

**Environmental Assessment  
MKI Labrador Sea Seismic Program, 2014–2018  
Addendum**

**Prepared by**



**for**

**Multi Klient Invest AS**  
Lilleakerveien 4C, P.O. Box 251  
Lilleaker, 0216, Oslo, Norway

and

**TGS-NOPEC Geophysical Company ASA**  
1051 Clay Road  
Houston, Texas, 77043, USA

**14 July 2014  
Project No. SA1245**



**Environmental Assessment**  
**MKI Labrador Sea Seismic Program, 2014–2018**  
**Addendum**

**Prepared by**

**LGL Limited**  
**environmental research associates**  
388 Kenmount Road, Box 13248, Stn. A.  
St. John's, NL A1B 4A5  
Tel: 709-754-1992  
jchristian@lgl.com  
www.lgl.com

**Prepared for**

**Multi Klient Invest AS**  
Lilleakerveien 4C, P.O. Box 251  
Lilleaker, 0216, Oslo, Norway

and

**TGS-NOPEC Geophysical Company ASA**  
1051 Clay Road  
Houston, Texas, 77043, USA

**14 July 2014**  
**Project No. SA1245**

**Suggested format for citation:**

LGL Limited. 2014. Environmental Assessment MKI Labrador Sea Seismic Program, 2014–2018 Addendum. LGL Rep. SA1245-1. Rep. by LGL Limited, St. John's, NL, for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 26 p.

# Table of Contents

	Page
Table of Contents.....	ii
List of Figures.....	iii
List of Tables .....	iii
General Comments .....	1
Canada – Newfoundland and Labrador Offshore Petroleum Board.....	1
Environment Canada – CWS.....	2
Fish, Food and Allied Workers.....	2
Nunatsiavut Government.....	3
Department of National Defence (DND).....	6
Specific Comments .....	6
Canada – Newfoundland and Labrador Offshore Petroleum Board.....	6
Environment Canada – CWS.....	10
Fisheries and Oceans Canada (DFO).....	15
Fish, Food and Allied Workers (FFAW).....	23
Literature Cited.....	26

## List of Figures

	Page
Figure 1. Ecologically and Biologically Significant Areas (EBSAs) and Sensitive Areas Overlapping or Proximate to the Project and/or Study Areas.....	17

## List of Tables

	Page
Table 1. Breeding Pairs of Pelagic Seabirds at Important Bird Areas.....	11
Table 2. Dominant Features of Ecological Importance for the Identification of Ecologically and Biologically Significant Areas (EBSAs) Overlapping the Study Area. ....	18

## GENERAL COMMENTS

### Canada – Newfoundland and Labrador Offshore Petroleum Board

**General Comment #1:** Tables 5.11, 5.16 and 5.19 have “PicketVessel” as one word.

**MKI Response:** Edit all instances of “PicketVessel” to “Picket Vessel” in Tables 5.11, 5.16 and 5.19.

**General Comment #2:** The printed copy of the EA Report should include a Table of Contents.

**MKI Response:** A Table of Contents was included in the EA (see p. i-iii). This was followed by a List of Figures (p. iv-vi) and a List of Tables (p. vii-viii).

**General Comment #3:** In order to complete the assessment of the proposed MKI AS Labrador Sea Seismic Program, 2014 to 2018, the C-NLOPB will require some additional information. This additional information is in relation to the possibility of 3D seismic activity in future years (2015-2018). The EA Report does not assess this possible 3D seismic activity. You will need to either provide the assessment of the possible 3D activities (as identified in the Project Description and EA Report) or commit to provide an amendment if 3D seismic activities are to occur in future years.

**MKI Response:** As indicated in the first paragraph of Section 1.0 (Introduction) of the Environmental Assessment (EA), 3D marine seismic surveying is included as one of the potential activities being assessed in the document. Section 2.2.8 (Seismic Streamer) of the EA indicates that as many as 16 streamers may be towed during a 3D seismic survey, resulting in a slightly larger footprint than that associated with the 12 streamer scenario which has already been used on the Newfoundland offshore. That being said, a wider streamer footprint will result in the requirement of fewer passes by the airgun array, and hence, less airgun sound being transmitted to the marine environment.

In Section 5.0 (Effects Assessment) of the EA, interactions between presence of the seismic vessel, including the associated seismic equipment, and VECs are indicated for the Fisheries VEC (see Table 5.6), the Marine Birds VEC (see Table 5.9), and the Marine Mammals/Sea Turtles VEC (see Table 5.12). Given these potential interactions, the same interaction is possible between seismic vessel/equipment presence and the Species at Risk VEC (see Table 5.17) and the Sensitive Areas VEC. While the assessment tables within the EA do not specifically mention either 2D or 3D seismic surveying, ‘airgun array’ is listed as a sound-associated Project Activity and ‘seismic vessel’ is listed as a presence-associated Project Activity, the latter including the seismic equipment associated with the seismic vessel (i.e., airgun array and streamers). This approach has been used in assessment tables for numerous past EAs and deemed acceptable by the C-NLOPB. As stated in the EA, the *reversible* residual effects of seismic vessel/equipment presence during seismic surveying on the various VECs are predicted to be *not significant*, regardless of what type of seismic survey is being conducted. Note that MKI has already committed that it will not conduct seismic survey acquisition in areas where there is concentrated commercial fishing activity. MKI will continue their ongoing dialogue with

the fishing industry and, of course, use FLOs and picket vessels during the seismic surveys to mitigate any residual effects of seismic vessel/equipment presence on the Fisheries VEC.

As indicated in the second paragraph of Section 1.0 (Introduction) and in Section 2.2.2 (Project Phases), there is the possibility that both 2D and 3D seismic surveys would be conducted by MKI within the Project Area during the same year. The potential occurrence of both 2D and 3D seismic surveys within the Project Area during the same year requires assessment of within-project cumulative effects. As indicated in Subsection 5.5.5 (Cumulative Effects) of the EA, within-Project cumulative effects (i.e., MKI conducting 2D and 3D seismic surveys within the Project Area during the same year) are fully integrated within a typical EA. Such is the case with the EA for the MKI Labrador Sea Seismic Program, 2014-2018. The residual cumulative effects of MKI conducting both 2D and 3D surveys in the Project Area during the same year are predicted to be *not significant*.

### **Environment Canada – CWS**

**General Comment #1:** Previous comments on the scoping document and project description (submitted on November 19, 2013) are still applicable to the EA Report.

**MKI Response:** As per the “previous comments” noted, the regulatory requirements outlined in *The Migratory Birds Convention Act*, *Species at Risk Act* and *Canadian Environmental Protection Act* were consulted when preparing this EA. Advice on published and unpublished literature on the seabirds of the Labrador Sea was also taken into consideration.

### **Fish, Food and Allied Workers**

**General Comment #1:** The commercial fishery is very important to the many rural communities in Newfoundland & Labrador. While the membership of the FFAW|Unifor live in communities as far north as Fish Cove Point (just north of Cartwright), our Labrador members’ fish in NAFO divisions 2G, 2H, 2J and 3K for crab, shrimp, turbot, cod, etc. As well, our harvesters in 4R (northern Newfoundland) have rights to fish in 2J, and our northeast coast fishers still have fishing rights of the coast of Labrador as well. We also have members who fish quotas for the Natuashish Government in 2H.

There is an item on utilizing a 7 day temporal pre-research survey separation that comes up in several places in the document (i.e. pgs. 156, 184). It is the understanding of FFAW|Unifor that this is being accepted by DFO when it comes to their Research Vessel Trawl Surveys, but it is not feasible to be utilized in connection with the execution of the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab. If there are further questions on these matters it would be worthwhile to communicate with the shell-fish research scientists at DFO. The reviewer is only aware of the implementation of spatial separation having been discussed in the context of any recent programs in Newfoundland & Labrador. The FFAW|Unifor is obliged to again state that any impact on either harvesting of fisheries science should be recognized as unacceptable in the Newfoundland & Labrador waters.

**MKI Response #1:** MKI commits to maintain regular communication with DFO, the FFAW, independent fishers, and managers of other key corporate fisheries in the area throughout survey



operations. Seismic surveys will be scheduled, to the extent possible, to reduce potential for impact or interference with DFO science surveys or fishing activities.

The Proponent contacted DFO regarding temporal and/or spatial separation between seismic activity and the Industry-DFO Collaborative Post-Season Trap Survey for snow crab. Owing to the current speculative nature of possible effects of seismic activity on snow crab, avoidance measures previously voiced by the FFAW (e.g., maintaining a distance of ~20 nm from crab survey stations prior to their sampling) may be viewed as a precautionary measure; however, there is currently no indication of official acceptance of avoidance protocols by DFO (E. Dawe, DFO, NL, pers. comm., 2014).

***FFAW Response to MKI Response #1:*** As per Appendix 2 of the Geophysical, Geological, Environmental and Geotechnical Program Guidelines of the C-NLOPB proponent should stay away from active fishing areas and fisheries science work to mitigate any negative impacts. The comments provided by the FFAW|Unifor are to address the uncertainties and implement the precautionary approach of influence on the fisheries and fisheries science. It is evident in the responses from the DFO Research Scientist that such precautions are warranted due to the “speculative nature of possible effects of seismic activity on snow crab”.

