ENVIRONMENTAL ASSESSMENT UPDATE: GXT'S LABRADORSPAN 2-D SEISMIC, GRAVITY AND MAGNETIC SURVEY, 2013-2015, FOR 2014

Prepared by

LGL LIMITED
environmental research associates

and

ion
GX TECHNOLOGY

Project No. FA0008

May 2014

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1.0 INTRODUCTION

1.1 Purpose

This document is submitted to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) as an update of GX Technology Canada Ltd.'s (GXT's) Environmental Assessment (EA) for its LabradorSPAN 2-D Seismic, Gravity and Magnetic Survey, 2013-2015 (LGL and GXT 2013). The conclusions of that assessment in 2013 were that potential effects from the Project, as proposed, were predicted to be not significant with the identified mitigations in place (see EA Sections 5, 6 and 7). Similarly, C-NLOPB stated in its Letter of Determination (dated 14 August 201[3]): "We have considered this information and the advice of the Boards' advisory agencies and have determined that the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects" (http://www.cnlopb.nl.ca/pdfs/gxtc/letterdet.pdf), as it did in its August 2013 Screening Report Decision concerning the Project: "The C-NLOPB is of the opinion that, taking into account the implementation of the proposed mitigation measures set out in the conditions above and those committed to by GX Technology Canada Ltd., the Project is not likely to cause significant adverse environmental effects" (http://www.cnlopb.nl.ca/pdfs/gxtc/screenreport.pdf).

This EA update report is required by the C-NLOPB to consider any new information that might have become available since the 2013 screening about the relevant physical or socio-economic environment, new scientific literature relative to the EA Valued Ecosystem Components (VECs), and to ensure that the work planned for 2014 remains within the scope of the screening of the Project. It has been guided by the final Scoping Document issued by the C-NLOPB on 26 March 2013, as well as by advice provided the C-NLOPB (in discussions, 2014), and discussions during GXT's 2014 update consultations.

1.2 Proponent and Proponent Contacts

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1.3 Scope of the EA Update

As described above, in 2013 the C-NLOPB determined that the LabradorSPAN seismic survey proposed by GXT was not likely to result in significant adverse environmental effects. This determination was based on the EA that was submitted by GXT (LGL and GXT 2013) and on the subsequent filings by GXT in response to comments, questions and advice during the public review process.

The scope of the 2013 EA covered all Project activities, including all geophysical surveys – seismic, gravity and magnetic, for the period 2013 - 2015. The EA was guided by the Scoping Document released by the C-NLOPB on 26 March 2013, which outlined the factors to be considered in the EA and this EA update, and by stakeholders who were contacted for input (see below). Another aspect of scoping for the effects assessment involved reviewing relevant and recent EAs that were conducted in Newfoundland and Labrador waters including (but not limited to) the MKI Labrador Environmental Impact Statement (EIS; RPS 2011), the Chevron Labrador seismic EA (LGL 2010), the Labrador Shelf infill-extension seismic EA (Canning and Pitt 2007), and the *Strategic Environmental Assessment Labrador Shelf Offshore Area* (Sikumiut 2008). Reviews of the present state of knowledge on the effects of seismic as well as the biological setting of the Study Area were also conducted.

As described below, the 2014 Project work will occur within the same Project Area and within the same temporal period using the same methodology, and other project parameters; thus, it has been assessed within the previously approved EA. This update therefore focuses on relevant changes that may have occurred since the filing of the EA in March 2013. This includes considerations such as:

- Any new Species of Special Concern that have been designated under the *Species at Risk Act*, by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or under the *Migratory Birds Convention Act* that may occur within the Project Area;
- Introduction of new species or critical habitat to Schedule 1 of *SARA*; implementation of recovery strategies and/or monitoring plans;
- Any recently designated Special Areas;
- Any new or experimental fisheries and fisheries research surveys;
- Any new literature on the effects of sound and/or seismic surveys on marine biota; and
- Any resultant changes in mitigation.

1.4 Organization of the Update Report

This EA update report provides (Section 2) a brief description of the three-year LabradorSPAN Project as presented in the 2013 EA, including equipment, methodology, and spatial and temporal boundaries; describes the work planned for 2014; and demonstrates how the 2014 work, methods and equipment remain within the scope of the original EA and the C-NLOPB Screening.

This is followed (Section 3) by a brief report on the 2013 LabradorSPAN program work, including the application of the mitigation plan and communication procedures and commitments, and conclusions about environmental effects during the program. Section 4 provides information about the 2014 consultations and communications with beneficiaries, stakeholders and other interested parties about the planned 2014 program.

Sections 5 through 7 review any new information that has become available since the 2013 screening about the status of VECs, cumulative effects, and other aspects of the physical and socio-economic environment, and any new scientific literature relevant to the EA VECs. This includes a consideration of the continuing validity of the environmental effects assessment conclusions for the 2014 Project work, with the identified mitigations in place.

Section 8 reviews the communication and other mitigation commitments from the 2013 EA and screening process, and reasserts GXT's commitments to these measures, and Section 9 presents a summary of the update conclusions. Section 10 contains a bibliography of the literature consulted and/or referenced.

2.0 PROJECT DESCRIPTION

The following sections summarize the key elements of GX Technology Canada Ltd.'s 2-D Seismic, Gravity and Magnetic Survey for the Labrador Shelf Area, 2013 to 2015, as described in the 2013 EA document and subsequent filings, and as considered in the C-NLOPB's Screening Report and Letter of Determination, particularly as they relate to the scope of the Project. This section also describes the work proposed for 2014, and demonstrates how that program remains within the scope assessed in 2013.

2.1 Project Overview and Methodology

As described in the 2013 EA and subsequent filings, GXT's 2-D Seismic, Gravity and Magnetic Survey for the Labrador Shelf Area, 2013 to 2015, is a 2-D (single streamer) marine geophysical survey to collect seismic, gravity, and magnetic data, potentially starting as early as 1 June and concluding as late as 30 November in any of those years. The survey is restricted to a defined Project Area (Figure 2.1), focused mainly on the Labrador Shelf and Slope, using a conventional seismic ship which tows a sound source (compressed air array) up to 6300 in^3 in volume, and a single streamer (buoyant cable) up to 12 km long, containing receiving (listening) hydrophones. The sound energy received by the hydrophones is recorded by computers on board the seismic ship. The seismic vessel also passively collects and records gravity and magnetic data at the same time, and has an echosounder for depth soundings. A support vessel is also used when necessary to scout for fishing gear or hazards, and potentially for re-supply or crew changes. All vessels operated during the Project are approved for operation in Canadian waters by Transport Canada and the C-NLOPB.

All of the following components and aspects of the 2013 EA Project Description apply fully to the proposed 2014 LabradorSPAN work, as do the communication, mitigation, safety and emergency response plans detailed in that EA and subsequent filings.

2.2 Spatial and Temporal Boundaries

In terms of spatial boundaries, the Project Area is located on the Labrador Shelf and Slope between approximately 61°N and 50.5°N, as depicted in Figure 2.1. Depths in the area range from approximately 100 m to 3,000 m. No acquisition or gear deployment will occur outside this Project Area. As shown on the maps in the 2013 EA and in this document, the Project Area is within Canada's Exclusive Economic Zone (EEZ) but does not enter the waters of Canada's Territorial Sea, or within the Nunatsiavut Zone (the Tidal Waters of the Labrador Inuit Settlement Area, as defined in the Labrador Inuit Land Claims Agreement). Acquisition lines will end approximately 6 km short of the Zone boundary to ensure that line turns can be made without seismic equipment (array or streamer) entering the Zone. The EA Study Area includes the Project Area plus a 20 km buffer area around the Project Area (Figure 2.1) to account for the propagation of seismic survey sound that could potentially affect marine biota.

Nearly all of the EA Study and Project Area are within the Study Area used for the C-NLOPB's *Strategic Environmental Assessment Labrador Shelf Offshore Area* (Sikumiut 2008). The western limit of the Project Area is about 22 km (at its closest) from the Labrador mainland. The communities closest to the Project Area are approximately 40–50 km away. No portion of the survey will be acquired within Gilbert Bay, Nain Bight or Hamilton Inlet; survey lines and activities will also remain outside of the Hawke Channel area (closed to mobile fishing gear).

As discussed in the EA, in addition to acquisition within the Newfoundland and Labrador sector, some of the lines in one or more years may extend into areas beyond the C-NLOPB's jurisdiction, (e.g. Greenland) and/or into

international waters, beyond the EEZ boundary. The timing of the acquisition of specific lines within the LabradorSPAN Project Area in any year will depend on several factors, including commercial fish harvesting, the local weather, sea state, ice conditions in specific locations, and on the timing of parts of GXT's program in other jurisdictions.

The LabradorSPAN project work proposed for 2014 has been planned to conform with, and will adhere to, each and all of these spatial and temporal boundaries.

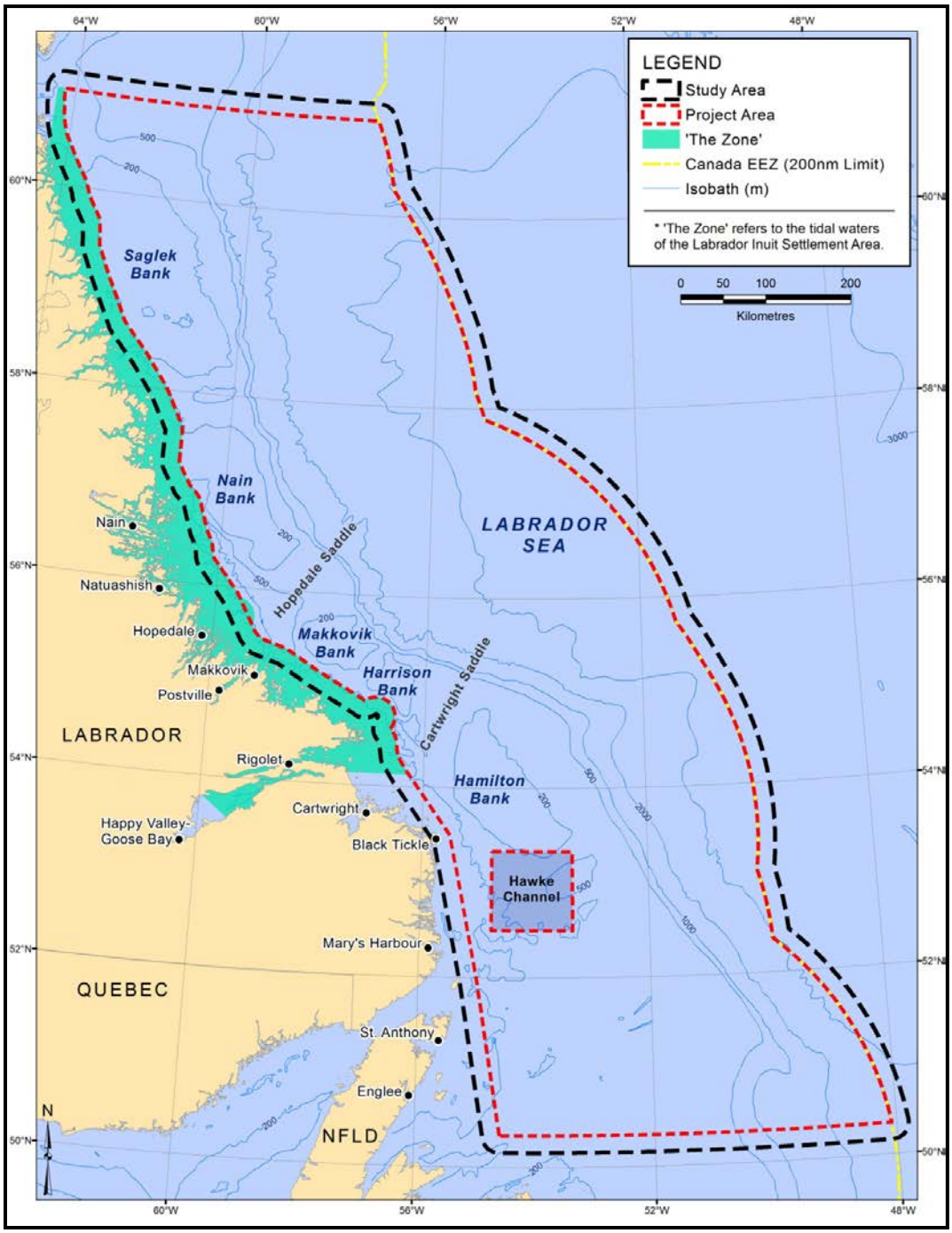


Figure 2.1 Locations of the Project Area and Study Area for GXT's LabradorSPAN seismic program(s), 2013 to 2015.

