adaptively manage any issues that may arise in the future. MKI will comply with relevant regulations pertaining to *SARA* Recovery Strategies and Action Plans, and continue to exercise due caution to minimize impacts on species at risk during all of its operations. MKI also understands that other species/populations may be given either *endangered* or *threatened* status under Schedule 1 of *SARA* during the course of the Project, and will continue to monitor for any status changes.

4.6 Sensitive Areas

The new information presented in this subsection does not change the effects predictions made in the EA (LGL 2014a) and its associated Amendment (LGL 2015a).

No additional Ecologically and Biologically Significant Areas (EBSAs) have been designated in either the Placentia Bay-Grand Banks Large Ocean Management Area (PG-GB LOMA) or the Scotian Shelf Bioregion since the 2015 EA Update was prepared (see § 4.6 of LGL 2015a). The six PB-GB LOMA EBSAs (Virgin Rocks, Southeast Shoal and Tail of the Banks, Southwest Shelf Edge and Slope, St. Pierre Bank, Laurentian Channel and Slope, and Lilly Canyon-Carson Canyon) and five Scotian Shelf Bioregion EBSAs (Eastern Shoal, Stone Fence and Laurentian Environs, Laurentian Channel Slope, Laurentian Channel Cold Seep, and Scotian Slope) that overlap the Study Area are shown in Figure 4.9. Also shown in Figure 4.9 is the Laurentian Channel Area of Interest (AOI) for potential designation as a Marine Protected Area (MPA). It was announced as an AOI in 2010. A Terms of Reference related to Canada's agreement to the Convention on Biological Diversity Aichi Target 11 was recently released by DFO. It includes the goal of conserving 10% of coastal and marine areas by 2020 (DFO 2016a). Oceans has requested that DFO Science provide detailed descriptions of sub-areas as well as geospatially-referenced data layers for sub-areas of the EBSAs in the PB-GB LOMA (DFO 2016a).

No NAFO Conservation and Enforcement Areas, including Seamount Closure Areas, have been designated or modified since the 2015 EA Update (NAFO 2015c). Three NAFO seamount closure areas occur in the Study Area: (1) Fogo Seamount 1; (2) Fogo Seamount 2; and (3) Newfoundland Seamounts (Figure 4.9). They are briefly described in § 4.6 of LGL (2015a). These areas are closed to all bottom fishing activities until at least 31 December 2020 (NAFO 2015c).

There have not been any new designations or modifications of Coral/Sponge Closure Areas by the Northwest Atlantic Fisheries Organization (NAFO) Scientific Council since the 2015 EA Update. Four of the 13 Coral/Sponge Closure Areas overlap with the Study Area. These Coral/Sponge Closure Areas are closed to all bottom fishing activities until at least 31 December 2020 (NAFO 2015c).

The NAFO 3O UA Coral Closure area described in § 4.6.3 of LGL (2015a) has mandatory closure to all bottom fishing activities on the slope of the Grand Bank in NAFO Div. 3O at depths ranging from 800–2,000 m (Figure 4.9). The protection zone, which encompasses an area of 14,040 km², was initiated by the Canadian-NAFO Working Group and implemented by NAFO (NAFO 2015c). The purpose of the closure is to protect corals found in the area and ‘freeze the footprint’ of fishing activities in deeper waters. This area is closed to all bottom fishing activities until at least 31 December 2020 (NAFO 2015c).