***MKI Response #2:*** MKI commits to maintain regular communication with DFO, the FFAW, independent fishers, and managers of other key corporate fisheries in the area throughout survey operations. As stated in Appendix 2 of the Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2012):

*a) Surveys should be scheduled, to the extent possible, to reduce potential for impact or interference with Department of Fisheries and Oceans (DFO) science surveys. Spatial and temporal logistics should be determined with DFO to reduce overlap of seismic operations with research survey areas, and to allow an adequate temporal buffer between seismic survey operations and DFO research activities.*

*b) Seismic activities should be scheduled to avoid heavily fished areas, to the extent possible. The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and local fishing interests are informed of each other’s planned activities.*

## **Nunatsiavut Government**

**General Comment #1:** Inuit depend on the marine environment for a subsistence lifestyle and for their economic livelihood, particularly in regards to the Inuit Fishery. As is the case with all seismic activity, this program could potentially have negative impacts on Labrador Inuit health and wellbeing. The Nunatsiavut Government continuously recommends that seismic activities not begin prior to September 15 of each year and is adamant that seismic activities do not disrupt the fishery, irrespective of the seismic survey plan of MKI.

The Nunatsiavut Government recommends that adaptive management be required for Project-specific or cumulative effects, whether conducted by MKI, government bodies, or in combination. This would include the implementation of contingency plans and resources to enable responsive action, especially in areas where effect predictions are uncertain and where predictive errors may have serious consequences (e.g. disruption to traditional livelihoods or Inuit Fishery).

Currently, Labrador Inuit bear the majority of the risk associated with seismic activities with few tangible benefits to the region. The Nunatsiavut Government expects the Proponent to accept a degree of responsibility for any negative changes to the Inuit Fishery and subsistence fishing, and that the burden of proof would not rest on Inuit stakeholders to demonstrate a cause and effect relationship with seismic processes and the fisheries.

Hiring, training and ensuring meaningful employment for Labrador Inuit is essential. This could be established through an employment outreach program, with defined minimum targets for Labrador Inuit hiring. Such a program should include transportation assistance and measures to address social and cultural issues including any associated language barriers, if necessary. This would also include the establishment of paid trainee positions to be in place onboard the seismic vessel in order to build capacity.

Furthermore, given that our Inuit fishers are not represented by the Fish, Food and Allied Workers Union, the Nunatsiavut Government is adamant that the Inuit Fisheries Liaison Officer be present on the seismic vessel at all times during the Project.

We also request that the Proponent support through on-going basis Nunatsiavut government businesses and service providers for the duration of their activity on the north coast of Labrador.

The Nunatsiavut Government recommends that an annual report be submitted to the C-NLOPB and the Nunatsiavut Government no later than January 31, detailing the progress and potential environmental impacts of the Project, including progress on the implementation of mitigation measures and Inuit-specific opportunities.

Potential mitigation measures could still be arranged for the 2014 MKI seismic program and the Nunatsiavut Government recommends increased communication and consultation to address the ongoing concerns of Inuit in the region. Currently, few steps have been taken by the proponent to address the potential negative impacts of seismic activity within the Labrador Inuit Settlement Zone and Inuit Fishery.

***MKI Response:*** MKI understands and respects the social, cultural, subsistence and economic relationship between the Nunatsiavummiut and their local marine resources. Local marine wildlife, particularly the fisheries, were a primary concern of the EA and of past and continuing consultations in Labrador (e.g., see Appendix 1 of the EA). As stated in Section 5.2.2 of the EA (Program Consultations), "...the most consistent issue raised during the consultations related to potential conflict with the commercial fisheries – specifically ensuring that the survey does not interfere with or otherwise impact harvesting success... Consequently, fish harvester groups and agencies were a key focus of the consultations. Other topics of discussion included potential effects on marine biota, employment opportunities, [and] the importance of ongoing communication between the Operator and potentially affected groups."

As noted in the EA, MKI is aware that any new development can have impacts, but these impacts can be effectively mitigated. MKI commits to multiple mitigation measures (see Section 5.6 of the EA) which include minimizing potential interactions between the Project and fishing/harvesting activities to the extent possible. As noted in Section 5.6: "The survey will not enter the Nunatsiavut Zone (the Tidal Waters of the Labrador Inuit Settlement Area), or within identified sensitive areas such as Gilbert Bay, Nain Bight and Hamilton Inlet, or the Hawke Channel, which is a highly concentrated fixed-gear fishing area." Also described in Section 5.6 of the EA is the central importance of "...frequent, timely and effective communications with fishing industry organizations/participants..." in order to "(1) ensure that the seismic program

does not operate in the area of active fisheries, and (2) allow the survey to plan its acquisition and proceed in the most efficient way possible in light of concurrent fishing locations.” Also, as advised, MKI will use at least two Fishery Liaison Officers (FLOs) throughout the Project to facilitate communications with Nunatsiavut and non-Inuit fishers and assist with applying these mitigations. It is intended that these FLOs will have close ties with the respective fleets and that there will be “...one FFAW representative on the seismic vessel and a representative of Inuit/Nunatsiavut interests on the picket vessel” (as stated in the EA p.152, *Fisheries Liaison Officers [FLOs]*).

With strict adherence to the above mitigation procedures of spatial and temporal avoidance, and frequent and open communication, it is anticipated that beginning a seismic program before 15 September will not disrupt the Nunatsiavut fishery. Restricting seismic activities to a period after 15 September would result in high program costs and the risk of a very short remaining acquisition season thus rendering exploration off the coast of Labrador ineffective and impracticable. The severe weather conditions and sea state typically experienced in the region beyond early fall would constitute unacceptable safety and financial risks, and compromise data quality.

The use of the Nunatsiavummiut FLO along with MKI’s commitment to constant communications and ongoing consultations with fisheries stakeholders should greatly contribute to the timely identification of immediate or cumulative unanticipated/unmitigated disruptions of traditional activities or the Inuit fishery. Open and frequent communication between MKI and Nunatsiavut representatives will enable MKI to respond with appropriate contingency plans and necessary resources. MKI would wish to immediately discuss any such disruptions with Nunatsiavut Government representatives and Nunatsiavut fishing interests (e.g., the Torngat Fish Producers Cooperative) to reach appropriate solutions. As stated in Section 5.6 of the EA (p. 156, *4. Fishing Gear Damage Program*), MKI will have a compensation program in place for any case of fishing gear damage, which “...covers any damage to fishing gear (or vessels) caused by the survey vessels or survey gear, and includes the value of any harvest lost as a direct result of an incident.” This program includes a reporting mechanism whereby undue levels or burdens of proof will not be placed on Inuit stakeholders; for example, a typical report would include information about the time and location of gear set and discovery of loss/damage, and a description of identifying markings in the case of lost gear. Incident response and reporting guidelines were detailed in Section 5.6 of the EA. If any large-scale or otherwise general negative effect on traditional activities and/or the Inuit fishery were suspected, MKI anticipates that an independent agency, such as the C-NLOPB or DFO, would need to conduct an investigation of potential causes to ensure accurate and effective measures are used.

MKI considers the employment of Nunatsiavut Inuit an important aspect of the Project, and recognizes that this was a critical concern raised during consultations in communities and with Nunatsiavut Government officials. In addition to the use of a Nunatsiavummiut FLO as described above, MKI commits to “...provide the stakeholder communities with a list of employment opportunities and inform them of the appropriate recruitment agency” (see Appendix 1 of the EA). MKI will also file a Canada-Newfoundland and Labrador Benefits Plan which must be approved by the C-NLOPB, and which “...supports the principle that first consideration be given to personnel, support and other services that can be provided within NL, and to goods manufactured in NL, where such goods and services can be delivered at a high standard of

Health, Safety and Environmental competency, be of high quality and are competitive in terms of fair market price” (see Section 1.3 and Appendix 1 of the EA). Notice of employment opportunities and identification of potential candidates for employment will be greatly facilitated through the ongoing communication between MKI and the Nunatsiavut Government.

MKI will submit a Seabird and Marine Mammal Monitoring Report after the survey is completed, which will include details of the progress/conduct of the Project, the implementation and assessment of mitigation measures, and observed biota and their behavioural reactions. While the C-NLOPB requires this report be submitted within one year of survey completion, MKI will endeavour to meet the 31 January 2015 date recommended by the Nunatsiavut Government (although submission time is dependent upon the survey conclusion date and the amount of data requiring analysis). In addition, as discussed during consultations for the Project, MKI will provide weekly briefing materials (including maps as appropriate) to the fishing industry (including, but not limited to, the Torngat Fish Producers Cooperative and Torngat Fisheries Secretariat) and the Nunatsiavut Government (see Appendix 1 of the EA).

As described in Section 5.6 of the EA, MKI has committed to numerous mitigation measures, many of which reflect recommendations derived from previous and current consultations with Nunatsiavut agencies and other local fishing interests, including the Nunatsiavut Government, Cartwright Fishers Committee, Labrador Fishermen’s Union Shrimp Company, Torngat Secretariat, Torngat Fish Producers Cooperative, Hopedale Inuit Community Government, Makkovik Inuit Community Government and Sivunivut Inuit Community Corporation, among others (see Section 4.3.1, *Information Sources*, and Appendix 1 of the EA). MKI’s policy is to consult with “...relevant agencies, stakeholders and rights-holders (e.g., beneficiaries) during the pre-survey and survey stages” and to conduct post-survey follow-up discussions (see Section 5.2.1, *MKI Consultation Policy and Approach*, of the EA). MKI will utilize this approach “...before, during and after any work for 2014-2018.”

### **Department of National Defence (DND)**

**General Comment #1:** Comments from DND’s letter dated January 27, 2014 have been reflected in the EA Report. The proponent is reminded that DND is likely to be operating in the vicinity of the study area in a non-interference manner during the project timeframe; thus, there is potential for interaction with naval operations in areas where seismic activities will occur. DND is to be kept informed of dates and locations of seismic activities.