2.3 Survey Vessels

In Section 2.2.6 of the 2013 LabradorSPAN EA (LGL and GXT 2013), details were provided for ships that might be used for the Project, noting however that "If another vessel needs to be used instead as the seismic source ship, it will be equivalent in all respects related to environment and safety. This would not alter acquisition methods, mitigations or impact predictions." (Note, page 9)

Subsequently, the seismic ship M/V *Discoverer* was submitted to the C-NLOPB on 28 June 2013 and deemed by the regulator and the vessel's Classification Society to be appropriate for the work. This ship - which conducted the successful 2013 LabradorSPAN program - may possibly be used again (in 2014, as in 2013), though as before the use in its place of another suitably equivalent (and fully inspected) ship would not alter acquisition methods, mitigations or impact predictions contained in the 2013 EA, or go beyond the EA scope.

The support vessel, GXT's M/V *Polar Prince*, was the candidate vessel described in the 2013 EA, and was used during the 2013 survey where necessary. It is also the likely support ship for use during the 2014 program.

In any case, the proposed 2014 program will remain within the 2013 EA scope, using a conventional seismic ship, which will tow the sound source (airgun array) and a single streamer containing receiving hydrophones, as described above and below. The seismic vessel will also collect (passively) gravity and magnetic data at the same time, and it will have an echosounder for depth soundings. The seismic ship will likely deploy a workboat to repair the streamer when necessary, and the workboat is also used as a Fast Rescue Craft and for ship to ship personnel transfers. Ship re-supply, re-fuelling and transfers of personnel, communications with other vessels (primarily fishing vessels), and scouting for hazards will be done by the support vessel. Any seismic vessel operated during the Project will be approved for operation in Canadian waters by the relevant classification society and the C-NLOPB and all aspects of their design, capabilities, equipment and safety and response measures remain within the scope of the 2013 EA.

Both ships will be fully MARPOL compliant, and have oil spill/pollution prevention and emergency response plans. As described in the 2013 EA, the ships will use low-sulphur marine diesel fuel (~1,000,000 L within Canadian waters by both ships) each year. They will require normal ships' supplies/provisions. Re-supply, re-fuelling and transfers of personnel may be done offshore using the support ship and/or suitable area ports. No helicopter or additional support vessel use is planned. Only existing Newfoundland and Labrador port infrastructure are planned to be used for this Project.

As stated in the 2013 EA, it is also possible that the project might hire another smaller boat to assist with scouting operations (i.e., locating gear) in areas that might have active fisheries.

2.4 Seismic Energy Source and Streamer

The 2013 EA, and the subsequent C-NLOPB Screening, was conducted on the basis of the seismic ship using a compressed air array as the seismic data sound source. The array type assessed had a series of 36 individual airguns in four sub-arrays, with different individual volume capacities, but totaling, together, a maximum of up to 6300 in^3. The nominal firing pressure of the array was 2000 pounds per square inch (psi), and the shot (airgun activation) interval was once every 19 to 22 seconds, which is about half as many shots per kilometre as most 2-D surveys. The array tow depth was specified at 8–11 m, and the survey speed at ~4.5 knots (8.3 km/h).

The seismic ship also tows a single seismic hydrophone cable (streamer), which was described in detail in Section 2.2.7 of the EA (LGL and GXT 2013). The streamer is permitted to be up to 12 km long, deployed near

the ocean surface, at a depth of approximately 9 to 15 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 seismic array and streamer planned for use in 2014 will conform to each of these maximum parameters (or less/lower). [1]

2.5 Other Equipment

Gravity and magnetic data is also collected (passively) using a marine gravity metre system. The seismic vessel is also equipped with an echosounder for depth soundings. These are housed on the seismic ship.

2.6 Proposed 2014 Work

For its proposed 2014 LabradorSPAN work, GXT will use a seismic ship, a support ship, and seismic equipment (including the array and streamer) that fall within the original EA scope – possibly with the same ships and equipment used for the 2013 Labrador program, and using the same methodology and approach employed in 2013, as described above and in the EA. (As noted above and in the EA, if different ships are used in any year they will be equivalent in capabilities and in all aspects relevant to the environmental assessment scope.)

GXT expects the acquisition in Labrador to begin in early June, and will continue potentially into November, depending on the timing of work on other projects and other factors. The array to be used will be up to 6300 in^3 in volume, operating at 2000 psi, towed at a speed of ~4.5 knots (8.3 km/h) when in acquisition, at depths between 8 m and 11 m. The array will activate every 19 to 22 seconds. The single seismic hydrophone cable used will be up to 12 km long, deployed at a depth between 9 m and 15 m.

For 2014, GXT will request to permit approximately 5,300 km of seismic acquisition within the LabradorSPAN Project Area, though it is expected that less than this amount will actually be acquired. As with the 2013 work, the lines will be widely spaced (typically 50+ km apart, except where they intersect) and many of them are long (e.g. up to 500 km). No acquisition or gear deployment will occur outside the Project Area, including within the Nunatsiavut Zone or the Hawke Channel box.

As noted above, the timing of specific lines will depend on local factors at the time. In all cases, details of the planned acquisition, including maps, will be provided to fishing and other relevant interests during the survey so that they can supply feedback about the proposed plans, as was done during the 2013 survey.

All of the communications and other mitigation procedures will be used in 2014, as will all other environmental protection, emissions control, safety and emergency measures, as described in the EA Section 5.7, and as required in the C-NLOPB's Screening Report (see further in Section 8 below). No requirement for additional mitigation measures beyond those established in 2013 has been identified.

[1] It is possible that GXT might request to increase the authorized maximum volume to 6420 in^3 (a 1.9% increase in total array volume over the 6300 in^3 assessed in the 2013 EA; if so, a separate EA amendment would be filed with the C-NLOPB.)

2.7 2014 Work in Relation to the EA, the C-NLOPB Screening and Mitigation Commitments

As described above, all aspects of the proposed 2014 LabradorSPAN work plan fall within the scope of the 2013 EA submission (LGL and GXT 2013) , GXT's subsequent filings in response to questions and advice, and the screening by the C-NLOPB; and GXT will apply in 2014 each of the identified communication, mitigation, safety and emergency response plans, all of which contributed to the Board's determination that "the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects", and that the project might proceed.

3.0 REPORT ON 2013 LABRADORSPAN PROGRAM

3.1 LabradorSPAN 2013 Program Activities

The C-NLOPB screening of GXT's LabradorSPAN 2-D Seismic, Gravity and Magnetic Survey, 2013-2015 program was completed on 14 August 2013, and the Letter of Determination was issued the same day, allowing the Project to proceed to authorization. On 20 August 2013, the Board issued a Geophysical Program Authorization (GPA) for the 2013 work.

The *Discoverer* and the *Polar Prince* left the port of St. John's on 20 August 2013, and sailed north to the Project Area where gear deployment and equipment testing began. Seismic acquisition commenced on 24 August 2013 and continued with two port calls in St. Anthony, on 18 September and 24 October. Surveying was suspended on 1 November 2013, primarily as a result of deteriorating weather conditions. During the 70 day program, a total of 6574.65 km of seismic data were acquired, an overall average of 94 km per day. This averages about 9 hours per survey day in production, which means that approximately 38% of this time was spent in actual acquisition mode. Most of the downtime was the result of weather conditions, port calls, the presence of icebergs, and to a lesser extent routine maintenance.

The majority of the production was on lines that GXT had designated High Priority. In most cases, production on lower priority lines was the result of reduced opportunity on the Priority lines, mainly because of concurrent fixed-gear fisheries surveys that were avoided by the seismic ship, and to a lesser extent by weather conditions in some areas.

Fuel bunkering operations, re-supplying and crew changes were conducted during the two port calls in St. Anthony. The crew achieved the Health and Safety Targets that were established before the start of the program. From the perspective of ship operations, the flow of information from the shore side resulted in very little to no interference for both the seismic survey and commercial fishing activities. The greatest impact on acquisition plans was the result of working around fisheries science surveys - particularly the Industry-DFO Collaborative Post-Season survey for snow crab - which changed GXT's plans in certain locations and resulted in several hundred km of high priority lines not being acquired that year.

3.2 Environmental Conditions / Effects on the Project

The weather conditions (wind and waves) were the most significant environmental elements affecting the Program over all. On the whole, the conditions were good during the months of August and September. However, as expected, during the month of October the conditions worsened and the survey ended at the beginning of November. There was a total of 237 hours lost owing to adverse weather conditions during the survey. The cold Labrador Current which flows south along the coast of Labrador impacted the vessel speed and streamer control at times. There were four occasions during the project when the vessel had to move offline to avoid the large floating icebergs. At the northern end of the survey area it was noted that the sea surface temperature was around 2^{o}C, slightly lower than expected for that time of the year. This dropped slightly towards the end of the survey but on the whole this did not have any substantial effect on the survey. Overall, the project ships and personnel worked well with the conditions encountered and production was average to good.

3.3 Implementation of Communication and Mitigation Measures

Each of GXT's mitigation commitments and conditions - as described in the EA, subsequent filings related to the screening and in the GPA conditions - were implemented during the survey. In terms of the extensive communications protocols employed (particularly for fisheries and fisheries science), every indication is that these worked and were effective in 1. maintaining an adequate and steady flow of information about survey activities to the industry, DFO and other interests; and 2. maintaining a good flow of information to GXT managers and on-board personnel, including FLOs, so that the appropriate operational decisions could be made. As a result, there was no report - to GXT directly, to the FLOs, to the Fish, Food and Allied Workers union (FFAW), to Nunatsiavut representatives, to the Single Point of Contact (SPOC) or to the C-NLOPB - of interference with fishing activities, of fishers being asked to move gear, of gear being snagged by seismic equipment, or gear damage incident reports or claims.

For the science surveys, similarly, GXT maintained its commitments, and there were similarly no interference incidents reported. GXT's surveying and gear deployment activities remained inside the established Project Area at all times, and outside coastal waters, the Nunatsiavut Zone and the Hawke Channel. All of these activities at sea were also under the watchful eyes of the FLOs, representing fisheries interests throughout the Project Area. Reporting occurred on a timely basis, as required.

While it is not possible to make definitive statements about the full level of effectiveness of the wildlife mitigations implemented for the 2013 LabradorSPAN survey (e.g. did any whales beyond the observational distance of the marine mammal and seabird observers or MMSOs modify their behaviour?), the mitigation plan was effective in implementing each of the prescribed measures. All were put in place, supported by crew members and supervised by the on-board professional wildlife biologists. As the level of effort and the data collected during the survey - also provided to the Department of Fisheries and Oceans (DFO), Environment Canada and Torngat Wildlife, Plants and Fisheries Secretariat - indicate, a considerable amount of time was expended watching for and recording wildlife and their responses to GXT's activities. Again, nothing in their observations indicated obvious signs of stress on ecosystem components. Similarly the FLO reports did not indicate the presence of dead fish or other distressed animals.

There were no environmental accidents or emergencies, and materials were handled and disposed of properly.

Simultaneous operations protocols were established when another seismic survey was in the general area of GXT's work, and the two seismic ships did not come close to each other.