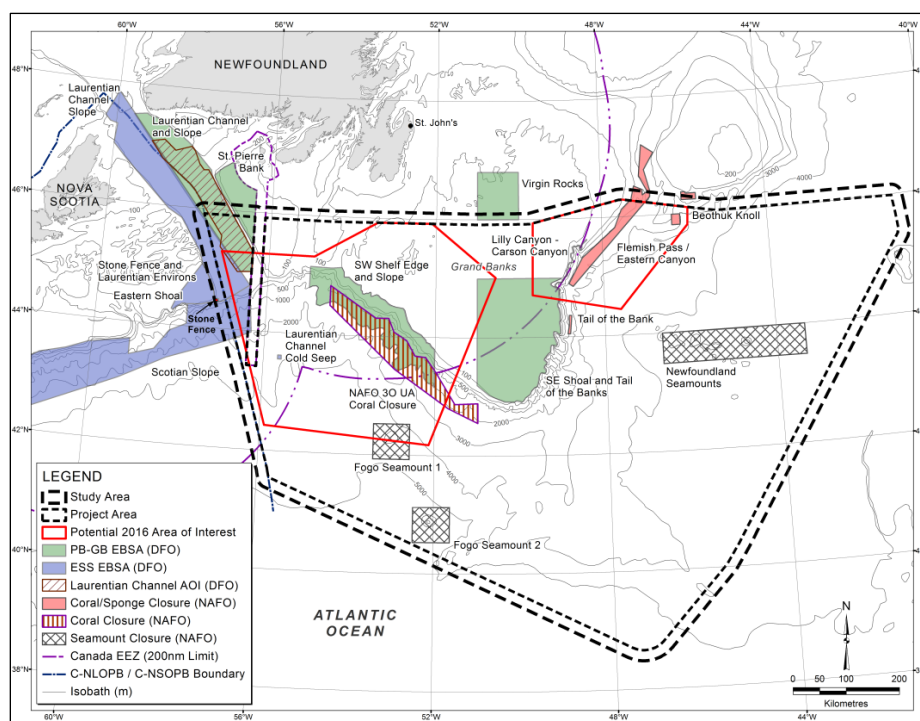


Figure 4.9 Sensitive Areas that Overlap the Study Area.

5.0 Consultations

The document One Ocean Protocol for Consultation Meetings: Recommendations for the Fishing and Petroleum Industries in Newfoundland and Labrador (One Ocean 2013a) outlines recommendations for preparing, convening and following up on consultation meetings.

Newsletters describing the seismic activities proposed for 2016 were distributed during the week of March 14, 2016 to the same stakeholders/groups consulted in previous years. The newsletter and details of those consulted by MKI are presented in Appendices 1 and 2, respectively.

Face-to-face meetings (see Appendix 2) were held with DFO, the Fish, Food and Allied Workers Union/Unifor (FFAW/Unifor), and Ocean Choice International (OCI) on January 27, 2016.

The discussion with DFO focused on MKI’s acquisition plans with respect to the Industry-DFO Collaborative Post-season Trap Survey for Snow Crab.

During MKI's meeting with the FFAW/Unifor, the focus of conversation was related to routine communication and coordination between MKI and the fishing industry. The FFAW/Unifor representatives suggested that MKI present its 2016 plans to a fishers group in Marystown, NL. A meeting in Marystown was scheduled for February 25, 2016; however, poor weather forced its cancellation. It was then agreed that the FFAW/Unifor would contact MKI and propose another date for the meeting to ensure that the appropriate fishers could attend. MKI has not heard from the FFAW/Unifor since then regarding a rescheduled meeting. As a result of discussions with FFAW/Unifor, MKI has voluntarily removed a number of seismic lines originally planned in the northern part of NAFO Division 3Ps from its 2016 program.

The meeting with OCI involved discussion of scheduling of MKI's activities around OCI's anticipated activities during the early part of the 2016 season.

6.0 Environmental Assessment

6.1 Mitigation Measures

The mitigation measures described in the EA (LGL 2014a) and associated documents (LGL 2014b, 2015a,b; PGS 2016) remain applicable to MKI's seismic survey activities planned for 2016.

In 2011, One Ocean reviewed fishing and petroleum industry processes and practices for offshore seismic survey operations in Newfoundland and Labrador with the intention of identifying opportunities to better understand and improve operational processes that would mutually benefit both industries. Results of the review are outlined in the document One Ocean Protocol for Seismic Survey Programs in Newfoundland and Labrador (One Ocean 2013b).

6.2 Validity of Significance Determinations

Based on careful consideration of newly available biological environment information presented in § 4.0 and results of consultations with stakeholders, the determinations of significance of the residual effects of seismic survey activities on VECs presented in the EA (LGL 2014a) and its Amendments (LGL 2015a; PGS 2016) remain valid for the seismic survey activities planned by MKI in 2016.