**MKI Response:** MKI commits to informing DND regarding dates and locations of seismic activities throughout the Project.

## **SPECIFIC COMMENTS**

### **Canada – Newfoundland and Labrador Offshore Petroleum Board**

**Section 1.0 Introduction, 2<sup>nd</sup> paragraph, line 6, page 1** – If there is “*the possibility of 2D and 3D seismic surveys occurring in the same year*” then this activity should be assess as part of the project proposed.

**MKI Response:** In 2014, MKI will acquire 2D seismic data only—i.e., 2D and 3D seismic surveys by MKI will not occur simultaneously in the Project Area in 2014. The Project Area is

very large > 679,758 km<sup>2</sup> (see Figure 1.1 on page 2 of the EA) and the existing grid of acquired seismic data is extremely coarse with ~ 60 km between survey lines (on average). Additional 2D seismic infill data will be required to locate areas for possible 3D seismic surveys. Therefore, whilst it is possible that 2D and 3D seismic surveys by MKI could take place in the same year within the Project Area during 2015-2018, it is highly unlikely that these two activities would occur in close proximity to each other.

Given the anticipated spatial separation between potential 2D and 3D seismic surveys occurring in the same season, the likelihood of significant residual effects on VECs is considered minimal. See the MKI response to the C-NLOPB's General Comment #3 on page 1 of this Addendum.

**Section 2.1 Spatial and Temporal Boundaries, page 6** – While the proponent has only listed 5 “corner” coordinates, it is obvious that the Project Area in Figure 1.1 is not a pentagon-shaped polygon. The Project Area is irregularly shaped with more than 5 coordinates and the proponent needs to provide additional “corner” points.

Please provide the coordinates of the Study Area.

**MKI Response:** The following coordinates (decimal degrees, WGS84 projection) define the ‘maximum extents’ of the irregularly shaped Study Area associated with MKI’s proposed Labrador Sea Seismic Program, 2014-2018.

- Northwest: 61.112°N, 64.542°W;
- Northeast: 61.129°N, 57.326°W;
- Eastern extent: 55.001°N, 44.913°W;
- Southeast: 50.338°N, 47.930°W; and
- Southwest: 50.358°N, 54.630°W.

**Section 2.1 Spatial and Temporal Boundaries, paragraph 5, page 6** – It should be (Sikumuit 2008).

**MKI Response:** Edit “(Sikumuit 2008)” to “(Sikumiut 2008)” in Section 2.1, paragraph 5, p.6 of the EA.

**Section 2.2.6.1 Seismic Vessel, page 9** – It should be Gibraltar.

**MKI Response:** Edit “Gibraltor” to “Gibraltar” in Section 2.2.6.1, p.9 of the EA.

**Section 2.2.6.1 Seismic Vessel, page 9** – It should be Coasting.

**MKI Response:** Edit “Coasing Trade Permit” to “Coasting Trade Permit” in Section 2.2.6.1, p.9 of the EA.

**Section 4.2.1.4 Benthos, paragraph 1, page 25** – It should be bryozoans.

**MKI Response:** Edit “bryzoans” to “bryozoans” in Section 4.2.1.4, paragraph 1, p.25 of the EA.

**Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries, subsection Snow Crab, paragraph 4, page 30** – The DFO official needs to be identified here.

**MKI Response:** Replace the personal communication cited for the sentence on p.30 paragraph 4: “There are two fishery closure areas that occur in the Project Area: (1) Hawke Channel; and (2) Funk Island Deep (see Figure 4.1); both were created to offer protection to snow crab” with “(DFO 2010),” the snow crab integrated fisheries management plan 2009-2011 document.

**Section 4.4 Seabirds and Migratory Birds, paragraph 1, page 92** - The author states that, “There are over 30 species of marines birds occurring...”, but only 27 are listed in Table 4.6 and 3 are “scarce.” The table or the text needs to be corrected.

**MKI Response:** Edit “There are over 30 species of marine birds occurring regularly on the Labrador coast and the north coast of Newfoundland (Table 4.6).” to “There are twenty-seven species of marine birds occurring regularly in the Labrador coast and the north coast of Newfoundland (Table 4.6).”

**Table 4.10, page 107** – There are three instances where “palagic” is used. The reviewer assumes it is meant to be “pelagic”, if so, this needs to be corrected.

**MKI Response:** Edit all instances of “palagic” to “pelagic” in Table 4.10, p.107 of the EA.

**Section 4.6.1.2 Northern Bottlenose Whale, paragraph 2, page 128** – It should read, “The recovery goal for this population is to...”

**MKI Response:** Edit “The recovery goal for this population it to...” to “The recovery goal for this population is to...” in Section 4.6.1.2, paragraph 2, p.128 of the EA.

**Section 4.6.1.2 Northern Bottlenose Whale, paragraph 3, page 128** – It should read, (see Figure 4.43).

**MKI Response:** Edit “(se Figure 4.43)” to “(see Figure 4.43)” in Section 4.6.1.2, paragraph 3, p.128 of the EA.

**Section 4.6.1.7 Fin Whale, page 133** – “polarregions” is written as one word.

**MKI Response:** Edit “polarregions” to “polar regions” in Section 4.6.1.7, p.133 of the EA.

**Section 5.4.2 Project Area, 1<sup>st</sup> paragraph, last line, page 145** – It is stated that “*The western boundary of the Project Area is 20 km offshore of The Zone*” yet the note for the Northwest Project Area corner in Table 5.1 states “coincident with northeastern tip of ‘The Zone’”. Please explain how it can be 20 km offshore of The Zone.

**MKI Response:** Revise the sentence “The western boundary of the Project Area is 20 km offshore of The Zone” to “The northwest boundary of the Project Area is coincident with the northeastern tip of The Zone.”

**Section 5.7 Effects of the Environment on the Project, 2<sup>nd</sup> paragraph, line 9, page 162** – Please provide information on the “*wind and wave conditions*” that suspend seismic vessel surveys.

**MKI Response:** Significant wave heights of approximately 4-5 m would suspend seismic data acquisition. Wind conditions are not directly relevant.

**Section 5.8.4.1 Underwater Sound, subsection Behavioural Effects, paragraph 1, page 171** – Anecdotal information requires multiple observations (in these cases it would require multiple fish harvesters observing the same events). If it is only a single report from a fish harvester, which it appears to be, then the “anecdotal” needs to be removed and the observation by each fish harvester needs to be properly described as a single observation.

**MKI Response:** Noted.

**Section 5.8.5.2 Vessel Presence (including towed seismic equipment), page 183** – The sentence, “Because of the length of the streamers being towed behind it, the maneuverability of a seismic vessel is restricted and other vessels must give way” is not entirely correct. This is only as a last resort to failed communication and avoidance mitigation. As the proponent clearly states on page 156 that the use of a scout vessel will be used in active fishing areas there seems to be contradictory language by the proponent. This needs to be corrected.

**MKI Response:** A support vessel will be used to scout ahead of the survey vessel to determine if there are any fishing boats or gear in the area. Information regarding any sightings and radio communications will be relayed back to the survey vessel and the FLOs. In cases where the support vessel does not readily detect and have prior communication with other vessels travelling along the survey route, other vessels will need to give way.

**Section 5.8.5.2 Vessel Presence (including towed seismic equipment), line 8, page 183** – It is not clear from the statement “*the turning radius required between each track line extends the assessment area beyond the actual survey project area (but stays within the Project Area)*” that the turning radius will stay within the Project Area.

**MKI Response:** Remove the above statement from the EA. All vessel activity, including turning, will occur within the Project Area.

**Section 5.8.6.5 Presence of Vessels and Helicopters, page 192** – The title of this subsection implies that helicopter presence will be discussed, however this does not appear to be the case.

**MKI Response:** The word helicopters should be removed from this heading. Helicopters are discussed in the preceding section (Section 5.8.6.4) of the EA.

**Section 5.8.6.6 Accidental Releases, paragraph 1, page 193** – It should read, “Marine gas oil is a low sulphur, light fuel...”

**MKI Response:** Edit “Marine gas oil is a low sulphur, light fuel...” to “Marine gas oil is a low sulphur, light fuel...” in Section 5.8.6.6, paragraph 1, p.193 of the EA.

**Section 5.8.7.4 Effects of Accidental Releases, line 3, page 208** – The maximum amount of fuel potentially spilled by the seismic vessel or picket vessel should be available for discussion.

**MKI Response:** The maximum amount of potential fuel (MGO or marine gas oil) leakage from the seismic vessel *Sanco Spirit* is approximately 1100 m<sup>3</sup>.

## **Environment Canada – CWS**

**Section 4.4 Seabirds and Migratory Birds, paragraph 1, page 92** - Quote: “(2) Quaker Hat Island near Cape Harrison, (3) Gannet Islands and Bird Island in Groswater Bay/Table Bay”

These two main concentrations are not grouped correctly. Should read as follows: 2) northeast Groswater Bay and Quaker Hat Island near Cape Harrison, 3) Gannet Islands and Bird Island, 4) Table Bay, and 5) Wadham Islands and Funk Island.

**MKI Response:** Edit “There are five main concentrations of nesting auks, along these coastlines: (1) offshore islands south east of Nain, (2) Quaker Hat Island near Cape Harrison, (3) Gannet Islands and Bird Island in Groswater Bay/Table Bay, (4) Wadham Islands, and (5) Funk Island (Figure 4.41).” to “There are five main concentrations of nesting auks, along these coastlines: (1) offshore islands south east of Nain, (2) northeast Groswater Bay and Quaker Hat Island near Cape Harrison, (3) Gannet Islands and Bird Island, (4) Table Bay, and (5) Wadham Islands and Funk Island (Figure 4.41).”