With respect to impacts of the environment on the project, the primary pathways affecting survey activities were as anticipated in the EA discussion (EA 5.7): weather (wind, waves, visibility) and avoiding fisheries interactions/ overlaps. Sea ice was not an issue, though watches were kept for icebergs, and several were seen in the general area of the ships from time to time.

Overall, based on the full implementation of the mitigations, communications with resource users and scientists during the survey, and the systematic reports and observations of the FLOs and MMSOs, there is nothing to indicate that the conclusions of GXT's EA and the C-NLOPB's Screening Report should not stand: that the project, as conducted, was not likely to have caused significant adverse environmental effects.

4.0 CONSULTATION AND COMMUNICATIONS

4.1 2013 Follow-Through

GXT's standing policy for consultation and information exchange for marine seismic projects is to communicate with interested rights-holders (e.g. beneficiaries), stakeholders and relevant agencies before the survey begins, to provide information about the project, and to gather information about resources, resource use, issues and concerns, and to agree on best approaches for continuing information exchange during the survey. As described in the EA (Section 5.3) and subsequent filings, GXT conducted extensive consultations and communications with relevant parties (e.g. fisheries representatives, government agencies, scientists, communities) in advance of the Board's environmental screening.

After the survey start, follow-through communications and information exchanges continued throughout the survey (see Section 3, above), and involved meetings, multiple e-mails from GXT (several a week on occasions) informing fisheries interests, DFO, Environment Canada, Department of National Defence, Government of Nunatsiavut representatives, the C-NLOPB and others, about planned and current activities, and providing maps of survey plans. In addition, a dedicated survey web site was established (gxtspan.com) and updated throughout the survey, and two newsletters were released and circulated broadly. On board the seismic ship, the two FLOs maintained at-sea radio communications with fishing vessels in the area, the crew and on-land project personnel and agencies.

Communications about the survey and survey contacts were also provided to Canadian Coast Guard radio (Notices to Shipping), to CBC radio Fisheries Broadcast and to the OKâlaKatiget Society (OK coastal radio network). All GXT communications contained contact details for GXT managers and for the 24-hour (live) toll-free telephone number to contact the SPOC, as well as the web site URL. Additionally, at each of the 2014 meetings (see below) a report has been presented on the 2013 survey program, including the preliminary results and outcomes of the MMSO program.

Indications during and after the 2013 survey were that these worked well, and each of these consultation, communication and information exchange measures will be implemented for the 2014 LabradorSPAN work, before and during the survey.

4.2 2014 Consultations

Consultation and information exchange activities in advance of the 2014 program have taken the form of meetings, telephone calls, e-mails, information packages, and brochures (in English and in Inuktitut, for Nunatsiavut communities) and the provision of wildlife observation data from the 2013 survey. The survey website has also been updated and contains information about the planned 2014 LabradorSPAN work (see gxtspan.com). As described above (as in 2013), these and other communications will continue before, during and after the 2014 Labrador work. Note that e-mail communications also included the provision of various information packages about the survey. (See examples in Appendix 1.)

To date, the communications outlined below have occurred about GXT's planned 2014 work.

4.2.1 Government / Government Agencies

- Government of Nunatsiavut
  Meeting, e-mails, telephone, brochures (English and Inuktitut)

  - Tom Sheldon, Director of Environment, Department of Lands and Natural Resources
  - Harry Borlase, Director of Non-Renewable Resources, Department of Lands and Natural Resources
  - Todd Broomfield, Fisheries Specialist, Department of Lands and Natural Resources
  - Rodd Laing, Environmental Assessment Manager, Department of Lands and Natural Resources
- Torngat Wildlife, Plants and Fisheries Secretariat (Nunatsiavut)
  Meeting, e-mails, data, brochures (English and Inuktitut)
  - Meghan Marriott, Biologist / GIS Specialist
  - Arron Dale, Policy Analyst
  - Julie Whalen, Torngat Fisheries Research Program Manager
- Department of Fisheries and Oceans Canada (DFO)
  Telephone, data and/or e-mail
  - Earl Dawe, Research Scientist, Shellfish Section
  - Paul Higdon, Research, Fisheries Sampling / Surveys
  - Jason Kelly, Senior Biologist, Marine Habitat Section
  - Jack Lawson, Research Scientist, Marine Mammals Section
  - Daryl Mullowney, Aquatic Science Biologist, Shellfish Section
  - Don Power, Section Head, Groundfish Section
  - George Sheppard, Technician, Program Services and Planning/ science surveys
  - Don Stansbury, Section Head, Shellfish Section
  - Blair Thorne, Oceans Biologist, Integrated Management
- Environment Canada / Canadian Wildlife Service
  Telephone, data, e-mail
  - Carina Gjerdrum, Seabird Issues Biologist
  - Stephanie Avery-Gomm, Special Projects
- Department of Fisheries and Aquaculture Newfoundland and Labrador
  E-mail
  - Todd Budgell, Manager of Aquaculture Licencing and Inspections
- Department of National Defence Canada
  E-mail
  - Carol Lee Giffin, Safety and Environmental Officer, Maritime Forces Atlantic / MARLANT

4.2.2 Commercial Fisheries

- The Fish, Food and Allied Workers union (FFAW)
  Meeting, e-mails, telephone
  - Jóhan Joensen, Petroleum Industry Liaison
  - Robyn Saunders, Petroleum Industry Liaison

- Torngat Fish Producers Co-operative Society, Limited
  Meeting, e-mails, brochures (English and Inuktitut)
  - Keith Watts, General Manager
  - Ronald Johnson, Assistant General Manager
- Association of Seafood Producers (ASP)
  Telephone, e-mail
  - Derek Butler, Executive Director
- Labrador Fisherman's Union Shrimp Company
  Telephone, e-mail
  - Gilbert Linstead, General Manager
  - Claude Rumbolt, LFUSC Representative
- Canadian Association of Prawn Producers (CAPP)
  E-mail
  - Bruce Chapman, Executive Director
- Ocean Choice International (OCI)
  Telephone, e-mail
  - Rick Ellis, Director, Manager of Fleet Operations
- Clearwater Seafoods
  Telephone, e-mail
  - Catherine Boyd, Manager Corporate Affairs
- Davis Strait Fisheries
  E-mail
  - John Andrews, President
- Groundfish Enterprise Allocation Council (GEAC)
  E-mail
  - Bruce Chapman, Executive Director
- Harbour Grace Shrimp Company
  E-mail
  - Bev Sheppard
- Icewater Seafood Inc
  E-mail
  - Dennis Slade, Fisheries Consultant
- MV Osprey Ltd
  E-mail
  - Scott Nichols, Fleet Manager

- Nataaqnaq Fisheries Inc.
  E-mail
    - Keith Coady, Fleet Manager

- Newfound Resources Ltd.
  E-mail
    - Brian McNamara, President

4.2.3 Other Agencies / Organizations

- One Ocean
  Telephone, e-mail
    - Maureen Murphy Rustad, Director
- Nature Newfoundland and Labrador
  Telephone, e-mail
    - Len Zedel, Memorial University
- NunatuKavut
  In-person contact, e-mail, brochures (English and Inuktitut)
    - George Russell, Natural Resources Manager

4.2.4 Communities / Community Groups

GXT, with assistance from Sikumiut Environmental Management, contacted each of the Nunatsiavut area and other community groups (e.g. Community Councils, Band Councils) offering in-person meetings with GXT about the proposed 2014 work. Some of the communities responded that they were satisfied with the information already presented (last year and to other Nunatsiavut representatives and groups this year) and did not require to meet again before the 2014 survey. Other's indicated that they did not wish a meeting at this point but might in the future, possibly during or after the survey. In all cases, GXT noted that it was prepared to visit at any time if a community decided that it would like to meet. In addition, GXT was invited (Nunatsiavut Lands and Natural Resources) to meet with fishers, fisheries science and other fisheries representatives at the annual conference that will be held in Nunatsiavut in November 2014; GXT accepted this invitation.

For each of the communities, project brochures (in English and Inuktitut) describing the work planned for 2014 were either left in, or mailed to, community offices. Print and e-mailed communications provided full contact information for GXT project managers and the dedicated website, and invited contact from any group or individual who wished to discuss any issue, provide information or request further information about GXT or the survey.

4.3 Information / Issue Identification

During the meetings and/or as a result of the other information exchanges and communications, no new issues were identified that had not be raised during the 2013 consultations leading up to the EA and the C-NLOPB screening (see EA Section 5.2.3 and subsequent GXT filings), each of which is intended to be addressed in the various communication and other mitigation measures identified in those documents, and which will be applied again in 2014. A number of commentators remarked that GXT had done a very good job with the continuing communication process in particular during the 2013 work

Key messages that GXT received reinforced the need to maintain these levels of communications in 2014 to mitigate potential impacts on commercial fisheries and fisheries science, including frequent updates about activities and the mutual exchange of plans, including the use of at-sea FLOs representing both Nunatsiavut and FFAW interests.

5.0 VALUED ENVIRONMENTAL COMPONENTS (VEC) – UPDATE

Many important components of the ecosystem such as fish and invertebrates, seabirds, sea turtles and marine mammals may be affected by the Project and were discussed in detail in Section 4.0 of the EA (LGL and GXT 2013). This section provides an update of the VECs assessed under the EA for GXT's program (LGL and GXT 2013) and considered in the C-NLOPB's screening.

5.1 Species of Special Status

Section 4.6 of the EA provided information on Species at Risk (LGL and GXT 2013). Table 5.1 below summarizes species at risk that could occur within the Project, based on information current as of May 2014 from the websites for *SARA* (http://www.sararegistry.gc.ca/default_e.cfm) and COSEWIC (http://www.cosepac.gc.ca/index.htm). Updates to species designations since the EA was prepared in 2013 are noted in blue in Table 5.1 and are detailed below:

- Addition of thorny skate; it was assessed as special concern by COSEWIC
- Addition of Kemp's Ridley sea turtle; although unlikely to occur in the Project Area, it is considered a low-priority candidate species by COSEWIC
- Addition of king eider; it is considered a low-priority candidate species by COSEWIC and may migrate through the Project Area during October/November
- Addition of sei whale; it is considered a high-priority candidate species by COSEWIC.
- Hooded seals and harp seals have been changed from mid-priority candidate species to high-priority candidate species by COSEWIC
- Sperm whales have been changed from a low-priority candidate species to high-priority candidate species by COSEWIC

As of May 2014, no additional species of special status which may occur within the Project Areas have been added to Schedule 1 of *SARA*. However, the recovery strategy for the endangered Ivory Gull has been finalized since the submission of the EA (Environment Canada 2014). Critical habitat locations were identified in northern Nunavut but none were identified in Newfoundland and Labrador.

GXT 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. The company will comply with relevant regulations pertaining to *SARA* Recovery Strategies and Action Plans. GXT will continue to exercise due caution to minimize impacts on these species during all of its operations. GXT also understands that other marine species might be designated as *endangered* or *threatened* on Schedule 1 during the course of the Project and will continue to monitor any status changes. The list of bird families listed under the *Migratory Birds Convention Act* remains unchanged from the table provided in the original EA (LGL and GXT 2013).

Table 5.1 *SARA* Schedule 1 and COSEWIC-listed marine species that potentially occur in the Project Area.