7.0 Concluding Statement

The seismic survey activities that MKI plans to conduct in 2016 have been reviewed and determined to be within the scope of the EA (LGL 2014a), its Addendum (LGL 2014b), and its Amendment (LGL 2015a). A second Amendment (PGS 2016) of the EA has been submitted to the C-NLOPB and is currently undergoing review (see Table 1.1). The environmental effects predicted in the EA and its associated Addendum and Amendment remain valid. MKI reaffirms its commitment to implement the mitigation measures proposed in these assessment documents and in the Screening Decisions made by the C-NLOPB.

8.0 References

- Cairns, D.K., W.A. Montevecchi, and W. Threlfall. 1989. Researcher's guide to Newfoundland seabird colonies. Second edition, Memorial Univ. Newfoundland Occ. Pap. Biol. No. 14. 43 p.
- Casas, J.M., E. Román, and J. Teruel. 2015. Northern shrimp (*Pandalus borealis*, Krøyer) from EU-Spain bottom trawl survey 2015 in NAFO Div. 3LNO. NAFO SCR Doc. 15/048.
- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2010. Southern Newfoundland strategic environmental assessment. LGL Rep. SA1037. Rep. by LGL Limited, St. John's, NL, Oceans Limited, St. John's, NL, Canning & Pitt Associates, Inc., St. John's, NL, and PAL Environmental Services, St. John's, NL, for Canada-Newfoundland and Labrador Offshore Petroleum Board, St. John's, NL. 333 p. + appendices.
- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2012. Canada-Newfoundland and Labrador Offshore Petroleum Board: Geophysical, Geological, Environmental and Geotechnical Program Guidelines, January 2012.
- C-NLOPB. 2014. Eastern Newfoundland strategic environmental assessment. Rep. by AMEC Environment & Infrastructure, St. John's, NL, for the C-NLOPB, St. John's, NL. 527 p. + appendices.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada) website. 2016. Available at http://www.cosewic.gc.ca/eng/sct5/index_e.cfm
- DFA (Department of Fisheries and Aquaculture). 2015. Seafood industry year in review 2014. Fisheries and Aquaculture, Government of Newfoundland and Labrador. 38 p. Available at <http://www.fishaq.gov.nl.ca/>.
- DFO (Fisheries and Oceans Canada). 2010. Snow crab (*Chionoecetes opilio*) – Newfoundland and Labrador – 2009-2011. Government of Canada. Available at <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/snow-crab-neige/snow-crab-neiges2009-eng.htm>.
- DFO (Fisheries and Oceans Canada). 2013. 2012 Canadian Atlantic quota report – Cod – Catch to date (M.T.). Commercial Fisheries: Quota Reports. Available at <http://www.dfo-mpo.gc.ca/stats/commercial/qc-rc/2012/cod-eng.htm>.
- DFO (Fisheries and Oceans Canada). 2015a. Oceanographic conditions in the Atlantic zone in 2014. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2015/030.
- DFO. 2015b. Assessment of Newfoundland and Labrador snow crab. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2015/029.
- DFO. 2015c. Stock Assessment of NAFO subdivision 3Ps cod. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2015/001.