**Section 4.4 Seabirds and Migratory Birds, paragraph 1, page 92** - Quote: “These five island groups support almost 660,000 pairs of breeding seabirds. More than 40% of the North American breeding population of Razorbill nests on the mid-Labrador coast alone. The Gannet Islands (including the Gannet Cluster) off Hamilton Inlet, the largest breeding seabird nesting colony in Labrador, supports more than 91,000 pairs of nesting seabirds in the summer (Table 4.7). The Wadham Islands and Funk Island, 50-100 km south of the Study Area, host over 430,000 pairs of seabirds that travel great distances on foraging sorties.”

Population numbers for seabird colonies in this report in general and Table 4.7 in particular are in large part from dated sources, and should be updated through the use of the most recent information available. Seabird colony numbers are routinely assessed and updated by EC-CWS and its partners, and data are compiled and stored in the CWS Atlantic Region Colonial Waterbird Database. These data can be obtained by contacting Sabina Wilhelm, EC-CWS colonial seabird biologist, at Sabina.wilhelm@ec.gc.ca.

**MKI Response:** Based on email correspondence dated 18 April, S. Wilhelm of CWS was unavailable to provide updated data on seabird colony numbers until the week of April 29th. Follow-up emails and phone calls were made again on 1 and 2 May; however, Dr. Wilhelm could not be reached. Updated data from other sources were utilized to revise Table 4.7 in the EA (see Table 1, below). MKI will continue to follow up with CWS to acquire further updates; however, updates to Table 1 (breeding pairs of seabirds) are not anticipated to result in changes to the effects predictions of the EA.

**Section 4.4.1 Important Bird Areas for Seabirds, paragraph 1, page 96** - Quote: “These eight IBAs contain almost 660,000 pairs of breeding seabirds of 11 species. The Gannet Islands contain the largest seabird colony on the coast of Labrador with 14,329 pairs of Razorbill (about 33% of the North American breeding population), 38,666 pairs of Atlantic Puffin, and 36,702 pairs of Common Murre (see Table 4.7).”



Population numbers for seabird colonies in this report in general and Table 4.7 in particular are in large part from dated sources, and should be updated through the use of the most recent information available. Seabird colony numbers are routinely assessed and updated by EC-CWS and its partners, and data are compiled and stored in the CWS Atlantic Region Colonial Waterbird Database. These data can be obtained by contacting Sabina Wilhelm, EC-CWS colonial seabird biologist, at Sabina.wilhelm@ec.gc.ca.

**MKI Response:** Based on email correspondence dated 18 April, S. Wilhelm of CWS was unavailable to provide updated data on seabird colony numbers until the week of April 29th. Follow-up emails and phone calls were made again on 1 and 2 May; however, Dr. Wilhelm could not be reached. Updated data from other sources were utilized to revise Table 4.7 in the EA (see Table 1, below). MKI will continue to follow up with CWS to acquire further updates; however, updates to Table 1 (breeding pairs of seabirds) are not anticipated to result in changes to the effects predictions of the EA.

**Table 1. Breeding Pairs of Pelagic Seabirds at Important Bird Areas.**

Species	Number of Nesting Pairs								
	Southeast of Nain	Quaker Hat	Northeast Groswater Bay	Gannet Islands	Bird Island	Northern Groais Island	Wadham Islands	Funk Island	Total
Northern Fulmar	-	-	-	16	-			13	29
Leach's Storm-Petrel	-	-	10	20	present		10,000		10,030+
Northern Gannet								6,075	6,075
Herring Gull	-	-	present		-			500	500+
Glaucous Gull	350	-	-	-	-				350
Great Black-backed Gull	-	-	100	120	20			100	340
Black-legged Kittiwake	-	4 <sup>a</sup>	-	113	-	2,400		810	3,323
Common Murre	2,260	- <sup>a</sup>	2,060 <sup>a,b</sup>	36,702 <sup>a</sup>	3,100			396,000	440,122
Thick-billed Murre	8,000	126 <sup>a</sup>	365 <sup>a,b</sup>	1,897 <sup>a</sup>	present			250	10,767+
Razorbill	815	- <sup>a</sup>	3,714 <sup>a,b</sup>	14,329 <sup>a</sup>	1,530		273 <sup>c</sup>	200	20,861
Black Guillemot	341	-	present	110	-		25		476+
Atlantic Puffin	12,240	- <sup>a</sup>	17,404 <sup>a,b</sup>	38,666 <sup>a</sup>	8,070		15,950	2,000	176,855
Totals	24,006	130	23,653+	91,973	12,720+	2,400	26,248	405,948	587,078

Sources: Important Bird Areas of Canada ([www.ibacanada.ca](http://www.ibacanada.ca)); <sup>a</sup> CWS unpublished data; <sup>b</sup> Robertson et al. 2002; <sup>c</sup> Robertson and Elliot 2002.

**Section 4.4.2 Distribution and Abundance, paragraph 1, page 96** - Quote: “The seabird colonies at The Gannet Islands and Funk Island are exceptions.”

Attached are two EC-CWS technical reports that can provide updated trend information on seabirds breeding in Groswater Bay and on one of the Wadham Islands. Additional more recent data for these and other colonies within the study area exist and are available upon request from EC-CWS.

Robertson, G. J. and R. D. Elliot. 2002. Changes in seabird populations breeding on Small Island, Wadham Islands, Newfoundland. Canadian Wildlife Service Technical Report Series No. 381. Atlantic Region. iii + 26 p.

Robertson, G. J., R. D. Elliot, and K. G. Chaulk. 2002. Breeding seabird populations in Groswater Bay, Labrador, 1978 and 2002. Canadian Wildlife Service Technical Report Series No. 394. Atlantic Region. iv + 31 p.

**MKI Response:** These technical reports have been reviewed and numbers of breeding pairs were adjusted in Table 1 (above) where required.

**Section 4.4.2 Distribution and Abundance, paragraph 1, page 96** - It should be noted in this section that the ECSAS program is ongoing, and a current focus on ECSAS monitoring is the Labrador Sea. Please see the attached report (Tranquilla et al. in press) for updated information in the region.

**MKI Response:** Add the following text at the end of paragraph 1, Section 4.4.2, p.96:

“The ECSAS program is ongoing, with a current focus on ECSAS monitoring in the Labrador Sea. New information on birds of the Labrador Sea will be available in the coming years.”

**Section 4.4.2.8 Alcidae (Murre, Black Guillemot, Atlantic Puffin, Razorbill, and Dovekie), paragraph 1, page 101** - Quote: “Common Murre breeds in large colonies on the mid-Labrador coast with a total of 47,000 pairs at five main colonies (see Table 4.7).”

Population numbers for seabird colonies in this report in general and Table 4.7 in particular are in large part from dated sources, and should be updated through the use of the most recent information available. Seabird colony numbers are routinely assessed and updated by EC-CWS and its partners, and data are compiled and stored in the CWS Atlantic Region Colonial Waterbird Database. These data can be obtained by contacting Sabina Wilhelm, EC-CWS colonial seabird biologist, at Sabina.wilhelm@ec.gc.ca.

**MKI Response:** Based on email correspondence dated 18 April, S. Wilhelm of CWS was unavailable to provide updated data on seabird colony numbers until the week of April 29th. Follow-up emails and phone calls were made again on 1 and 2 May; however, Dr. Wilhelm could not be reached. Updated data from other sources were utilized to revise Table 4.7 in the EA (see Table 1, below). MKI will continue to follow up with CWS to acquire further updates; however, updates to Table 1 (breeding pairs of seabirds) are not anticipated to result in changes to the effects predictions of the EA.

**Section 4.4.2.8 Alcidae (Murre, Black Guillemot, Atlantic Puffin, Razorbill, and Dovekie), paragraph 2, page 102** - Quote: “About 43% (18,526 pairs) of the North American breeding population of Razorbill nests on the mid-section of Labrador coast (see Table 4.7). Most of these (14,329 pairs) are on The Gannet Islands (CWS unpubl. data).”

Population numbers for seabird colonies in this report in general and Table 4.7 in particular are in large part from dated sources, and should be updated through the use of the most recent information available. Seabird colony numbers are routinely assessed and updated by EC-CWS and its partners, and data are compiled and stored in the CWS Atlantic Region Colonial Waterbird Database. These data can be obtained by contacting Sabina Wilhelm, EC-CWS colonial seabird biologist, at Sabina.wilhelm@ec.gc.ca.

**MKI Response:** Based on email correspondence dated 18 April, S. Wilhelm of CWS was unavailable to provide updated data on seabird colony numbers until the week of April 29th. Follow-up emails and phone calls were made again on 1 and 2 May; however, Dr. Wilhelm could not be reached. Updated data from other sources were utilized to revise Table 4.7 in the EA (see Table 1, below). MKI will continue to follow up with CWS to acquire further updates; however, updates to Table 1 (breeding pairs of seabirds) are not anticipated to result in changes to the effects predictions of the EA.

**Section 4.4.2.8 Alcidae (Murre, Black Guillemot, Atlantic Puffin, Razorbill, and Dovekie), paragraph 4, page 102** - Quote: “Black Guillemot breeds on both sides of the Atlantic, north into Arctic waters. It nests in numerous small colonies on coastal headlands and many small rocky islands. Population size estimates are difficult to achieve because nesting occurs in hard to access rock crevices. Black Guillemot is partially migratory but remains as far north as there is open water. Unlike the other members of the Alcidae, it feeds near shore and is rarely found more than a few kilometres from shore or pack ice. Black Guillemot is a year round resident on the coast of Labrador.”