Species		*SARA* Schedule 1			COSEWIC			
Common Name	**Scientific Name**	***Endangered***	***Threatened***	***Special Concern***	***Endangered***	***Threatened***	***Special Concern***	***Candidate Species***
Blue whale	*Balaenoptera musculus*	X			X			
Northern bottlenose whale (Scotian Shelf population)	*Hyperoodon ampullatus*	X			X			
Leatherback sea turtle	*Dermochelys coriacea*	X			X			
Ivory gull	*Pagophila eburnea*	X			X			
White shark	*Carcharodon carcharias*	X			X			
Northern wolffish	*Anarhichas denticulatus*		X			X		
Spotted wolffish	*Anarhichas minor*		X			X		
Atlantic wolffish	*Anarhichas lupus*			X			X	
Fin whale (Atlantic population)	*Balaenoptera physalus*			X			X	
Sowerby's beaked whale	*Mesoplodon bidens*			X			X	
Polar bear	*Ursus maritimus*			X			X	
Harlequin Duck	*Histrionicus histrionicus*			X			X	
Barrow's Goldeneye	*Bucephala islandica*			X			X	
Beluga (Eastern Hudson Bay population)	*Delphinapterus leucas*				X			
Beluga (Ungava Bay population)	*Delphinapterus leucas*				X			
Loggerhead sea turtle	*Caretta caretta*				X			
Atlantic cod (NL[a] population)	*Gadus morhua*				X			
Porbeagle shark	*Lamna nasus*				X			
Roundnose grenadier	*Coryphaenoides rupestris*				X			
Cusk	*Brosme brosme*				X			
Atlantic salmon (various populations)	*Salmo salar*				X	X	X	
American plaice (NL[a] population)	*Hippoglossoides platessoides*					X		
American eel	*Anguilla rostrata*					X		
Acadian redfish	*Sebastes fasciatus*					X		
Deepwater redfish (Northern population)	*Sebastes mentella*					X		
Northern bottlenose whale (Davis Strait-Baffin Bay-Labrador Sea population)	*Mesoplodon bidens*						X	
Harbour porpoise	*Phocoena phocoena*						X	
Killer whale (NW Atlantic/E Arctic populations)	*Orcinus orca*						X	

Species		*SARA* Schedule 1			COSEWIC			
Common Name	**Scientific Name**	***Endangered***	***Threatened***	***Special Concern***	***Endangered***	***Threatened***	***Special Concern***	***Candidate Species***
Blue shark	*Prionace glauca*						X	
Thorny skate	*Amblyraja radiata*						X	
Roughhead grenadier	*Macrourus berglax*						X	
Spiny dogfish	*Squalus acanthias*						X	
Sei whale	*Balaenoptera borealis*							High priority
Ringed seal	*Phoca hispida*							High priority
Hooded seal	*Cystophora cristata*							High priority
Harp seal	*Phoca groenlandica*							High priority
Northwest Atlantic lumpfish	*Cyclopterus lumpus*							High priority
Sperm whale	*Physeter macrocephalus*							Mid priority
Bearded seal	*Erignathus barbatus*							Mid priority
Spinytail skate	*Bathyraja spinicauda*							Mid priority
Pollock	*Pollachius virens*							Mid priority
Greenland shark	*Somniosus microcephalus*							Mid priority
Kemp's Ridley turtle	*Lepidochelys kempii*							Low priority
King Eider	*Somateria spectabilis*							Low priority

Sources: *SARA* website (http://www.sararegistry.gc.ca/default_e.cfm) (as of May 2014); COSEWIC website (http://www.cosepac.gc.ca/index.htm) (as of May 2014).
[a] Newfoundland and Labrador.

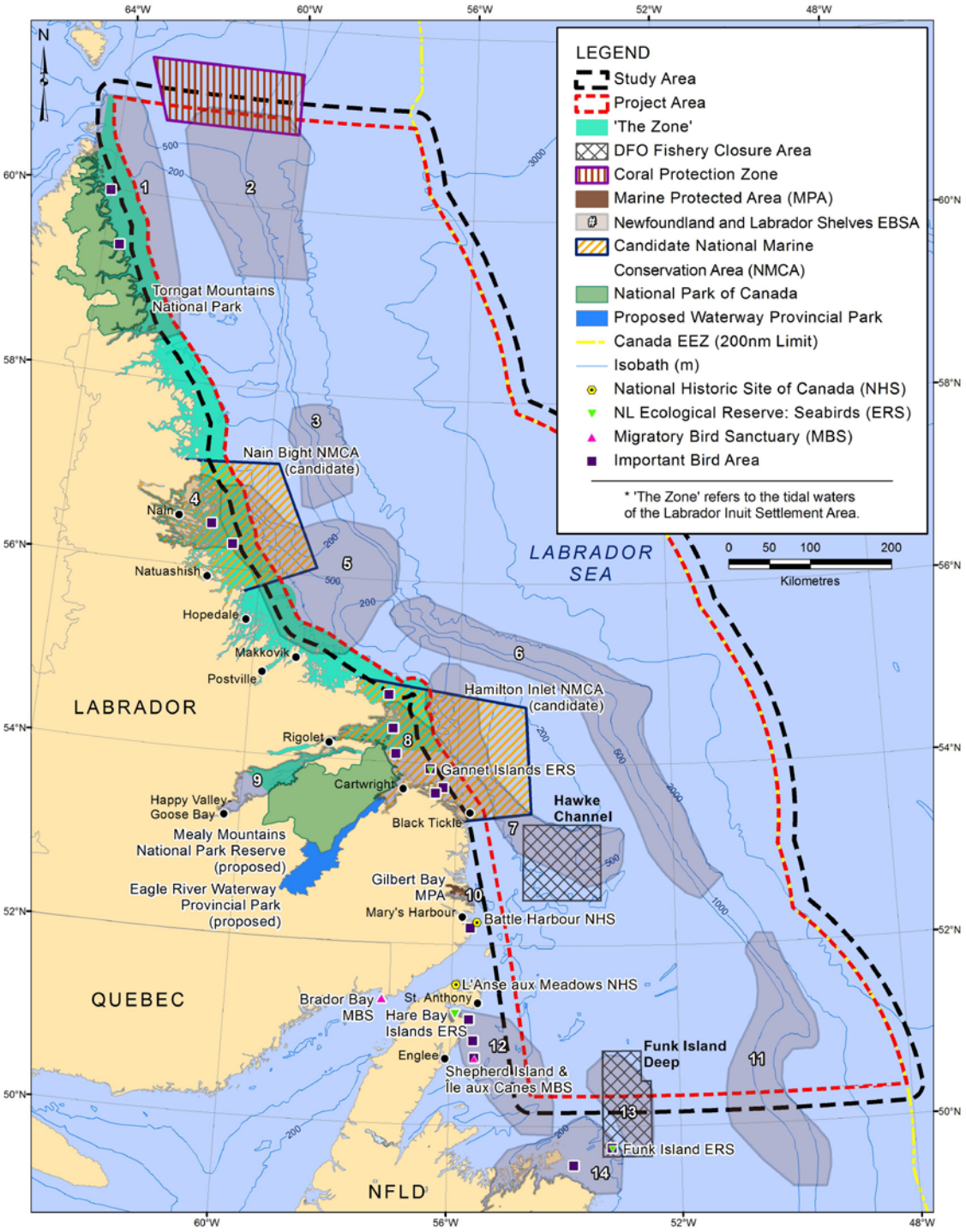
5.2 Special Areas

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 entirely or partially within the Study Area (see Figure 5.1), 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 5.2). Figure 5.1 provides the location and extent of special areas assessed under the original EA and screening process. No additional special marine areas have been designated in the Project Area since the completion of assessment in 2013.

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.



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

Figure 5.1 Ecologically and Biologically Significant Areas (EBSAs) and Sensitive Areas overlapping or proximate to the Project and/or Study Areas.

Table 5.2 Dominant features of ecological importance for the identification of Ecologically and Biologically Significant Areas (EBSAs) overlapping the Study Area (DFO 2013).

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

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.	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. Important area for seabird colonies, including Common Eider and Thick-billed Murre. Hosts one of the largest congregations of Glaucous Gull in the region. 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.
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.	Overwintering area for eastern Hudson Bay beluga population (*endangered*: COSEWIC). Aggregations of various seabird species, including Ivory Gull (*endangered*: *SARA* [Schedule 1] and COSEWIC). High densities of several fish species, including skates (e.g., thorny skate, *special concern*: COSEWIC), Atlantic (*special concern*: *SARA* [Schedule 1] and COSEWIC) and spotted wolffish (*threatened*: *SARA* [Schedule 1] and COSEWIC), roundnose grenadier (*endangered*: COSEWIC), redfish (e.g., deepwater redfish, *threatened*: COSEWIC), and shrimp and Greenland halibut (commercial species). High concentrations of sea pens (particularly ~400 m isobath), soft corals and small gorgonians (deeper waters, offshore edge).
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.	Important area for hooded seal (juveniles and females). Important feeding area for numerous seabird species. High densities of numerous fish and invertebrate species, including Atlantic (*special concern*: *SARA* [Schedule 1] and COSEWIC), spotted and northern wolffish (*threatened*: *SARA* [Schedule 1] and COSEWIC), roundnose grenadier (*endangered*: COSEWIC), skates (e.g., thorny skate, *special concern*: COSEWIC), redfish (e.g., deepwater redfish, *threatened*: COSEWIC), Atlantic cod (*endangered*: COSEWIC), American plaice (*threatened*: COSEWIC), and shrimp and Greenland halibut (commercial species). High concentrations of corals (north: soft and black corals; south: soft corals) and sponges (near Hamilton Spur).

EBSA	Location	Ecological Importance
Labrador Marginal Trough	Extends from Cartwright Saddle south through Labrador Marginal Trough, and into Hawke Saddle (just inside Hamilton Bank).	Important whelping and feeding area for harp seal (middle, trough area). Aggregations of feeding cetaceans (fall). Important area for several seabird species, including Ivory Gull (*endangered*: *SARA* [Schedule 1] and COSEWIC). Important area for American plaice (*threatened*: COSEWIC) and commercial invertebrate and fish species, including shrimp, snow crab, Greenland halibut, witch flounder and capelin.
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.	Important whelping area (pack ice) for harp seal, and fall/winter feeding area for ringed seal (western portion). Aggregations of several bird species, particularly Atlantic Puffin and Razorbill. Important area for Harlequin Duck (*special concern*: *SARA* [Schedule 1] and COSEWIC). Important spawning/habitat areas for capelin and Atlantic salmon. 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).
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.	High concentrations of diverse waterfowl and seabirds, including Harlequin Duck (*special concern*: *SARA* [Schedule 1] and COSEWIC) and Common Eider. Important breeding area for Great Black-Backed Gull, Herring Gull and terns. Aggregations of various groundfish, pelagic fish and shellfish. High concentrations of soft corals and small gorgonians (inner self area).
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.	Important feeding and migration area for cetaceans, including harp seal (winter). Important area for several seabird species. High densities of skates (including smooth and thorny skates, *endangered* and *special concern* [respectively]: COSEWIC), American plaice (*threatened*: COSEWIC), and commercial invertebrate and fish species, including shrimp, snow crab, Greenland halibut and capelin. Witch Flounder and redfish (e.g., deepwater redfish, *threatened*: COSEWIC) have been noted to occur in the area.

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.	Important area for several marine mammal species. Important area for numerous seabird species. Important area for several shark species. American Plaice (*threatened*: COSEWIC), Atlantic cod (*endangered*: COSEWIC), redfish (e.g., deepwater redfish, *threatened*: COSEWIC), Atlantic (striped; *special concern*: *SARA* [Schedule 1] and COSEWIC), spotted and northern wolffish (*threatened*: *SARA* [Schedule 1] and COSEWIC), skates (e.g., thorny skate, *special concern*: COSEWIC), roundnose grenadier (*endangered*: COSEWIC), and witch flounder have been noted to occur in the area. Coral bycatch recorded up to 1,300 m depth.

Sources: DFO 2013; *SARA* website (http://www.sararegistry.gc.ca/default_e.cfm) (as of 5 May 2014); COSEWIC website (http://www.cosepac.gc.ca/eng/sct5/index_e.cfm) (as of 5 May 2014).