- DFO. 2015d. Decisions for Atlantic Canada, Quebec and the Arctic – 2015. Government of Canada. Available at <http://www.dfo-mpo.gc.ca/decisions/fm-2015-gp/index-atl-eng.htm>.
- DFO. 2016a. Terms of Reference. Refinement of information relating to Ecologically and Biologically Significant Areas (EBSAs) identified in the Newfoundland and Labrador (NL) Bioregion. Regional Science Response Process – Newfoundland and Labrador Region. January 29, 2016, St. John's, NL. Available at http://www.dfo-mpo.gc.ca/csas-sccs/Schedule-Horraire/2016/01_29b-eng.html.
- EC-CWS (Environment Canada-Canadian Wildlife Service). Unpublished data.
- Fraser, G.S., J. Russell, G.J. Robertson, R. Bryant, and D.A. Fifield. 2013. Prospects for the Manx Shearwater colony on Middle Island, Newfoundland, Canada. *Marine Ornithology* 41: 137-140.
- LGL (LGL Limited). 2014a. 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. + appendices.
- LGL. 2014b. Environmental Assessment MKI Southern Grand Banks Seismic Program, 2014–2018 Addendum. 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. 36 p.
- LGL. 2015a. Amendment to the Environmental Assessment MKI Southern Grand Banks Seismic Program, 2014-2018. LGL Rep. FA0038. Rep. by LGL Limited, St. John's, NL for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 9 p.
- LGL. 2015b. Environmental Assessment Update of the MKI Southern Grand Banks Seismic Program, 2014-2018. LGL Rep. FA0038. Rep. by LGL Limited, St. John's, NL for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 28 p. + appendices.
- Lock, A.R., R.G.B. Brown, and S.H. Gerriets. 1994. Gazetteer of marine birds in Atlantic Canada. An atlas of seabird vulnerability to oil pollution. Canadian Wildlife Service, Environmental Conservation Branch, Environment Canada, Atlantic Region. 137 p.
- Lormée, H., K. Delord, B. Letournel, and C. Barbraud. 2012. Population survey of Leach's Storm-Petrels breeding at Grand Colombier Island, Saint-Pierre and Miquelon archipelago. *Wilson J. of Ornithology* 124(2): 245-252.
- NAFO (Northwest Atlantic Fisheries Organization). 2014. Report of Scientific Council Meeting, 31 May - 12 June 2014.

- NAFO. 2015a. NAFO making waves: Bans on bottom fishing. Press Release. Available at <http://www.nafo.int/fisheries/frames/fishery.html>.
- NAFO. 2015b. NAFO regulated stocks. Available at <http://www.nafo.int/science/nafo-stocks.html>.
- NAFO. 2015c. Northwest Atlantic Fisheries Organization conservation and enforcement measures. NAFO/FC Doc. 15/01. Serial No. N6409.
- NAFO. 2016. NAFO quota tables. Available at <http://www.nafo.int/fisheries/frames/fishery.html>.
- Oceans (Oceans Limited). 2014. Physical environmental study for the southern Grand Banks seismic program 2014-2018. Rep. by Oceans Limited, St. John's, NL, for LGL Limited, St. John's, NL. 135 p. + appendices.
- One Ocean. 2013a. One Ocean Protocol for Consultation Meetings: Recommendations for the Fishing and Petroleum Industries in Newfoundland and Labrador. 7 p + app.
- One Ocean. 2013b. One Ocean Protocol for Seismic Survey Programs in Newfoundland and Labrador. 17 p + appemdx.
- Parks and Natural Areas. Department of Environment and Conservation, Government of Newfoundland and Labrador. Unpublished data.
- PGS. 2016. Amendment to EA of MKI Southern Grand Bank Seismic Program, 2014-2018. Letter by PGS for the Canada-Newfoundland and Labrador Offshore Petroleum Board, St. John's, NL. 2 p.
- Pollet, I.L., A. Hedd, P.D. Taylor, W.A. Montevecchi, and D. Shutler. 2014a. Migratory movements and wintering areas of Leach's Storm-Petrels tracked using geolocators. *Journal of Field Ornithology*. 85:321-328, 2014.
- Pollet, I. L., R. A. Ronconi, I. D. Jonsen, M. L. Leonard, P. D. Taylor, and D. Shutler. 2014b. Foraging movements of Leach's storm-petrels *Oceanodroma leucorhoa* during incubation. *Journal of Avian Biology* 45:001-010, 2014.
- Robertson, G.J., J. Russell, and D. Fifield. 2002. Breeding population estimates for three Leach's Storm-Petrel colonies in southeastern Newfoundland, 2001. *Can. Wildl. Serv., Atl. Reg., Tech. Rep. Ser. No. 380*.
- Román, E., Á. Armesto and D. González-Troncoso. 2015. Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish survey in the NAFO Div. 3L for the period 2003-2014. NAFO SCR Doc. 15/020.
- Russell, J. 2008. Population estimate for the colony of leach's Storm-Petrels (*Oceanodroma leucorhoa*) breeding on Green Island, Fortune Bay, southern Newfoundland in 2008. DFO internal report.