Population numbers for seabird colonies in this report in general and Table 4.7 in particular are in large part from dated sources, and should be updated through the use of the most recent information available. Seabird colony numbers are routinely assessed and updated by EC-CWS and its partners, and data are compiled and stored in the CWS Atlantic Region Colonial Waterbird Database. These data can be obtained by contacting Sabina Wilhelm, EC-CWS colonial seabird biologist, at Sabina.wilhelm@ec.gc.ca.

It is important to highlight in this section that the Nain area of Labrador hosts high concentrations of Black Guillemots. This is in contrast to the generally low densities found along the rest of the coasts of Newfoundland and Labrador.

**MKI Response:** Revise paragraph 4, Section 4.4.2.8, p.102 in the EA to the following:

“Black Guillemot breeds on both sides of the Atlantic, north into Arctic waters. It nests in numerous small colonies on coastal headlands and many small rocky islands. Population size estimates are difficult to achieve because nesting occurs in hard to access rock crevices. Relatively high numbers of Black Guillemots nest in the Nain area (Table 4.7). Black Guillemot is partially migratory but remains in areas of open water in the north. Unlike the other members of the Alcidae, it feeds near shore and is rarely found more than a few kilometres from shore or pack ice. Black Guillemot is a year round resident on the coast of Labrador.”

**Section 4.6 Species at Risk, subsection 4.6.1.4 Ivory Gull, page 129,** The Ivory Gull recovery strategy has been finalized and is currently available at the Species at Risk Registry.

(See [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=50](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=50)).

**MKI Response:** Add the following text after the first sentence in Section 4.6.1.4, p.129 of the EA:

“An Ivory Gull recovery strategy has been prepared by Environment Canada (Environment Canada 2014).”

**Section 5.8.6.1 Vessel Lights, page 188,** Change from “migratory bird salvage permit” to “live seabird handling permit”.

**MKI Response:** Edit “migratory bird salvage permit” to “live seabird handling permit” in the last paragraph of Section 5.8.6.1.

**Section 5.8.6.4 Sound, page 192,** Change magnitude of effects from “negligible to low” to “uncertain”, to reflect follow-up statements later in this section which indicate that it is uncertain what the effects of sound on seabirds are.

**MKI Response:** While effects of underwater sound on birds is not well known, the limited available information and general observations indicate the magnitude of the effects would likely be “*negligible to low*” and not likely *medium* or *high*. In accordance with standard practice, there is currently no “uncertain” magnitude of effects category; therefore it is not necessary to alter the text in the EA.

**Section 5.8.6.5 Presence of Vessels and Helicopters, page 192** Aircraft, particularly helicopters, have been known to cause significant negative impacts to migratory birds during various life stages (i.e. chick rearing, moulting). Mitigation measures such as timing and adjusting the altitude and pattern of helicopter flight lines can minimize disturbance. Helicopter use near seabird breeding colonies should be avoided from May 1<sup>st</sup> - August 31<sup>st</sup> (with an end-date of September 30<sup>th</sup> for Northern Gannet Colonies).

**MKI Response:** Add the following text prior to the last sentence in Section 5.8.6.5, p.192 of the EA:

“Helicopters can have a negative impact on nesting seabirds. The Seabird Ecological Reserve Regulation under the Wilderness and Ecological Reserves Act states that aircraft may be no closer than 300 m from a Seabird Ecological Reserve during the nesting season. Gannet Islands Ecological Reserve is located in Groswater Bay with a nesting season time period of 1 May to 31 August. See Environment Canada’s guidelines to avoid disturbance to seabird and waterbird colonies in Canada for further information, found at <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=E3167D46-1>.”

**Section 5.8.6.6 Accidental Releases, page 193** We recommend a commitment to using solid streamers instead of liquid streamers. If liquid streamers are used, a contingency plan for mitigating potential leaks in the streamers must be made. Please consult O’Hara and Morandin (2010; attached) for information regarding the effects that even very small quantities of oil can have on thermoregulatory ability in migratory birds.

**MKI Response:** MKI will only use solid streamers.

### **Fisheries and Oceans Canada (DFO)**

**Section 4.3 Fisheries, page 45** - There is a recreational groundfish fishery as well as Aboriginal groundfish fisheries for food, social and ceremonial purposes primarily adjacent to and in nearshore waters of the study area.

**MKI Response:** Traditional, Aboriginal and recreational fisheries were discussed in reference to Labrador waters in general in Sections 4.3.4 and 4.3.5 of the EA, based largely on consultations conducted for the Labrador Shelf SEA (Sikumiut 2008); however, it is noted that recreational and Aboriginal (food, social and ceremonial purpose) groundfish fisheries primarily occur adjacent to and in nearshore waters of the Study Area.

**Section 4.5, Table 4.10, page 107** - When referring to SARA-listed species the population should also be identified. Please note that Schedule 1 of the *Species At Risk Act* is the official list of SARA species. Schedules 2 and 3 identify species to be reassessed by COSEWIC using revised criteria when SARA came into effect. Table 4.10 should be amended to delete the wording "Schedule 3 Special Concern" and "Schedule 2 Threatened" from the SARA Status column for Humpback Whale and Harbour Porpoise respectively.

**MKI Response:** The populations for SARA-listed species in Table 4.10 were in reference to populations that occur within the Study Area. In cases where there is more than one population for a particular species within the Study Area, it was noted in the footnotes for Table 4.10. Species are listed under SARA on Schedules 1 to 3 with only those designated as *endangered* or *threatened* on Schedule 1 having immediate legal implications. Nonetheless, attention must be paid to all of the SARA-listed species because of their sensitivities to perturbation and the potential for status upgrades. Schedule 1 is the official legal list of wildlife Species at Risk in Canada. Once a species/population is designated, the measures to protect and recover it are implemented. Schedules 2 and 3 of SARA identify species that were designated "at risk" by COSEWIC prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1. As of 22 April 2014, NW Atlantic harbour porpoise was still listed as Schedule 2 "threatened" on the SARA website, albeit "special concern" by COSEWIC. Similarly, NW Atlantic humpback whale was still listed as Schedule 3 "special concern" by SARA while "not at risk" by COSEWIC.

**Section 4.6, Table 4.13, pages 125 and 126** - The title of this table should be revised to "*SARA-listed and COSEWIC-assessed Marine Species that May Occur in the Study Area*" as species are assessed by COSEWIC, not listed. When referring to SARA listed species the population should also be identified. Populations of Atlantic salmon should be listed separately as noted on the SARA Registry. Hood Seal and Harp Seal are both high priority candidate species, and Sperm Whale is a mid-priority candidate species under COSEWIC and the applicable sections of Table 4.13 should be amended accordingly.

**MKI Response:** Similar to the previous comment, the populations for SARA-listed species in Table 4.13 were in reference to populations that occur within the Study Area. In cases where there is more than one population for a particular species within the Study Area, it was noted in parentheses with the species name (e.g., Fin whale [Atlantic population]; Atlantic cod [NL population]). Atlantic salmon is an exception, as there are many populations of this species within the Study Area. In this particular case, Atlantic salmon is noted to contain "various populations" which includes: the Labrador population, northeast Newfoundland population,

Quebec eastern north shore population, and more. Since Atlantic salmon may migrate long distances and different populations may intermingle with one another, the populations have been consolidated for the purposes of listing the status of Atlantic salmon under *SARA* and *COSEWIC*.

Revise the title of Table 4.13 to read “*SARA*-listed and *COSEWIC*-assessed Marine Species that May Occur in the Study Area.” Amend Table 4.13 and associated text to reflect that *COSEWIC* has assessed hood seal and harp seal as high priority candidate species and sperm whale as a mid-priority candidate species.