5.3 Commercial Fisheries

Section 4.3 of the EA (LGL and GXT 2013) provided overviews of the commercial fishery and DFO scientific research. Commercial fishery data used in the EA were collected during the 2005 to 2010 period and provided in a detailed georeferenced format that facilitated an understanding of the likely location of gear concentrations and timing of fisheries in order to eliminate or minimize potential mutual interference with seismic operations. Since 2010, the format of commercial fishery data provided by DFO has changed; catch locations in these data are now less precise because data are provided at a resolution of 6 × 6 minute geographic cells. Figures 5.2 and 5.3 show the harvesting pattern for commercial fish and invertebrates in 2011 and 2012 (combined) by mobile gear (primarily shrimp and some groundfish using mobile trawls) and fixed gear (primarily snow crab with pots and groundfish using gillnets). (These are the most recent years for which these data are available at the time of writing.) Overall, the general harvesting pattern in catch locations has not changed from 2005-2010 to 2011-2012. Both fixed and mobile gears are typically used in the commercial fisheries conducted within the LabradorSPAN Project Area. During 2005-2010, shrimp trawls (mobile gear) accounted for most of the harvesting in this area (~96% of total catch weight), and fixed gears (pots and gillnets) accounted for ~4% of the total catch weight (see Table 4.6 in LGL and GXT 2013).

As in 2005-2010, (see Table 4.5 in LGL and GXT 2013), the principal fisheries within the Study Area in 2011 and 2012 were northern shrimp (*Pandalus borealis*), snow crab (*Chionoecetes opilio*), and Greenland halibut or turbot (*Reinhardtius hippoglossoides*) (Tables 5.3 and 5.4). Striped shrimp (*Pandalus montagui*) ranked fourth in terms of catch weight. The lists of species harvested in the Study Area in 2011 and 2012 were very similar to the species list from 2005-2010. The four species listed above were also the primary commercial species harvested in terms of catch weights in 2005-2010. Capelin (*Mallotus villosus*), white hake (*Urophycis tenuis*), haddock (*Melanogrammus aeglefinus*), Icelandic scallops (*Chlamys islandica*), flounder sp., yellowtail flounder (*Limanda ferruginea*), and monkfish (*Lophius americanus*) were also harvested in observable quantities during 2005-2010 (Table 4.6 in LGL and GXT 2013) but are not included in the 2011 and 2012 catches for the area.

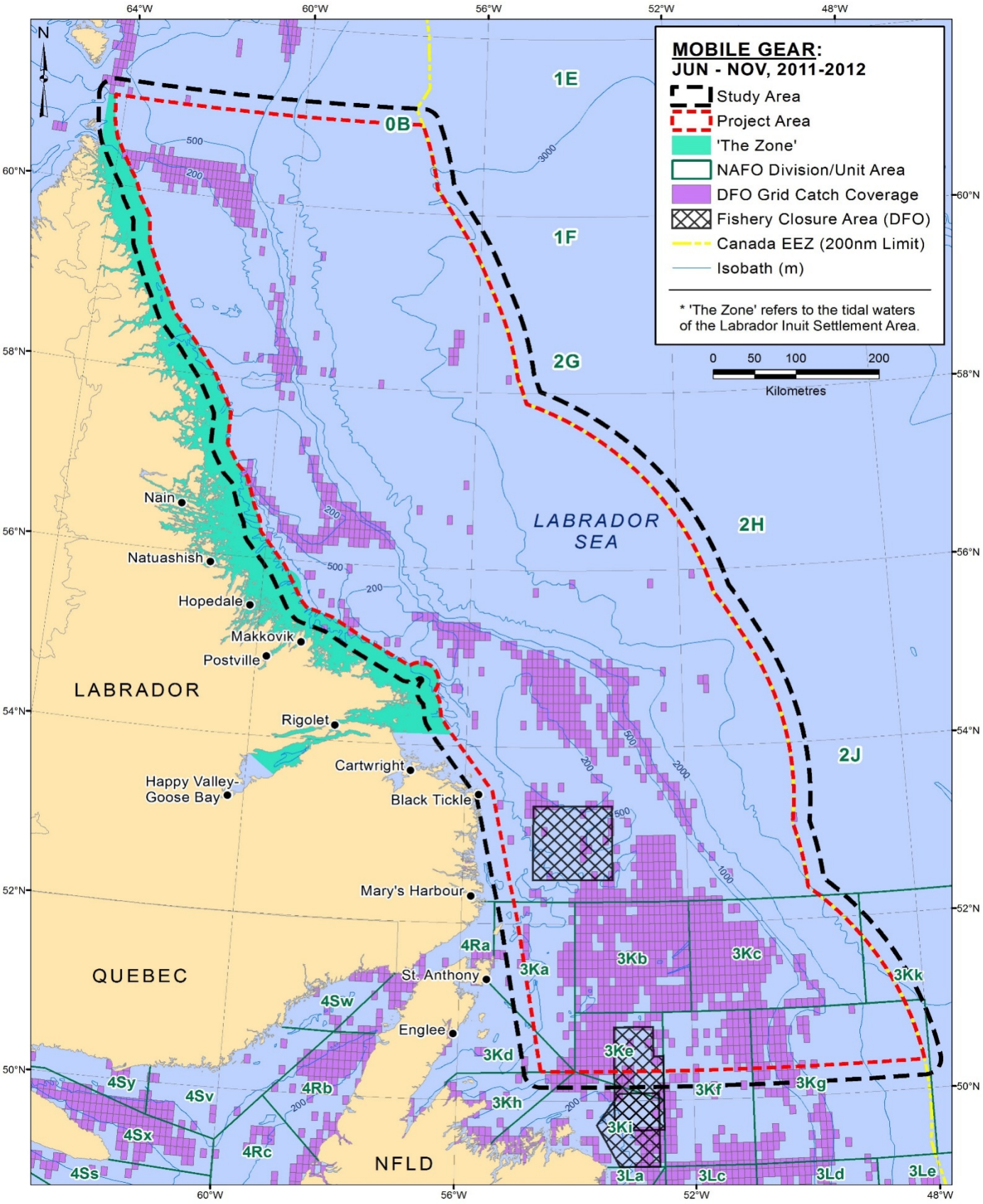


Figure 5.2 Mobile gear harvesting locations in June to November, 2011-2012.

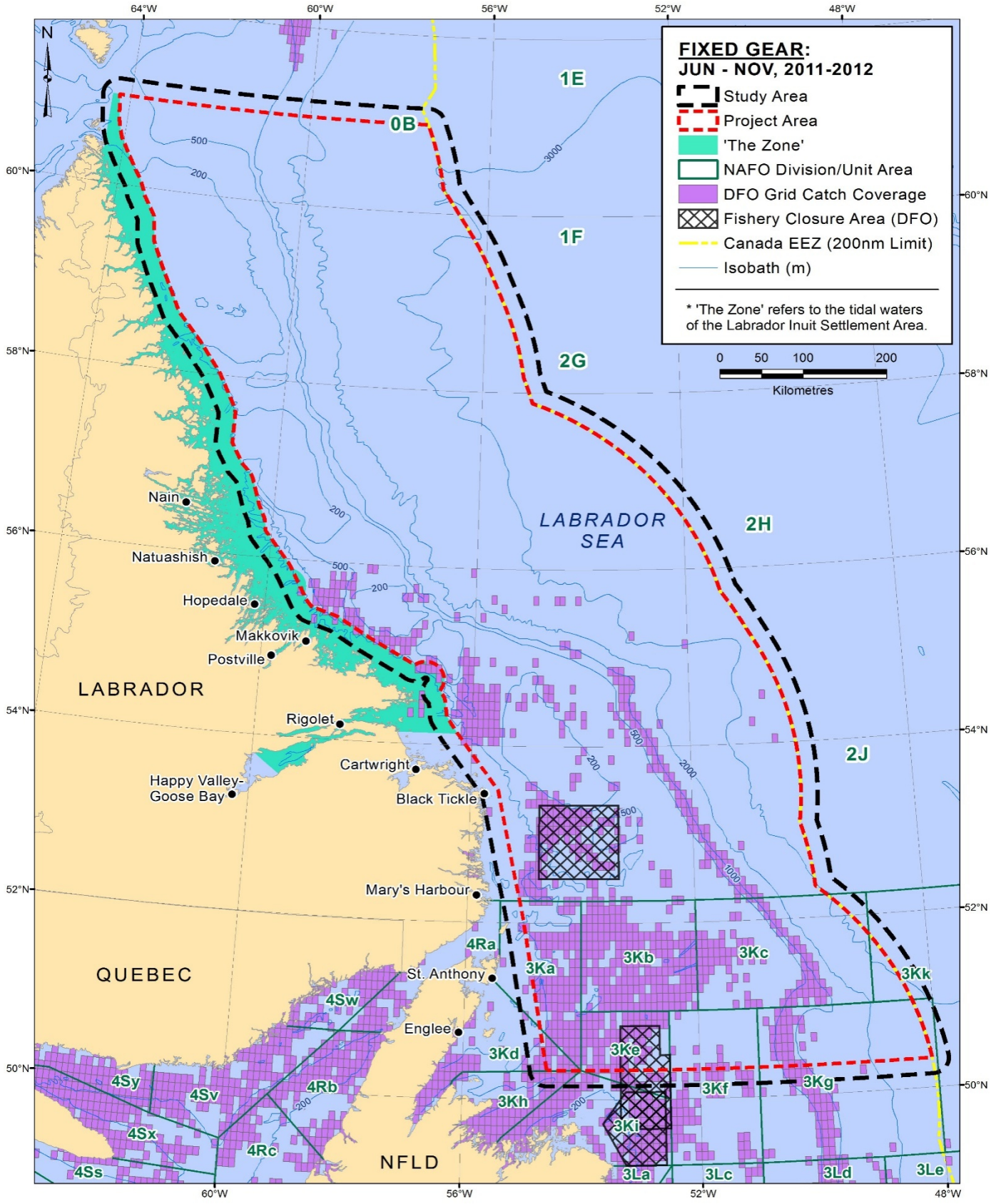


Figure 5.3 Fixed gear harvesting locations in June to November, 2011-2012.

Table 5.3 Commercial catch weights in the Study Area, June to November, 2011 and 2012. Values indicate the frequency of catch weight quartile ranges (i.e., 1-4) attributed to each species.

Species	Catch Weight Quartile Range Counts [a]							
	2011				2012			
	1	2	3	4	1	2	3	4
Northern Shrimp (*Pandalus borealis*)	396	796	1242	1296	374	784	951	1244
Snow Crab (*Chionoecetes opilio*)	418	345	97	14	380	397	156	41
Greenland Halibut (*Reinhardtius hippoglossoides*)	92	226	135	8	73	141	109	16
Striped Shrimp (*Pandalus montagui*)	5	18	30	51	10	24	48	69
Redfish sp. (*Sebastes*)	7	33	41	6	8	22	41	5
Roughhead Grenadier (*Coryphaenoides rupestris*)	18	38	24	3	11	16	21	2
Witch Flounder (*Glyptocephalus cynoglossus*)	2	19	23	4	2	6	21	1
American Plaice (*Hippoglossoides platessoides*)	0	1	2	3	2	3	2	1
Atlantic Halibut (*Hippoglossus hippoglossus*)	4	4	2	1	0	2	2	0
Skate sp.	0	4	8	0	0	2	4	0
Mackerel (*Scomber scombrus*)	0	0	0	0	0	1	0	0
Atlantic Cod (*Gadus morhua*)	1	0	0	0	1	0	0	0

Source: DFO commercial landings database, All Atlantic Regions (2011 and 2012)
[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined).
2011 quartile ranges: 1 = 0 – 2,377 kg, 2 = 2,378 – 11,045 kg, 3 = 11,046 – 45,183 kg, 4 = ≥ 45,184 kg
2012 quartile ranges: 1 = 0 – 2,618 kg, 2 = 2,619 – 12,233 kg, 3 = 12,234 – 47,739 kg, 4 = ≥ 47,740 kg

Table 5.4 Commercial catch values in the Study Area, June to November, 2011 and 2012. Values indicate the frequency of catch value quartile ranges (i.e., 1-4) attributed to each species.