- SARA (*Species at Risk Act*) website. 2016. Available at <http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>
- Simpson, M.R., C.M. Miri, and R.K. Collins. 2015. An Assessment of White Hake (*Urophycis tenuis*, Mitchill 1815) in NAFO Divisions 3N, 3O, and Subdivision 3Ps. NAFO SCR Doc. 15/023.
- Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2015. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2014. NOAA Tech Memo NMFS NE 231: 361 p. doi: 10.7289/V5TQ5ZH0.

Personal Communication

- Ball, D. Resource Management and Aboriginal Fisheries, DFO. 3 December 2015.
- Lesage, V. Pelagic and Ecosystem Science Branch, DFO. 15 December 2015.
- Moors-Murphy, H. Oceanography and Climate Section, DFO. 18 December 2015.
- Sheppard, G. Program Services and Planning, DFO. 27 January 2016.
- Tobin, D. Resource Management and Aboriginal Fisheries, DFO. 3 December 2015.

List of Appendices

Appendix 1 – MKI Newsletter Distributed to Consultees

Appendix 2 – List of Consultees Contacted by MKI

Appendix 1

MKI Newsletter Distributed to Consultees

Resumption of the Program in 2016

This news update is to inform stakeholders and other interested parties of the continuation of MKI's 2D seismic program, started in 2014 and continued in 2015, in the offshore waters of the Southern Grand Banks. The Project Area is within the regulatory jurisdiction of the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) and it is expected that the Atlantic Explorer will again be acquiring the survey data between June and October 2016.



Figure 1: Atlantic Explorer

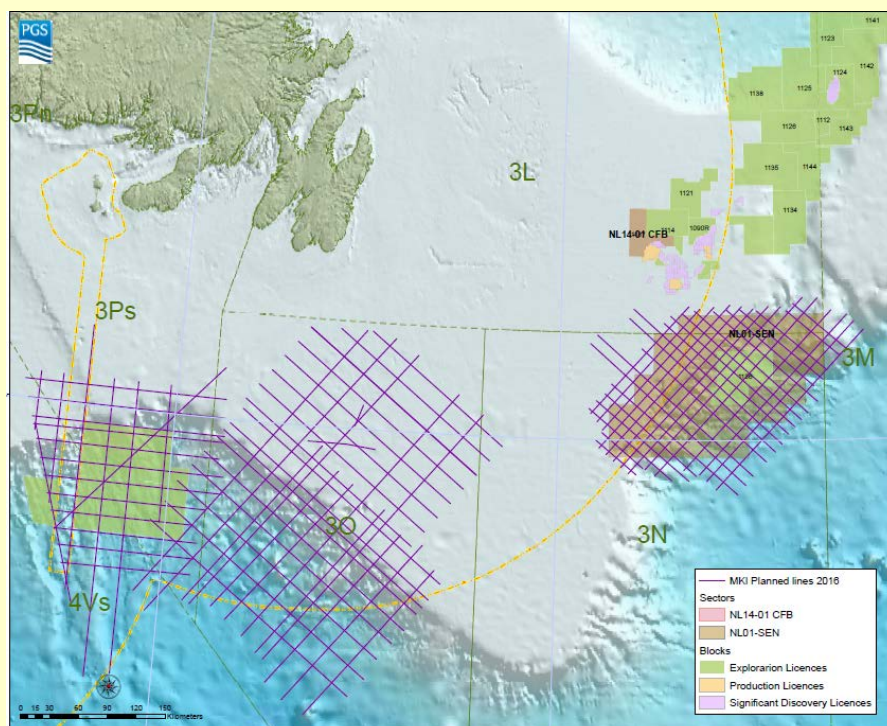


Figure 2: Provisionally planned 2016 survey lines

Ongoing Communication

As a component of the ongoing communications between MKI and local fisheries organizations, MKI will be providing weekly briefing materials including information such as updated schedules, maps, and/or revised timelines.