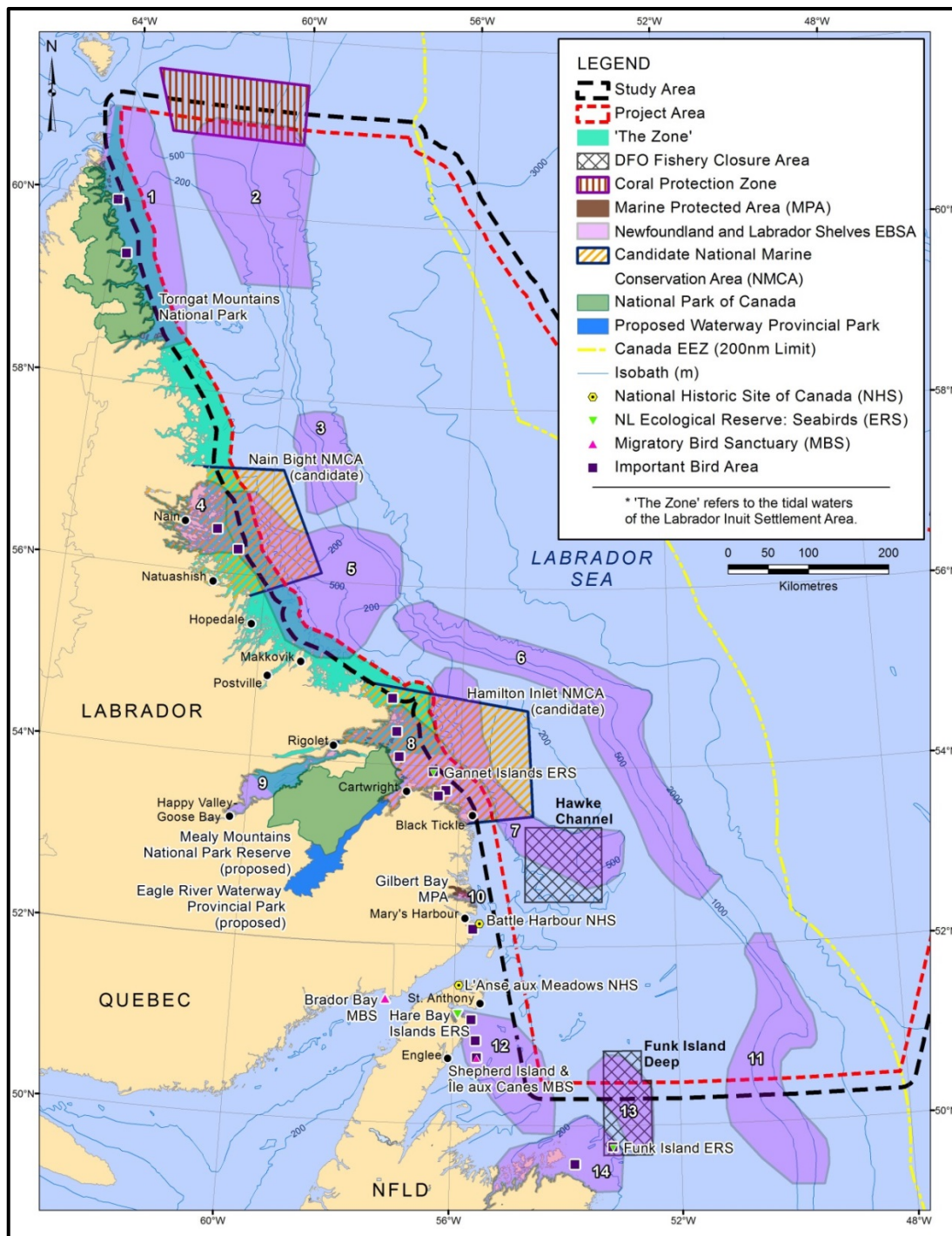
**Section 4.7 Sensitive Areas, page 136** - This section makes no reference to the recent delineation of Ecologically and Biologically Significant Areas (EBSAs) in the NL Shelves Bioregion as described in Canadian Science Advisory Secretariat (CSAS) Document “*DFO. 2013. Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) within the Newfoundland and Labrador Shelves Bioregion. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/048.*” Some of the is EBSAs described in this document lie in part within the Project / Study area and should be included in the listing and/or description of Sensitive Areas presented within Section 4.7 and Section 5.8.9 of the EA report.

***MKI Response:*** Add the following text to the end of Section 4.7 of the EA:

“DFO has also recently identified 15 Ecologically and Biologically Significant Areas (EBSAs) in the NL Shelves Bioregion, of which 14 are spatially defined (DFO 2013). The designation of EBSAs is a tool to allow appropriate management of “geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics” (DFO 2013). Eleven of these EBSAs occur either entirely or partially within the Study Area (see Figure 1), including:

- Northern Labrador;
- Outer Shelf Saglek Bank;
- Outer Shelf Nain Bank;
- Nain Area;
- Hopedale Saddle;
- Labrador Slope;
- Labrador Marginal Trough;
- Hamilton Inlet;
- Grey Islands;
- Notre Dame Channel; and
- Orphan Spur.

Unlike EBSAs within the Placentia Bay-Grand Banks Large Ocean Management Area (PBGB LOMA; see DFO 2007), priority ratings based on uniqueness, aggregation, fitness consequences and sensitivity have not yet been assigned for the 11 EBSAs listed above. The dominant features leading to the identification of these EBSAs are presented below (Table 2).



- Notes:
- |                             |                        |
|-----------------------------|------------------------|
| 1. Northern Labrador        | 8. Hamilton Inlet      |
| 2. Outer Shelf Saglek Bank  | 9. Lake Melville       |
| 3. Outer Shelf Nain Bank    | 10. Gilbert Bay        |
| 4. Nain Area                | 11. Orphan Spur        |
| 5. Hopedale Saddle          | 12. Grey Islands       |
| 6. Labrador Slope           | 13. Notre Dame Channel |
| 7. Labrador Marginal Trough | 14. Fogo Shelf         |

**Figure 1. Ecologically and Biologically Significant Areas (EBSAs) and Sensitive Areas Overlapping or Proximate to the Project and/or Study Areas.**

**Table 2. Dominant Features of Ecological Importance for the Identification of Ecologically and Biologically Significant Areas (EBSAs) Overlapping the Study Area (DFO 2013).**

<b>EBSA</b>	<b>Location</b>	<b>Ecological Importance</b>
Northern Labrador	Cape Chidley to just south of Saglek Bay along the coast; extends offshore to include part of Saglek Bank.	<p>Important migratory area for beluga (eastern Hudson Bay population; <i>endangered</i>: COSEWIC). Important summer/early fall polar bear (<i>special concern</i>: SARA [Schedule 1] and COSEWIC) habitat for feeding and migration, and summer ringed seal feeding and haul out (primary summer prey of polar bears in the region).</p> <p>Important coastal area for <i>special concern</i> waterfowl: Harlequin Duck and Barrow's Goldeneye (<i>special concern</i>: SARA [Schedule 1] and COSEWIC). Aggregations of Glaucous Gull and Common Eider.</p> <p>Important rearing and feeding area for Arctic charr.</p>
Outer Shelf Saglek Bank	Outside edge of Saglek Bank; northern parts of outer shelf and Labrador Slope extending beyond Saglek Bank; extends from 200 to 2,000 m isobaths.	<p>Aggregations of marine mammals, including harp and hooded seals (summer feeding), and northern bottlenose whale (<i>special concern</i> [Davis Strait-Baffin Bay-Labrador Sea population]: COSEWIC) and sperm whale (migration and feeding).</p> <p>High concentrations of Ivory Gull (<i>endangered</i>: SARA [Schedule 1] and COSEWIC) and various other seabird species.</p> <p>High concentrations of roundnose grenadier (<i>endangered</i>: COSEWIC; north).</p> <p>High concentrations of sea pens (northwest) and small gorgonian corals and sponges (along slope).</p>
Outer Shelf Nain Bank	Outer shelf and Labrador Slope area adjacent to Nain Bank (~200 to 2,000 m isobaths).	<p>Important feeding area for hooded seals (juveniles: Aug-Feb; adults: year-round).</p> <p>Aggregations of numerous seabird species, including Ivory Gull (<i>endangered</i>: SARA [Schedule 1] and COSEWIC).</p> <p>High concentrations of various fish species.</p> <p>High concentrations of black corals and stony cup corals (south).</p>



EBSA	Location	Ecological Importance
Nain Area	Includes five bays (Webb, Tikkoatakak, Nain, Anaktalik and Voisey's) that converge along Labrador coastline; drainage basin for Fraser River.	<p>Land fast ice important as overwintering and breeding area for ringed seals, feeding area for polar bears, wolves, foxes and other scavengers, and migration/seasonal travel corridor for species such as caribou and terrestrial predators.</p> <p>Important area for seabird colonies, including Common Eider and Thick-billed Murre. Hosts one of the largest congregations of Glaucous Gull in the region.</p> <p>Important spawning area for capelin (beach) and salmon. Highly productive area for Arctic charr (juvenile rearing; juvenile and adult feeding). Aggregations of various groundfish, pelagic fish, shellfish and aquatic plants.</p>
Hopedale Saddle	Inner shelf and Labrador Marginal Trough adjacent to Nain Area EBSA; extends southward to partially include Makkovik Bank; extends offshore to include Hopedale Saddle.	<p>Overwintering area for eastern Hudson Bay beluga population (<i>endangered</i>: COSEWIC).</p> <p>Aggregations of various seabird species, including Ivory Gull (<i>endangered</i>: SARA [Schedule 1] and COSEWIC).</p> <p>High densities of several fish species, including skates (e.g., thorny skate, <i>special concern</i>: COSEWIC), Atlantic (<i>special concern</i>: SARA [Schedule 1] and COSEWIC) and spotted wolffish (<i>threatened</i>: SARA [Schedule 1] and COSEWIC), roundnose grenadier (<i>endangered</i>: COSEWIC), redfish (e.g., deepwater redfish, <i>threatened</i>: COSEWIC), and shrimp and Greenland halibut (commercial species).</p> <p>High concentrations of sea pens (particularly ~400 m isobath), soft corals and small gorgonians (deeper waters, offshore edge).</p>
Labrador Slope	Slope from 400 to 2,000 m isobaths; extends from outer edge of Makkovik Bank southward along slope to outer edge of Belle Isle Bank.	<p>Important area for hooded seal (juveniles and females).</p> <p>Important feeding area for numerous seabird species.</p> <p>High densities of numerous fish and invertebrate species, including Atlantic (<i>special concern</i>: SARA [Schedule 1] and COSEWIC), spotted and northern wolffish (<i>threatened</i>: SARA [Schedule 1] and COSEWIC), roundnose grenadier (<i>endangered</i>: COSEWIC), skates (e.g., thorny skate, <i>special concern</i>: COSEWIC), redfish (e.g., deepwater redfish, <i>threatened</i>: COSEWIC), Atlantic cod (<i>endangered</i>: COSEWIC), American plaice (<i>threatened</i>: COSEWIC), and shrimp and Greenland halibut (commercial species).</p> <p>High concentrations of corals (north: soft and black corals; south: soft corals) and sponges (near Hamilton Spur).</p>