Species	Catch Value Quartile Range Counts [a]							
	2011				2012			
	1	2	3	4	1	2	3	4
Northern Shrimp (*Pandalus borealis*)	587	941	1215	987	596	803	959	995
Snow Crab (*Chionoecetes opilio*)	295	406	161	12	306	413	224	31
Greenland Halibut (*Reinhardtius hippoglossoides*)	60	218	154	29	48	139	122	30
Striped Shrimp (*Pandalus montagui*)	6	20	29	49	9	23	47	72
Redfish sp. (*Sebastes*)	8	28	36	15	5	14	41	16
Roughhead Grenadier (*Coryphaenoides rupestris*)	13	35	29	6	5	18	20	7
Witch Flounder (*Glyptocephalus cynoglossus*)	3	16	19	10	1	5	21	3
American Plaice (*Hippoglossoides platessoides*)	0	0	2	4	1	3	3	1
Atlantic Halibut (*Hippoglossus hippoglossus*)	3	4	3	1	0	1	2	1
Skate sp.	0	4	5	3	0	2	3	1
Mackerel (*Scomber scombrus*)	0	0	0	0	0	0	0	0
Atlantic Cod (*Gadus morhua*)	1	0	0	0	1	0	0	0

Source: DFO commercial landings database, All Atlantic Regions (2011 and 2012)
[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined).
2011 quartile ranges: 1 = $0 – $7,281, 2 = $7,282 – $32,789, 3 = $32,790 – $126,294, 4 = ≥ $126,295
2012 quartile ranges: 1 = $0 – $8,240, 2 = $8,241 – $35,022, 3 = $35,023 – $130,732, 4 = ≥ $130,733

The fishery for northern shrimp off the coast of Labrador began in the mid-1970s, primarily in the Hopedale and Cartwright Channels, before expanding north and south in the 1980s (DFO 2013a). Northern shrimp has been the major fishery in the Project and Study areas over the last two decades; this remains the case based on data from 2011 and 2012 (Tables 5.3 and 5.4). In 2011 and 2012, northern shrimp were fished with bottom trawl during the June to November survey window within the Study Area (Table 5.5). Striped shrimp is typically caught as by-catch in the northern shrimp fishery even though there is also a directed fishery for striped shrimp (DFO 2013b).

Snow crab was the other principal commercial species harvested in the Study Area during 2011 and 2012 (Tables 5.3 and 5.4) with the fishery occurring in the spring and summer in both 2011 and 2012.

Greenland halibut made up the largest part of groundfish catches in the Study Area in 2011 and 2012. In 2011 and 2012, Greenland halibut were harvested during the June to November period within the Study Area (Table 5.5).

Table 5.5 Summary of gear type and months the commercial fishery was undertaken in the Study Area, June to November, 2011 and 2012.

Species	Month Caught		Gear Type	
	2011	2012	Fixed	Mobile
Northern Shrimp (*Pandalus borealis*)	Jun-Nov	Jun-Nov	-	Trawl
Snow Crab (*Chionoecetes opilio*)	Jun-Aug	Jun-Jul	Pot	-
Greenland Halibut (*Reinhardtius hippoglossoides*)	Jun-Nov	Jun-Nov	Gillnet	Trawl
Striped Shrimp (*Pandalus montagui*)	Sep-Nov	Jul-Nov	-	Trawl
Redfish sp. (*Sebastes*)	Jun-Aug	Jun-Aug; Nov	Gillnet	Trawl
Roughhead Grenadier (*Coryphaenoides rupestris*)	Jun-Nov	Jun-Sep	Gillnet	Trawl
Witch Flounder (*Glyptocephalus cynoglossus*)	Jun-Aug	Jun	Gillnet	Trawl
American Plaice (*Hippoglossoides platessoides*)	Jun	Jun	-	Trawl
Atlantic Halibut (*Hippoglossus hippoglossus*)	Jun-Aug	Jun	Gillnet	-
Skate sp.	Jun-Jul	Jun	Gillnet	-
Mackerel (*Scomber scombrus*)	-	Sep	-	Seine
Atlantic Cod (*Gadus morhua*)	Jul	Sep	Gillnet	-

Source: DFO commercial landings database, All Atlantic Regions (2011 and 2012)

5.4 Fisheries Research

The information provided for fisheries science research surveys in the original 2013 EA - i.e., the industry-DFO collaborative post-season snow crab trap survey (operated through the Torngat Secretariat and the FFAW) and DFO multispecies trawl surveys - also remain valid for this update document. As in 2013 (and as discussed in the EA), there may be overlap between the Study Area and these surveys in NAFO Divisions 2HJ3K, depending on the timing of the seismic survey and the science surveys in 2014. No new fisheries science research surveys in this area have been identified.

As occurred during 2013, GXT has communicated with the Torngat Secretariat, the FFAW and DFO about the expected timing and locations of these surveys in 2014 and GXT's work areas, and the exact dates will be communicated to GXT when they are finalized for 2014 GXT also has received the locations of the 2014 snow crab survey stations (the same as in 2013) and DFO confirmed that it will supply the multi-species trawl survey locations when they are generated, typically a few weeks before the survey is planned. The relevant mitigations described in the 2013 EA will be applied.

5.5 Seabirds and Migratory Birds

As noted in Section 4.4 of LGL and GXT (2013), there are five main concentrations of nesting auks, along the Labrador coast and the north coast of Newfoundland: (1) offshore islands southeast 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 in LGL and GXT 2013). These five island groups support over 640,000 pairs of breeding seabirds (see Table 5.6 below updated with CWS unpublished data acquired on 2 May 2014). 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 almost 87,000 pairs of nesting seabirds in the summer (Table 5.6). The Wadham Islands and Funk Island, not far south of the Study Area, host over 490,000 pairs of seabirds that travel great distances on foraging sorties. Colonies of terns (Arctic and Common) and gulls (Herring, Great Black-backed, Ring-billed and Glaucous) and nesting Common Eider are scattered along most of the Labrador coast and the north coast of Newfoundland.

Table 5.6 Breeding pairs of pelagic seabirds at Important Bird Areas (update to Table 4.9 in LGL and GXT 2013).

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		6,000[a]		10,030+
Northern Gannet								6,075	6,075
Herring Gull	-	-	present		-			150[a]	500+
Glaucous Gull	350	-	-	-	-				350
Great Black-backed Gull	-	-	100	120	20			75[a]	340
Black-legged Kittiwake	-	4[a]	-	72[a]	-	2,400		100[a]	3,323
Common Murre	2,260	-[a]	2,060[a]	31,170[a]	3,100			470,000[a]	440,122
Thick-billed Murre	8,000	126[a]	365[a]	1,846[a]	present			250	10,767+
Razorbill	815	-[a]	3,714[a]	14,801[a]	1,530		30	200	10,638
Black Guillemot	341	-	present	110	-		25		476+
Atlantic Puffin	12,240	-[a]	17,404[a]	38,666[a]	8,070		7,140[a]	2,000	176,855
Totals	**24,006**	**130**	**23,653+**	**86,821**	**12,720+**	**2,400**	**13,195**	**478,863**	**~642,148**

Source: Important Bird Areas of Canada (www.ibacanada.ca); [a] CWS unpublished data (acquired 2 May 2014); [b] Robertson et al. (2002); [c] Robertson and Elliot (2002).

6.0 ENVIRONMENTAL EFFECTS ASSESSMENT

The environmental effects predictions and significance determinations in the EA (LGL and GXT 2013) are still valid for the 2014 Project. In addition, the same mitigation measures for the planned activities as identified in the 2013 EA and C-NLOPB screening are still appropriate and have not changed. GXT reaffirms its commitment to the mitigation measures outlined in the EA and associated documents and the C-NLOPB screening in 2013. Nonetheless, the following provides summaries of new information and literature that has become available since the submission of the EA in March 2013.

As discussed in the 2013 EA, the VEC approach is used to focus the assessment on those biological resources of most potential concern and value to society. The VECs included in the EA (LGL and GXT 2013) were fish and fish habitat, fisheries, seabirds, marine mammals, sea turtles, and species at risk.

6.1 Fish and Fish Habitat VEC

New studies on the effects of sound, including airgun pulses, on fish that have been published since the submission of the EA are summarized below. This newly available information does not affect the outcome of the effects assessment. As indicated in Table 5.4 of the EA (LGL and GXT 2013), sound produced as a result of the proposed Project (airgun array sound being the worst-case scenario) is predicted to have *negligible* to *low* magnitude residual effects on the various life stages of the Fish and Fish Habitat VEC for a duration of *<1 month* to *1 to 12 months* over an area of *<1* to *11-100 km*^{2}. Based on these criteria ratings, the *reversible* residual effects of *continuous* project-related sound on the Fish and Fish Habitat VEC are predicted to be *not significant* (Table 5.5 of the EA).

6.1.1 New Information on Effects of Sound on Fish and Marine Invertebrates

Morley et al. (2013) considered invertebrates important when examining the impacts of anthropogenic noise. Although their review focused on terrestrial invertebrates, they noted that invertebrates, because of their short life cycle can provide model systems for evaluating the effects of noise on individual fitness and physiology, thereby providing data that can be used to draw stronger, ecologically valid conclusions.

In a recent study, Solé et al. (2013) exposed four caged cephalopod species to low-frequency (50–400 Hz) sinusoidal wave sweeps (with a 1-second sweep period for 2 hrs) with received levels of 157 ± 5 dB re 1 µPa, and peak levels up to 175 dB re 1 µPa. Besides exhibiting startle responses, all four species examined received damage to the statocyst, which is the organ responsible for equilibrium and movement. The animals showed stressed behaviour, decreased activity, and loss of muscle tone. When the shore crab *Carcinus maenas* was initially exposed to ship-noise playbacks, it consumed more oxygen, indicating a higher metabolic rate and potentially more stress; however, there were no changes in physiological responses to repeated exposure (Wale et al. 2013). Heavier crabs were more responsive than lighter crab (Wale et al. 2013). Celi et al. (2013) exposed red swamp crayfish (*Procambarus clarkia*) to linear sweeps with a frequency range of 0.1 to 25 kHz and a peak amplitude of 148 dB re 1 µPa rms at 12 kHz for 30 min. They found that the noise exposure caused changes in the haemato-immunological parameters (indicating stress) and reduced agonistic behaviours.

Fewtrell and McCauley (2012) exposed squid (*Sepioteuthis australis*), pink snapper (*Pagrus auratus*), and trevally (*Pseudocaranx dentex*) to pulses from a single airgun. The received sound exposure levels (SELs) ranged from 120 to 184 dB re 1 dB re 1 µPa^2·s. Increases in alarm responses were seen in the squid and fish at SELs >147–151 dB re 1 µPa^2·s; the fish swam faster and formed more cohesive groups in response to the airgun

sounds, and squid were seen to discharge ink or change their swimming pattern or vertical position in the water column.

Bui et al. (2013) examined the behavioural responses of Atlantic salmon (*Salmo salar L.*) to light, sound, and surface disturbance events. They reported that the fish showed short-term avoidance responses to the three stimuli. Salmon that were exposed to 12 Hz sounds and/or surface disturbances increased their swimming speeds.

Peña et al. (2013) used an omnidirectional fisheries sonar to determine the effects of a 3-D seismic survey off Vesterålen, northern Norway, on feeding herring (*Clupea harengus*). They reported that herring schools did not react to the seismic survey; no significant changes were detected in swimming speed, swim direction, or school size when the drifting seismic vessel approached the fish from a distance of 27 km to 2 km over a 6 h period. Peña et al. (2013) attributed the lack of response to strong motivation for feeding, the slow approach of the seismic vessel, and an increased tolerance to airgun sounds. This study contrasts with the findings of some previous studies that reported decreases in catch rates during seismic surveys (e.g. Løkkeborg et al. 2012).