Employment Opportunities

Employment opportunities associated with this year's operating season have been considered and it has been determined that there will be possible hiring opportunities as part of the maritime crew. The recruitment process through a local agency will commence in the coming weeks and interested parties should look out for notices posted in community employment offices and other advertisements.

How to Access Environmental Information about the Project

The Environmental Assessment (EA) for the Southern Grand Banks Seismic Program 2014-2018 along with additional documentation including the Annual EA Update can be accessed on the C-NLOPB website (www.cnlopb.ca).

From the C-NLOPB homepage, click on the "Environment" link near the bottom of the page. Then click on the "Project-Based Environmental Assessment" link. Click on the "Completed" link. Once this page has opened, scroll down to the project titled "MKI Southern Grand Banks Seismic 2014-2018" and click on the link. Here you can find all environmental documents related to this project.

The EA provides a comprehensive and detailed overview of the project. The overview includes: information on the Physical and Biological Environment, including Fisheries, Fish and Fish Habitat, Marine Mammals and Species at Risk, and a Cumulative Effects Assessment.

Upon the completion of every acquisition season an Environmental Report is supplied to the C-NLOPB and other government agencies. This report summarizes the marine mammal observations, bird observations and interactions.

Contact Information

If you have any inquiries regarding the Southern Grand Banks Seismic Program (2014-2018) please feel free to contact:

Petroleum Geo-Services
15375 Memorial Drive, Suite 100
Houston, Texas, 77079
(P) 1-281-509-8000
(F) 1-281-509-8500
canada@pgs.com



Appendix 2

List of Consultees Contacted by MKI

Organization or Group Name	Email Address	Contact Name	Engagement Type
Aquaforte			
Aquaforte Town Council	rhondaokeefe@aim.com	Rhonda O'Keefe	Table Meeting
Argentia			
Argentia Management Authority Inc.	w.brenton@argentina.ca	Harvey Brenton	Table Meeting
Arnold's Cove			
Town of Arnold's Cove	acadmin@bellaliant.com	Angie Gale	PPT, Handouts
Avalon Ocean Products Inc.	Avalon.ocean@nf.aibn.com	Aloysius Wadman	Information Pack
Hopkins & Quinton Fisheries Ltd.			Information Pack
Icewater Seafoods Inc.	awareham@icewaterseafoods.com	Alberto Wareham	Information Pack
Bay Bulls			
Town of Bay Bulls	townofbaybulls@nf.aibn.com	Sandra	Table Meeting
Burin			
Town of Burin	lhartson@townofburin.com	Leo Hartson, Town Manager	PPT, Handouts
Department of Fisheries and Oceans-Coast Guard			
Burin Harbour Authority	morrisfudge@yahoo.ca	Morris Fudge	Table Meeting
Burin Peninsula Environmental Reform Committee	info@greenburin.ca		Information Pack
Goff Fisheries Limited			Information Pack
College of North Atlantic			
Wave Energy Research Centre	mike.graham@cna.nl.ca	Michael Graham, Administrator	Information Pack
Come by Chance			
Town of Come by Chance	townofcbc@eastlink.ca	Stephanie Eddy, Clerk	Information Pack
Conne River			
Miaqpukek First Nation	thowse@mfn.gov.ca	Tracey Howse,	Information Pack

Organization or Group Name	Email Address	Contact Name	Engagement Type
		Director, Training and Economic Development	
Corner Brook			
Qalipu Mi'kmaq First Nation Band	reldridge@qalipu.ca	Ralph Eldridge, Manager of Community Economic Development	Information Pack
Ferryland			
Town of Ferryland	Town.ferryland@nf.aibn.com		Table Meeting
M. & A. Fisheries Limited	Ma.fisheries@nf.aibn.com	Angus O'Connell	Information Pack
Ferryland Fisheries Limited			Information Pack
Ferryland Fisheries Committee Limited->Now Ferryland Harbour Authority			Table Meeting
Fortune			
Town of Fortune	norma@townoffortune.ca	Norma Stacey, Clerk	Table Meeting
Fortune Harbour Authority	fortuneharbour@hotmail.com		Table Meeting
Ocean Choice International (fish plant)			
Atlantic Ocean Farms Limited	walsheslogybay@nl.rogers.com	David Walsh, President	Information Pack
Grand Bank			
Town of Grand Bank	Sdurnford@townofgrandbank.net	Sheila Durnford Office Administrator	Table Meeting
Clearwater Fisheries Limited			
Grand Bank Harbour Authority	hagb@bellaliant.com	Arch Evans	Table Meeting
Newfoundland and Labrador Department of Fisheries and Aquaculture			