EBSA	Location	Ecological Importance
Labrador Marginal Trough	Extends from Cartwright Saddle south through Labrador Marginal Trough, and into Hawke Saddle (just inside Hamilton Bank).	<p>Important whelping and feeding area for harp seal (middle, trough area). Aggregations of feeding cetaceans (fall).</p> <p>Important area for several seabird species, including Ivory Gull (<i>endangered</i>: SARA [Schedule 1] and COSEWIC).</p> <p>Important area for American plaice (<i>threatened</i>: COSEWIC) and commercial invertebrate and fish species, including shrimp, snow crab, Greenland halibut, witch flounder and capelin.</p>
Hamilton Inlet	Coastal and inner shelf area (~to the outer 200 m isobaths) outside of Hamilton Inlet, Sandwich Bay, and Black Tickle-Domino on Island of Ponds.	<p>Important whelping area (pack ice) for harp seal, and fall/winter feeding area for ringed seal (western portion).</p> <p>Aggregations of several bird species, particularly Atlantic Puffin and Razorbill. Important area for Harlequin Duck (<i>special concern</i>: SARA [Schedule 1] and COSEWIC).</p> <p>Important spawning/habitat areas for capelin and Atlantic salmon.</p> <p>Occurs at outflow of Lake Melville: drains most of Labrador plateau and provides nutrients critical for primary productivity blooms; annual formation of polynyas (large, productive open water areas surrounded by sea ice).</p>
Grey Islands	East of Newfoundland's northern peninsula; includes coastal areas surrounding Grey Islands; extends inshore (including part of Hare Bay) and southeast along the inner shelf to the Fogo Shelf EBSA.	<p>High concentrations of diverse waterfowl and seabirds, including Harlequin Duck (<i>special concern</i>: SARA [Schedule 1] and COSEWIC) and Common Eider. Important breeding area for Great Black-Backed Gull, Herring Gull and terns.</p> <p>Aggregations of various groundfish, pelagic fish and shellfish.</p> <p>High concentrations of soft corals and small gorgonians (inner shelf area).</p>
Notre Dame Channel	Extends offshore from Notre Dame Bay towards Labrador Slope; branches southward along inner edge of Funk Island Bank; only includes southeast branch of Channel, between Fogo Shelf area and Funk Island Bank.	<p>Important feeding and migration area for cetaceans, including harp seal (winter).</p> <p>Important area for several seabird species.</p> <p>High densities of skates (including smooth and thorny skates, <i>endangered</i> and <i>special concern</i> [respectively]: COSEWIC), American plaice (<i>threatened</i>: COSEWIC), and commercial invertebrate and fish species, including shrimp, snow crab, Greenland halibut and capelin. Witch Flounder and redfish (e.g., deepwater redfish, <i>threatened</i>: COSEWIC) have been noted to occur in the area.</p>

EBSA	Location	Ecological Importance
Orphan Spur	Extends along Labrador Slope and Outer Shelf in NAFO Div. 3K; includes Orphan Spur and part of Trinity Trough Mouth Fan; northern portion extends from 400 to 2,000 m isobaths; southern portion max. depth ~1,000 m.	<p>Important area for several marine mammal species.</p> <p>Important area for numerous seabird species.</p> <p>Important area for several shark species. American Plaice (<i>threatened</i>: COSEWIC), Atlantic cod (<i>endangered</i>: COSEWIC), redfish (e.g., deepwater redfish, <i>threatened</i>: COSEWIC), Atlantic (striped; <i>special concern</i>: SARA [Schedule 1] and COSEWIC), spotted and northern wolffish (<i>threatened</i>: SARA [Schedule 1] and COSEWIC), skates (e.g., thorny skate, <i>special concern</i>: COSEWIC), roundnose grenadier (<i>endangered</i>: COSEWIC), and witch flounder have been noted to occur in the area.</p> <p>Coral bycatch recorded up to 1,300 m depth.</p>

Sources: DFO 2013; SARA website ([http://www.sararegistry.gc.ca/default\\_e.cfm](http://www.sararegistry.gc.ca/default_e.cfm)) (as of 16 April 2014); COSEWIC website ([http://www.cosepac.gc.ca/eng/sct5/index\\_e.cfm](http://www.cosepac.gc.ca/eng/sct5/index_e.cfm)) (as of 16 April 2014).

The *Oceans Act* provides the Minister of Fisheries and Oceans with a leadership role for coordinating the development and implementation of a federal network of MPAs, which can include areas that have yet to be developed within the Region. Therefore, there remains potential for further identification of EBSAs and other sensitive areas within the Study Area.”

Section 5.8.9 encompasses both the EA’s original content and the above additions in a general context; therefore, the original text in this section still stands and does not require further revision.

**Section 4.7, Table 4.14, page 139-140** -The description of Hamilton Inlet Candidate NMCA presented in Table 4.14 is the same as that provided for the Nain Bight candidate NMCA. It is recommended that the proponent contact Parks Canada Agency for clarification on the description and status of candidate NMCA sites and amend Table 4.14 accordingly.

**MKI Response:** Revise the Description text in Table 4.14, Section 4.7, to the following for the Nain Bight Candidate National Marine Conservation Area:

“This candidate area lies offshore the community of Nain and extends seaward from Nain to include part of Nain Bank (F. Mercier, Parks Canada, QC, pers. comm., 2013), and has substantial overlap with the Study and Project Areas.

This coastal area features two main physiographical types: sloping bedrock shores on the outer coast and the sides of fjords and channels, and broad intertidal flats with boulder barricades in sheltered areas. Exposed inshore areas feature gravel, cobble or boulder substrate, with mud and coarser sediment in sheltered subtidal areas. Offshore islands consist of bare granitic rock with scattered patches of tussock grasses (CPAWS-NL 2009). The nearshore coastal trough, offshore bank and associated oceanographic features lead to increased biological productivity in the area (F. Mercier, Parks Canada, QC, pers. comm., 2013). This area contains diverse biota, including

numerous species of seabirds and marine invertebrates, fish and mammals. Species at risk inhabiting the area include Harlequin Duck, Peregrine Falcon, Atlantic cod, and polar bear. This area also supports large numbers of nesting and moulting seabirds (CPAWS-NL 2009).

This area is within a DFO Fisheries Conservation Closed Area related to salmon fishing and conservation, with restrictions on the use of gill and trap nets (CPAWS-NL 2009).”

Revise the Description text in Table 4.14, Section 4.7, to the following for the Hamilton Inlet Candidate National Marine Conservation Area:

“This candidate area extends seaward east from Lake Melville and Sandwich Bay to Hamilton Bank, and includes the communities of Rigolet and Cartwright (CPAWS-NL 2009; F. Mercier, Parks Canada, QC, pers. comm., 2013). This area has substantial overlap with the Study and Project areas.

Coastal and marine ecosystems in the area include estuaries, intertidal flats, wetlands, coastal plains, sand dunes, offshore islands and the open ocean (CPAWS-NL 2009); upwelling and eddies offshore result in high productivity and abundant fish and marine life, including a variety of corals (F. Mercier, Parks Canada, QC, pers. comm., 2013). Species at risk in the area include Harlequin Duck, Peregrine Falcon, Barrow’s Goldeneye, Eskimo (Northern) Curlew (possibly extinct), Ivory Gull, Atlantic (striped), northern and spotted wolffish, leatherback sea turtle, blue whale, and polar bear (CPAWS-NL 2009). An abundance of breeding, staging and moulting seabirds (including most of the North American population of Razorbill and Harlequin Duck) are also found here (F. Mercier, Parks Canada, QC, pers. comm., 2013).

This area is within a DFO Fisheries Conservation Closed Area related to salmon fishing and conservation, with restrictions on the use of gill and trap nets (CPAWS-NL 2009).”

**Section 5.6 Mitigations, page 150** - The proponent should be required to adhere to all relevant minimum mitigations outlined in the SOCP including the Planning Seismic Surveys, Safety Zone and Start-up, Shut-down of Air Source Array(s), Line Changes and Maintenance Shut-downs, Operations in Low Visibility and Additional Mitigative Measures and Modifications sections of the SOCP. The measures proposed to avoid interference with fisheries science surveys appear adequate. DFO did not specifically prescribe the temporal and spatial separation measures outlined in section 5.6 (3).

**MKI Response:** MKI will follow the guidelines in the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP)* as noted on page 3 of the EA (section 1.1, last paragraph). It is unclear which minimum requirements DFO is referencing in their above comment. MKI will follow established monitoring and mitigation procedures for seismic programs offshore Newfoundland and Labrador, including several mitigation measures that go above and beyond the minimum requirements in the SOCP.

**Section 5.8.8 Species at Risk VEC, page 209** - The document, *“Recovery Strategy for Northern Wolfish (Anarhichas denticulatus) and Spotted Wolfish (Anarhichas minor), and Management Plan for Atlantic Wolfish (Anarhichas lupus) in Canada”* should be referenced in this section.

**MKI Response:** The draft version of the document, “Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada” is cited as Kulka et al. (2007).

Note that Kulka et al. (2007) was cited in Section 4.6 and Section 4.6.1.6. As indicated in Kulka et al. (2007), one of the recommended recovery actions is to identify and mitigate impacts of human activities on wolffishes. These human activities include oil and gas activities. The seismic survey-related mitigations that apply to the Fish and Fish Habitat VEC (see Section 5.8.4 of the EA) also apply to the three wolffish species. Considering the typical deep-dwelling habits of these fishes and the fact that they do not have swim bladders, potential significant effects of exposure to airgun sound (key activity with most potential to cause effect) on the wolffishes are unlikely. Not having a swim bladder means that wolffishes rely primarily on the detection of particle motion rather than sound pressure. The particle motion component of sound attenuates much more quickly than the sound pressure component so wolffishes on or near the sea bottom should not be affected by the airgun discharges.