Miller and Cripps (2013) used underwater visual census to examine the effect of a seismic survey on a shallow-water coral reef fish community in Australia. The census took place at six sites on the reef prior to and after the survey. When the census data collected during the seismic program were combined with historical data, the analyses showed that the seismic survey had no significant effect on the overall abundance or species richness of reef fish. This was in part attributed to the design of the seismic survey (e.g. ≥400 m buffer zone around reef) which reduced the impacts of seismic sounds on the fish communities by exposing them to relatively low SELs (<187 dB re 1 $\mu Pa^2 \cdot s$).

Hastings and Miksis-Olds (2012) measured the hearing sensitivity of caged reef fish following exposure to a seismic survey in Australia. When the auditory evoked potentials (AEP) were examined for fish that had been in cages as close as 45 m from the pass of the seismic vessel and at water depth of 5 m, there was no evidence of temporary threshold shift (TTS) in any of the fish examined, even though the cumulative SELs had reached 190 dB re 1 $\mu Pa^2 \cdot s$.

6.2 Fisheries VEC

New studies on the effects of airgun sounds on fisheries that have been published since the submission of the EA are summarized below. The degree of overlap between fishing activity and seismic activity that could occur during the 2014 Project is unknown at the moment, but will be monitored and information exchanged before and during the seismic survey. As described above (Section 5.4) the most effective way to prevent overlap between the research surveys is to exchange detailed locational information and implement a temporal and spatial separation plan, as described in the 2013 EA.

As discussed in the 2013 EA, the seismic lines for the 2014 program will be widely spaced (typically 50+ km apart) with occasional crossing points, effectively resulting in "one time" exposures of biota and local fishing grounds to maximum energy from the array. With application of the mitigations in place, effects of seismic survey sound on the Fisheries VEC (including fisheries research science surveys) are predicted to be a *negligible* to *low* magnitude during *1-12 months* over an area of *<1* to *11-100 km^2* (see Table 5.7 in the EA). Based on these criteria ratings, the *reversible* residual effects of seismic survey sound on the Fisheries VEC are predicted to be *not significant* (Table 5.8 in the EA). The newly available information does not affect the outcome of this effects assessment.

6.2.1 New Information on Effects of Seismic Sound on Fisheries

Handegard et al. (2013) examined different exposure metrics to explain the disturbance of seismic surveys on fish. They applied metrics to two experiments in Norwegian waters (Nordkappbanken and Vesterålen), during which fish distribution and fisheries were affected by airguns. Even though the disturbance for Nordkappbanken was greater, Vesterålen appeared to have the stronger SEL, based on a relatively complex propagation model. Handegard et al. (2013) recommended that simple sound propagation models should be avoided and that the use of sound energy metrics like SEL to interpret disturbance effects should be done with caution. In this case, the simplest model (exposures per area) best explained the disturbance effect.

Hovem et al. (2012) used a model to predict the effects of airgun sounds on fish populations. Modeled SELs were compared with empirical data and were then compared with startle response levels for cod. Their preliminary analyses indicated that seismic surveys should occur at a distance of 5–10 km from fishing, in order to minimize potential effects.

6.3 Marine Birds VEC

There have been no new studies on the effects of airgun sounds on birds since the submission of the EA. The effect of underwater sounds on birds remains mostly unknown. While supporting data on actual effects are few, the EA predicted that there will be *no significant effects* (Table 5.11 in the EA) on seabirds from the sound because the magnitude of the effect (if it occurs) is predicted to be *negligible* to *low*, the geographic extent will be small (probably < *1 km²* to *1-10 km²*), and duration will be *1-12 months* (Table 5.10 in the EA).

6.4 Marine Mammals and Sea Turtles VEC

The potential effects of marine seismic activities on marine mammals and sea turtles include masking, disturbance, hearing impairment, and physical or physiological effects. Additionally, a few cases of strandings in the general area where a seismic survey was ongoing have led to speculation concerning a possible link between seismic surveys and strandings (e.g., Castellote and Llorens 2013). The potential effects of airgun sounds on marine mammals and sea turtles were reviewed in the previously prepared EA for the GXT LabradorSPAN Survey, which included new and relevant literature up to March 2013. New studies on the effects of sound, including airgun pulses, on marine mammals that have been published since the submission of the EA are summarized below.

This newly available information, summarized below, on the effects of sounds and airgun pulses on marine mammals does not affect the outcome of the effects assessment. As per Table 5.13 of the EA, GXT's seismic program is predicted to have *negligible* to *low* hearing impairment/physical effects on marine mammals, over a duration of *1 to 12 months*, in an area *<1 km²* to *1-10 km²*. Disturbance effects from Project sound on marine mammals would likely be *low*, over *1 to 12 months*, in an area of *11–100* or *101–1,000 km²*. Therefore, effects from airgun sounds on marine mammals are judged to be *not significant* (Table 5.14 in the EA). GXT's seismic program is predicted to have *low* disturbance effects on sea turtles, over a duration of *1 to 12 months*, in an area *11–100 km²*, and it is predicted to have *negligible* to *low* physical effects on sea turtles, over a duration of *1 to 12 months*, in an area *<1 to 1–10 km²* (Table 5.15 of the EA). Therefore, effects on sea turtles are judged to be *not significant* (Table 5.16 in the EA).

6.4.1 New Information on Masking Effects

Based on preliminary modelling, Wittekind et al. (2013) reported that airgun sounds may reduce the communication range of blue whales (*Balaenoptera musculus*) and fin whales (*Balaenoptera physalus*) up to 2000 km from a seismic source, depending on the frequencies of the vocalizations. Some cetaceans are known to increase the source levels of their calls in the presence of elevated sound levels, shift their peak frequencies in response to strong sound signals, or otherwise modify their vocal behaviour in response to increased noise (Tyack and Janik 2013).

6.4.2 New Information on Disturbance Effects

Responsiveness of bowhead whales (*Balaena mysticetus*) to seismic surveys can be quite variable depending on their activity (feeding vs. migrating). Bowhead whales on their summer feeding grounds in the Canadian Beaufort Sea showed no obvious reactions to pulses from seismic vessels at distances of 6–99 km and received sound levels of 107–158 dB on an approximate rms basis (Richardson et al. 1986). However, Robertson et al. (2013) showed that subtle but statistically significant changes in surfacing–respiration–dive cycles were detected with analysis, including shorter surfacings, shorter dives, and decreased number of blows per surfacing.

Cerchio et al. (2014) examined the effects of seismic survey activities on singing humpback whales (*Megaptera novaeangliae*) in a breeding area off Angola during 2008. They suggested that the breeding display of humpback whales may have been disrupted by seismic sounds, as singing activity declined with increasing received levels.

Preliminary findings of a monitoring study of narwhals (*Monodon monoceros*) in Melville Bay, Greenland, during summer and fall 2012 showed no short-term effects of seismic survey activity on narwhal distribution, abundance, migration timing, and feeding habits; in addition, there were no reported effects on narwhal hunting (Heide-Jørgensen et al. 2013a). These findings do not seemingly support a suggestion by Heide-Jørgensen et al. (2013b) that seismic surveys in Baffin Bay may have delayed the migration timing of narwhals, thereby increasing the risk of narwhals to ice entrapment.

Kastelein et al. (2013a) examined impulsive sound levels that caused brief behavioural response (e.g., sudden changes in swimming speed or direction) in a captive harbour porpoise (*Phocoena phocoena*). A male porpoise was exposed to a single impulsive sound every three min at various source levels and its behaviour was observed. At a received SEL of 92 dB re 1 $\mu Pa^2 \cdot s$ and a sound pressure level (SPL) of 122 dB re 1 µPa zero-to-peak, a 50% brief response rate was documented; below SELs of 65 dB re 1 $\mu Pa^2 \cdot s$, no response was observed.

Thompson et al. (2013) reported decreased densities and reduced acoustic detections of harbour porpoise in response to a seismic survey in Moray Firth, Scotland, at ranges of 5–10 km (SPLs of 165–172 dB re 1 µPa; SELs of 145–151 dB $\mu Pa^2 \cdot s$); however, animals returned to the area within a few hours. In contrast, Dall's porpoises (*Phocoenoides dalli*) seem relatively tolerant of airgun operations (MacLean and Koski 2005; Bain and Williams 2006), although they too have been observed to avoid large arrays of operating airguns (Calambokidis and Osmek 1998; Bain and Williams 2006). The apparent tendency for greater responsiveness in the harbour porpoise is consistent with their relative responsiveness to boat traffic and some other acoustic sources (Richardson et al. 1995; Southall et al. 2007).

6.4.3 New Information on Temporary Threshold Shift

Finneran and Schlundt (2013) and Kastelein et al. (2013b) noted that frequency, duration of the exposure, and occurrence of gaps within the exposure can influence the auditory effect on marine mammals. Additionally,

recent research has shown that sound exposure can cause cochlear neural degeneration, even when threshold shifts and hair cell damage are reversible (Liberman 2013). These findings have raised some doubts as to whether temporary threshold shift (TTS) should continue to be considered a non-injurious effect.

Schlundt et al. (2013) reported that the potential for seismic surveys using airguns to cause auditory effects on dolphins may be lower than previously thought; this may be due to the low-frequency content of airgun sounds compared to higher-frequency hearing ability of dolphins. Based on behavioural tests, Schlundt et al. (2013) reported no measurable TTS in bottlenose dolphins (*Tursiops truncatus*) after exposure to 10 impulses from a seismic airgun with a cumulative SEL of ~195 dB re 1 $\mu Pa^2 \cdot s$; results from auditory evoked potentials (AEP) measurements were more variable (Schlundt et al. 2013).

When beluga whales (*Delphinapterus leucas*) were exposed to fatiguing noise with sound levels of 165 dB re 1 µPa for durations of 1 to 30 min at frequencies of 11.2 to 90 kHz, the highest TTS with the longest recovery time was produced by the lower frequencies (11.2 and 22.5 kHz); TTS effects also gradually increased with prolonged exposure time (Popov et al. 2013a). Popov et al. (2013b) also reported that TTS produced by exposure to a fatiguing noise was larger during the first session (or naïve subject state) with a beluga whale than TTS that resulted from the same sound in subsequent sessions (experienced subject state). Similarly, Nachtigall and Supin (2013) reported that false killer whales (*Pseudorca crassidens*) are able to change their hearing sensation levels when exposed to loud sounds, such as warning signals or echolocation sounds. Supin et al. (2013) reported that SEL may not be a valid metric for examining fatiguing sounds on beluga whales.

Initial evidence from prolonged (non-pulse and pulse) exposures suggested that some pinnipeds (harbour seals in particular) as well as harbour porpoise incur TTS (and thus permanent threshold shift or PTS) at somewhat lower received levels than do small odontocetes exposed for similar durations (Kastelein et al. 2013c). Kastelein et al. (2013c) suggested that for a harbour seal exposed to octave-band white noise centred at 4 kHz for 60 min with mean SPLs of 124–148 re 1 µPa, the onset of PTS would require a level of at least 22 dB above the TTS onset. A porpoise exposed to a 1.5 kHz continuous sound at a mean SPL of 154 dB re 1 µPa for 60 min (equaling a cumulative SEL of 190 dB re 1 $\mu Pa^2 \cdot s$) incurred a mean TTS of 14 dB at a measured frequency of 1.5 kHz and 11 dB at 2 kHz (Kastelein et al. 2013b). Tougaard et al. (2013) proposed a TTS criterion of 165 dB re 1 $\mu Pa^2 \cdot s$ for porpoises based on data from two studies. Kastelein et al. (2013c) also reported that the equal energy model is not valid for predicting TTS in harbour porpoise or harbour seals.

6.4.4 Noise Criteria

The National Oceanic and Atmospheric Administration (NOAA) published draft guidance for assessing the effects of anthropogenic sound on marine mammals/acoustic threshold levels for onset of permanent and temporary threshold shifts on 23 December 2013 (NOAA 2013). These guidelines are based on exposure characteristics that are specific to particular groups of marine mammal species and to particular sound types (NOAA 2013). The U.S. National Marine Fisheries Service (NMFS) has taken at least some of the recommendations made by Southall et al. (2007) into account (NOAA 2013). The new sound exposure criteria in the U.S. for marine mammals will account for the now additional scientific data on TTS, the expected offset between the TTS and PTS thresholds, differences in the acoustic frequencies to which different marine mammal groups are sensitive (e.g., M-weighting or generalized frequency weightings for various groups of marine mammals, allowing for their functional bandwidths), and other relevant factors. NOAA is still working on developing guidelines regarding the effects of anthropogenic sound on marine mammal behaviour (NOAA 2014).