Organization or Group Name	Email Address	Contact Name	Engagement Type
Marystown			
Town of Marystown	info@townofmarystown.ca	Dennis Kelly, Clerk	Table Meeting
Burin Peninsula Community Business Development Corporation	Audrey.hennebury@cbdc.ca	Audrey Hennebury, Admin Assistant	Information Pack
Burin Peninsula Chamber of Commerce	administration@bpchamber.ca		Information Pack
Burin Peninsula Environmental Reform Committee			Information Pack
Marystown Shipyard and Offshore Facilities	butlerwa@hotmail.com	Wayne Butler, President	Table Meeting
Department of Fisheries and Oceans			
Placentia			
Town of Placentia	dgear@placentia.ca	Debbie Gear, Executive Assistant	Table Meeting
Department of Fisheries and Oceans			
Newfoundland and Labrador Department of Industry, Trade and Rural Development			
Placentia Area Chamber of Commerce	Eugene.collins@placentiachamber.ca	Eugene Collins, Executive Director	Information Pack
Harbour Authority of Placentia Area	cnpomeroy@bellaliant.com	Carter Pomeroy	Table Meeting
Avalon Gateway Regional Economic Development Inc.	contact@avalongateway.ca	Michael Mooney, Executive Director	Information Pack
Avalon West Community Business Development Corporation	Tanya.white@cbdc.ca	Tanya White, Administrative Assistant	Information Pack
Placentia Area Development Association	Pada44@hotmail.com	Tiffany Seay-Hepditch, Executive Director	Information Pack

Organization or Group Name	Email Address	Contact Name	Engagement Type
Southern Harbour			
Town of Southern Harbour	twnsouthernhr@nf.aibn.com	Renee Hickey	Information Pack
St. Brides			
Town of St. Brides	Joanmorrisey01@yahoo.ca	Joan Morrissey, Clerk	Table Meeting
Ocean Choice International- Fish Plant			
St. Bride's Harbour Authoirty	Lorettaconway59@gmail.com	Loretta Conway	
St. Johns			
Fisheries and Oceans Canada- Coast Guard	Jason.kelly@dfo-mpo.gc.ca	Jason Kelly, Senior Fisheries Protection Biologist	Table Meeting
Environment Canada	Glenn.troke@ec.gc.ca	Glenn Troke. EA Coordinator	Table Meeting
Transport Canada	Clement.murphy@tc.gc.ca	Clement Murphy, Manager, Examinations, and Enforcement	Table Meeting
Parks Canada	Randy.thompson@pc.gc.ca	Randy Thompson, Resource Management Officer	Information Pack
National Defence	information@forces.gc.ca		Table Meeting
St. Johns Port Authority	jmcgrath@sjpa.com	Jeff McGrath, Director of Marine Safety and Security	Table Meeting
Newfoundland and Labrador Environment and Conservation			Table Meeting
Newfoundland and Labrador Fisheries and Aquaculture	Davidlewis@gov.nl.ca	David Lewis, Deputy Minister	Table Meeting
City of St. Johns	rellsworth@stjohns.ca	Ron	Table Meeting