### **Fish, Food and Allied Workers (FFAW)**

**Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries, subsection Snow Crab, page 31** - In recent commentary from the DFO, it has been indicated that there is greater confidence in the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab than there is in the Trawl Surveys.

**MKI Response:** DFO has indicated that there was greater confidence in the Industry-DFO Collaborative Post-Season Trap Survey than there was in the Trawl Surveys for snow crab as seen in recent trends in survey indices for Div. 3LNO (E. Dawe, DFO, NL, pers. comm., 2014). However, the above general comment does not apply to all NAFO Divisions within the Study Area—particularly Div. 2J, where the Trawl Survey may be more reliable than the Trap Survey. Also, this may not be indicative of future trends in survey indices in Div. 3LNO (E. Dawe, DFO, NL, pers. comm., 2014).

**Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries, subsection Atlantic Cod, page 36** - Separately identified cod stocks in Newfoundland and Labrador are also found in 3Ps, 3Pn and 4RS. In light of the discussion already including stocks that are outside the purview of the project area, all others should be included.

**MKI Response:** The statement “For management purposes, cod in this population are treated as three separate stocks by DFO: (1) northern Labrador cod (NAFO Divisions 2GH), (2) “northern cod” i.e., those found off southeastern Labrador, the northeast Newfoundland Shelf, and the northern half of Grand Bank (NAFO Divisions 2J3KL, and (3) southern Grand Bank cod (NAFO Divisions 3NO).” should be amended to include cod stocks in 3Ps, 3Pn, and 4RS. Therefore revise this statement to “For management purposes, cod in this population are treated as five separate stocks by DFO: (1) northern Labrador cod (NAFO Divisions 2GH), (2) “northern cod” i.e., those found off southeastern Labrador, the northeast Newfoundland Shelf, and the northern half of Grand Bank (NAFO Divisions 2J3KL, (3) southern Grand Bank cod (NAFO Divisions 3NO), (4) southern Newfoundland cod (3Ps), and (5) northern Gulf cod (4RS3Pn).”

**Section 4.3.3.1 Historical Fisheries, page 48** - In the context of the changing composition of the commercially harvested species, it is worth to note how there have been changes to the environmental regime that impacts the species composition, independent of the harvesting activity.

*MKI Response #1:* Noted. Shifts in environmental conditions favoring crustaceans (e.g., colder water temperature) and swift decreases in groundfish predators from declines in Newfoundland and Labrador's groundfish stocks in the early 1990s resulted in rapid growth of crustacean populations such as northern shrimp and snow crab.

All fish have physiological limits within which they can survive, such as sea temperatures and salinities (Rose 2005). Frank et al. (1990) analyzed the effects of changes in oceanographic conditions induced by a global increase in atmospheric CO<sub>2</sub>, and their models predicted a general warming and freshening of the continental shelf waters, leading to shifts in the geographic distribution of important commercial groundfish stocks, earlier arrival times and later departures for highly migratory large pelagics, and – in combination with increased water column stratification – decreased organic material reaching the seabed. Rose (2005) inferred that capelin and Atlantic herring react strongly and quickly to climate change, owing to their physiological limits and potential for fast population growth; this was verified through the examination of historical data from Icelandic and Greenland waters, which warmed considerably during 1920 to 1940, resulting in capelin, Atlantic herring, Atlantic cod, and other species shifting north very quickly.

*FFAW Response to MKI Response #1:* The nature of the comment provide by the reviewer was in fact to establish that the reverse of what is being explained happened in the 1990s is happening now.

*MKI Response #2:* MKI notes that there has been a general warming of the oceanic waters off Newfoundland and Labrador during recent years. MKI also notes that there has been suggestion that this increase in water temperature supports a strengthening of groundfish populations and a decline in shellfish populations (e.g., snow crab and northern shrimp) which tend to prefer lower water temperatures.

**Section 4.3.3.2 Study Area 2005 to 2010 Catch Analysis, subsection Harvest Timing, page 56** - It is worth noting that consideration should be given to the fact that weather and ice conditions impact the timing of harvesting activity.

*MKI Response:* Revise the statement “the timing of the harvests can vary from year to year with resource availability, fisheries management plans, and enterprise harvesting strategies.” to “the timing of the harvests can vary from year to year with resource availability, fisheries management plans, enterprise harvesting strategies, weather conditions, and ice conditions.”

**Section 4.3.3.2 Study Area 2005 to 2010 Catch Analysis, subsection Northern Shrimp, page 56** (and all subsequent fisheries discussions) - There is no specific rationale given for only using May-November data. Northern Shrimp is harvested in the area 12 months of the year, be it by inshore vessels or offshore factory freezer trawlers.

**MKI Response:** Northern shrimp is harvested in the area year-round. However, only May-November data were used in correspondence with the temporal boundaries of the seismic program (see the last paragraph of Section 2.1: “The temporal boundaries of the proposed Project encompass the 1 May to 30 November period, 2014 to 2018.”)

**Table 4.5, page 89** - There is no qualifier for what measurement is used for the “Mean Catch Depth Range”.

**MKI Response:** Edit the column heading “Mean Catch Depth Range” to “Mean Catch Depth Range (m)” in Table 4.5, p.89 of the EA. Mean depth values, in metres, are given for catch data within the DFO Research Vessel Survey Database, which was the data source used to generate Table 4.5. Catch weights and species caught were tabulated in accordance with the depth ranges listed in Table 4.5.

**Section 4.3.8 Industry and DFO Science Surveys, page 90** - By the wording of the last paragraph it appears that the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab is a relatively new undertaking – “...past few years, such ...”. The truth is that this is a long standing survey that has been conducted for more than 10 years.

**MKI Response:** Change following text in last paragraph on page 90 “Members of the FFAW have been involved in an industry survey for crab in various offshore harvesting locations over the past few years,...” to “Members of the FFAW have been involved in an industry survey for crab in various offshore harvesting locations for over 10 years,...”

**Section 6 Cumulative Effects, page 216** - Although the last paragraph on the page may hold true historically, in recent years there has been an increase in the Seismic Programs operating in Newfoundland & Labrador waters in a given year.

**MKI Response:** It is unclear what types of geophysical programs the reviewer is including in Seismic Programs. The text as written on page 216 (last paragraph) is accurate in that it refers specifically to 2D or 3D seismic programs. The C-NLOPB maintains a geophysical activity summary, currently ranging from 1996 to 2013 ([http://www.cnlopb.nl.ca/exp\\_stat.shtml](http://www.cnlopb.nl.ca/exp_stat.shtml)), which indicates that from 2009 to 2013 there were zero to four 2D or 3D seismic surveys in a given year. If the reviewer is including wellsite and geohazard surveys (which periodically use small airgun arrays—typically four airguns for geohazard surveys for short duration programs) in addition to 2D and 3D seismic surveys in Seismic Programs, then in recent years, the number of programs which are employing airgun arrays in Newfoundland and Labrador waters have been variable, with two to seven wellsite surveys and zero to two geohazard surveys in a given year from 2009 to 2013.

**Appendix 1 Consultation Report, page A1-9** - In the context of stakeholder groups FFAW|Unifor and One Ocean, John Christian is not a contact for either of these organizations, rather he was in as a consultant for the proponent.

**MKI Response:** Remove John Christian from the Contact column for the stakeholder groups FFAW|Unifor and One Ocean in Appendix 1, p.A1-9 of the EA.

## Literature Cited

- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2014. COSEWIC wildlife species search. Available at [http://www.cosepac.gc.ca/eng/sct5/index\\_e.cfm](http://www.cosepac.gc.ca/eng/sct5/index_e.cfm).
- CPAWS-NL (Canadian Parks and Wilderness Society, Newfoundland and Labrador Chapter). 2009. Special marine areas in Newfoundland and Labrador: Areas of interest in our marine backyards. Rep. by A. Rao, L.-A. Outhouse, and D. Gregory for CPAWS-NL. 173 p. + appendices.
- DFO (Fisheries and Oceans Canada). 2007. Placentia Bay-Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas. DFO Can. Sci. Advis. Sec. Res. Doc. 2007/052.
- DFO. 2010. Snow crab (*Chionoecetes opilio*) – Newfoundland and Labrador integrated fisheries management plan 2009-2011. Department of Fisheries and Oceans Canada, St. John's, NL.
- DFO. 2013. Identification of additional Ecologically and Biologically Significant Areas (EBSAs) within the Newfoundland and Labrador shelves bioregion. DFO Can. Sci. Advis. Sec. Sci. Rep. 2013/048.
- 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 p.
- Frank, K.T., R.I. Perry, and K.F. Drinkwater. 1990. Predicted response of northwest Atlantic invertebrate and fish stocks to CO<sub>2</sub>-induced climate change. *Trans. Amer. Fish. Soc.* 119: 353-365.
- 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 p.
- Rose, G.A. 2005. On distributional responses of north Atlantic fish to climate change. *ICES J. Mar. Sci.* 62(7): 1360-1374.
- SARA (Species At Risk Act). 2014. Species at Risk public registry. Available at [http://www.sararegistry.gc.ca/default\\_e.cfm](http://www.sararegistry.gc.ca/default_e.cfm).

## Personal Communication

- E. Dawe. 2014. DFO, St. John's, NL.
- F. Mercier. 2013. Parks Canada, Gatineau, QC.