Organization or Group Name	Email Address	Contact Name	Engagement Type
		Ellsworth, Deputy Mayor	
Food, Fish, and Allied Workers	jjoensen@ffaw.net	Johan Joensen, Petroleum Industry Liaison	Table Meeting
One Ocean	Maureen.murphy@mi.mun.ca	Director	Table Meeting
Groundfish Enterprise Allocation Council	bchapman@sympatico.ca	Bruce Chapman, Executive Director	Table Meeting
Association of Seafood Producers	dbutler@seafoodproducers.org	Derek Butler, Executive Director	Table Meeting
Seafood Processors of Newfoundland and Labrador	gjoyce@nf.sympatico.ca	George Joyce, Executive Director	Table Meeting
Beothic Fish Processors Ltd.	pgrant@beothic.com	Paul Grant, Executive Vice President	Information Pack
Breakwater Fisheries Limited	rrbarnes@nf.sympatico.ca	Randy Barnes	Information Pack
Canada Bay Seafoods Limited – Quinlin Brothers Subsidiary			Information Pack
Conche Seafoods Inc.- Quinlin Brothers Subsidiary	dphilpott@quinsea.com	Derrick Philpott, Director	Information Pack
Deep Atlantic International Inc.	Martha@deepatlanticsea.com	Martha Mullowney, Director	Information Pack
Dorset Fisheries Limited– Quinlin Brothers Subsidiary			Information Pack
GC Rieber Carino Ltd.	John.c.kearley@carino.ca	John Kearley, CEO	Table Meeting
Gulf Shrimp Limited – Quinlin Brothers Subsidiary			Table Meeting
HSF Ocean Products Limited	todd@hsfgroup.ca	Todd Hickey, Director	Information Pack

Organization or Group Name	Email Address	Contact Name	Engagement Type
Nataaqaq Fisheries	keith@natfish.ca	Keith Coady, Fleet Manager	Table Meeting
Newfound Resources Limited	jeff@nrl.nf.net	Jeff Simms, Operations Manager	Information Pack
Notre Dame Seafoods Inc.	jeveleigh@notredameseafoods.com	Jason Eveleigh, President	Information Pack
San-Can Fisheries Limited	sgoff@san-can.com	Sandra Goff, Director	Information Pack
Ocean Choice International	rellis@oceanchoice.com	Rick Ellis, Director of Fleet Operations	Table Meeting
Quinlan Brothers Ltd.	dearle@quinlanbros.ca	David Earle, Chief Financial Officer	Table Meeting
Nature Newfoundland and Labrador	zedel@mun.ca	Len Zedel	Table Meeting
St. Lawrence			
Town of St. Lawrence	townofstlawrence@nf.aibn.com	Ilyne	Table Meeting
Ocean Choice International-Fish Plant			
St. Mary's			
Town of St. Mary's	townofstmarys@nf.aibn.com	Patricia	Table Meeting
Csi Sea Products			Information Pack
Deep Atlantic Sea Products (plant manager in St. Johns)	Martha@deepatlanticsea.com	Martha Mullowney, Plan Manager	Information Pack
Sunnyside			
Town of Sunnyside	townofsunnyside@eastlink.ca	Philip Smith, Town Manager	Information Pack
Trepassey			
Town of Trepassey	jill@townoftrepassey.com	Jill MacNeil, Clerk	Information Pack
Trepassey Management Corporation	chairperson@nf.aibn.com	Rita Pennell, Chairperson	Information Pack
Southern Avalon Development	southernavalondevel@nf.aibn.com	Anita Molloy, VP and Board	Information Pack

Organization or Group Name	Email Address	Contact Name	Engagement Type
Association		Member	
Department of Fisheries and Oceans			
Witless Bay			
Town of Witless Bay	townofwitlessbay@nl.rogers.com	Geraldine Caul, Clerk	Information Pack
Shawmut Fisheries Ltd.			Information Pack

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Avalon.ocean@nf.aibn.com; awareham@icewaterseafoods.com; townofbaybulls@nf.aibn.com;
lhartson@townofburin.com; morrisfudge@yahoo.ca; info@greenburin.ca;
mike.graham@cna.nl.ca; townofcbc@eastlink.ca; thowse@mfgov.ca; reldridge@qalipu.ca;
Town.ferryland@nf.aibn.com; Ma.fisheries@nf.aibn.com; norma@townoffortune.ca;
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