6.5 Effects of the Project on Species of Special Status

An overview of all species considered at risk under *SARA* and/or by COSEWIC that are likely or may occur in the Study Area was provided in Table 4.1. No critical habitat has been defined for the Study Area. As discussed in Section 4.6 of the EA (LGL and GXT 2013) and presented in Table 5.1 earlier, *SARA* species of relevance to the Study Area include:

- white shark; northern, spotted, and Atlantic wolffish;
- Ivory Gull, Harlequin Duck, and Barrow's Goldeneye;
- blue, northern bottlenose, Sowerby's beaked, and fin whale; polar bear; and
- leatherback sea turtle.

As per the detailed effects assessment contained in Section 5.8.4 of the EA, physical effects of the Project on the various life stages of wolffishes and the white shark will range from *negligible* to *low* over a duration of *1-12 months*, within an area of *<1 km*^{2} (Table 5.18 in the EA). Behavioural effects may extend out to a larger area but are still predicted to be *not significant* (Table 5.19 in the EA). The mitigation measure of ramping up the airgun array (over a 30 min period) is expected to minimize the potential for impacts on wolffishes and the white shark.

As per the detailed effects assessment in Section 5.8.6 of the EA, the predicted residual effects of the Project on the Ivory Gull, Harlequin Duck, and Barrow's Goldeneye are *not significant.* These species are unlikely to occur in the Study Area, particularly during the summer when seismic surveys are likely to be conducted and mitigation measures will minimize effects of the Project.

Based on available information, the blue whale, Sowerby's beaked whale, and leatherback sea turtle are not expected to occur frequently in the Study Area. With mitigation measures in place and as per the detailed effects assessment in Section 5.8.7 of the EA, the Project is predicted to have *no significant effect* (hearing impairment/physical or behavioural) on *SARA* Schedule 1 marine mammals and sea turtles.

In summary, potential effects of the proposed 2-D seismic program are not expected to contravene the prohibitions of *SARA* (Sections 32(1), 33, 58(1)).

7.0 CUMULATIVE EFFECTS

Section 6.0 of the EA of the LabradorSPAN Survey addressed the potential cumulative effects from past, present and reasonably foreseeable projects. For the most part, patterns of "other users" in the Labrador Sea have not changed since early 2013. The primary difference is a small number of new projects listed on the C-NLOPB's Public Registry (as indicated by * in the bulleted list below).

Offshore oil and gas industry projects listed on the C-NLOPB public registry (www.cnlopb.nl.ca as viewed 5 May 2014) for offshore Labrador include:

- TGS NOPEC Geophysical Company ASA and Multi Klient Invest AS Offshore Labrador Seafloor and Seabed Sampling Program, 2014-2019* [project includes multibeam bathymetric surveys];
- Multi Klient Invest AS Labrador Sea seismic program, 2014-2018*;
- ARKeX Ltd., TGS-NOPEC Labrador Sea Gravity Gradient Survey, 2014-2018*;
- GXT GrandSPAN Marine 2-D Seismic, Gravity and Magnetic Survey, 2014-2018*;
- Husky Energy 2-D and 3-D seismic, vertical seismic profiling (VSP), and geohazard surveys offshore Labrador, 2010 to 2017;
- Investcan Energy Corporation 2-D and 3-D seismic, vertical seismic profiling (VSP), and geohazard surveys offshore Labrador, 2010 to 2017; and
- Chevron Canada Resources 2-D and 3-D seismic, and geohazard surveys offshore Labrador, 2011 to 2017.

Although any of these programs has a potential to be active in some part of GXT's Project Area in 2014, those that will be active when GXT is present is not yet know. If GXT's operations do overlap spatially with another seismic project on the Labrador Shelf in 2014, seismic operators will need to communicate with each other to ensure a spatial and/or temporal separation of operations, which is a standard practice in the industry. Concurrent seismic programs in the same general area have occurred several times in Atlantic Canada in recent years, as well as in other jurisdictions. A key mitigation approach for all of these programs is a simultaneous operations plan, which would aim to establish a minimum separation distance that both/all seismic operators would maintain while acquiring seismic data. Not only is this important for mitigating cumulative effects, but separation is also necessary to prevent the sound from nearby arrays from interfering with the each other's data recording.

Considering that the scope of the activities listed above still falls within the range of those assessed in the EA (LGL and GXT 2013), and with a simultaneous operations plan and all of the other mitigation measures in place, no significant residual cumulative effects are predicted.

8.0 MONITORING AND MITIGATION MEASURES

The effects assessments in the EA consider the potential effects of the LabradorSPAN Project in light of the specific mitigation measures that will be applied for this Project in this environment. The purpose of these measures is to eliminate or reduce the potential impacts that might affect the area VECs. GXT recognizes that - as in 2013 - the careful and thorough implementation of, and adherence to, these measures will be critical for ensuring that the Project does not result in unacceptable environmental consequences.

This mitigation measures that were proposed in Section 5.6 of the EA have not changed. Many were specially tailored to this program, while others are founded in regulations, guidelines, or "best environmental practices". Collectively, they were based on or take guidance from several sources, including discussions and advice received during consultations for this Project and for other relevant EAs, the C-NLOPB Scoping Documents, and the Environmental Planning, Mitigation and Reporting guidance in Appendix 2 of the Board's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), DFO's *Statement of Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* and other standards and guidance, such as the One Ocean *Protocol for Seismic Survey Programs in Newfoundland and Labrador* (2013).

Table 8.1 summarizes the mitigation measures, organized by VEC, all of which were implemented during the 2013 LabradorSPAN program work and will be again for 2014. They include such procedures as close advance and continuing communications with fish harvesting interests (e.g. e-mails, web site, telephone contact), avoidance of active fishing areas, the use of two FLOs (one provided by the FFAW and one representing Inuit/Nunatsiavut interests) to aid in coordination with fishing activities, use of a SPOC to help communications between the survey and fishers, the establishment of a Fishing Gear Compensation Program, the use of dedicated MMSOs to monitor marine for mammals and turtles, to record seabird and other wildlife data and to monitor ramp-ups (i.e., soft starts) of the airgun arrays, and to implement shut downs of the seismic sound source array when required.

Table 8.1 Summary of mitigations measures by potential effect.

Potential Effects	Primary Mitigations
Interference with fishing vessels / mobile and fixed gear fisheries	• Advance communications, liaison and planning to avoid active fishing areas • Continuing communications throughout the program • On-board Fisheries Liaison Officers (FLOs) - 1 representing FFAW and 1 representing Inuit/Nunatsiavut interests • Single Point of Contact (SPOC) • Other advisories and communications - e.g. continuing e-mails, dedicated toll-free 24/7 telephone contact, dedicated web site (www.gxtspan.com), newsletters, notices to Coast Guard, CBC and OK coastal radio • Accessing Vessel Monitoring System (VMS) data • Avoidance • Start-up meetings on ships
Fishing gear damage	• Upfront communications, liaison and planning to avoid fishing gear • Use of scout vessel • SPOC; 24/7 toll-free telephone contact • Other advisories and communications • FLOs • Compensation program • Reporting and documentation • Start-up meetings on ships
Interference with shipping	• Advisories and at-sea communications • FLOs (for fishing vessels) • Use of scout vessel • SPOC (fishing vessels) • Accessing Vessel Monitoring System (VMS) data (for fishing vessels)
Interference with DFO/FFAW research program	• Plotting locations • Communications and scheduling • Avoidance
Temporary or permanent hearing damage/disturbance to marine animals	• Pre-watch of safety zone • Delay start-up if marine mammals or sea turtles are within 500 m • Ramp-up of airguns • Shutdown of airgun arrays for *endangered* or *threatened* marine mammals and sea turtles within 500 m • Use of qualified marine mammal and seabird observers (MMSOs) to monitor for marine mammals and sea turtles during daylight seismic operations
Temporary or permanent hearing damage/ disturbance to Species at Risk or other key habitats	• Pre-watch of safety zone • Delay start-up if marine mammals or sea turtles are within 500 m • ramp-up of airguns • Shutdown of airgun arrays for *endangered* or *threatened* marine mammals and sea turtles within 500 m • Use of qualified MMSO(s) to monitor for marine mammals and sea turtles during daylight seismic operations. [No critical habitat has been identified in or near the Study Area to May 2014.]
Injury (mortality) to stranded seabirds	• Daily monitoring of vessel • Handling and release protocols • Minimize lighting if safe
Seabird oiling	• Adherence to MARPOL • Spill contingency and response plans • Use of solid streamer

9.0 CONCLUSIONS

The geophysical surveys for 2014 Project fall within the scope of GXT's original EA, which was approved by the CNLOPB in 2013. Judgments of the significance of potential adverse effects presented in the original EA still apply to the 2014 Project as the scope of the assessment has not changed and the mitigations measures and protocols identified through the 2013 assessment and screening process will be applied in 2014.

Residual effects from the geophysical surveys on all assessed VECs are judged to be *not significant*. The level of confidence is *medium to high* for residual effects of airgun sounds on fish and fisheries, and *high* for residual effects of airgun sounds on seabirds. For marine mammals and sea turtles, the level of confidence is *medium* for residual effects related to hearing/physical impacts and *high* for residual effects related to disturbance.

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APPENDIX 1:

EXAMPLES OF PRINTED AND/OR E-MAILED 2014 CONSULTATION MATERIALS

GXT's LabradorSPAN 2-D Seismic, Gravity and Magnetic Survey, 2013-2015

GXT's LabradorSPAN program is a three-year marine 2D seismic, gravity and magnetic survey on and near the Labrador Shelf and slope areas. (See Map 1, below.) The project uses a conventional seismic ship, such as the M/V *Discoverer* (used in 2013), which tows a sound source (airgun array, up to 6300 in^3 total volume) and a single streamer (a buoyant cable, up to 12 km long) containing receiving (listening) hydrophones. The sound energy received by the hydrophones is recorded by computers on board the seismic ship. The seismic vessel also passively collects and records gravity and magnetic data at the same time, and has an echo sounder for depth soundings.

A support vessel is also used, such as the M/V *Polar Prince* (used in 2013). All vessels used during the Project are approved for operation in Canadian waters by Transport Canada, DNV (the vessels' classification society) and the C-NLOPB. The ships stay fully within the Project Area (Map 1 and 2) when acquiring data or when any equipment is deployed in the water. The work does not enter within 22 km of coastlines, and stays completely outside the Nunatsiavut Zone and the Hawke Channel box.

The EA for the LabradorSPAN Program anticipates that a maximum annual acquisition of 8,500 line km could occur during the period. Lines for GXT's SPAN programs are typically long and widely spaced within the Project Area. The potential operational timeframe of the surveys is within the period 1 June to 30 November in any year between 2013 and 2015, but exact timing of the work depends on results and interpretation of earlier work and other factors.

The Environmental Screening of this Project was completed by the C-NLOPB in August 2013, after a GXT's filings and a public review, and the Board's Determination (dated 14 August) stated that it "considered this information and the advice of the Boards' advisory agencies and have determined that the proposed project, following the application of mitigation measures, is not likely to cause significant adverse environmental effects". (The full filings related to the assessment of LabradorSPAN is available at http://www.cnlopb.nl.ca/environment/gxtc.shtml).

2013 Work

The first year of the LabradorSPAN program was conducted successfully in August - November 2013; a total of nearly 6,600 km was acquired during the 70 days of operation. During the program all planned communication and mitigation mechanisms were applied and in place (e.g. advance and continuing communications with fishing groups, Single Point of Contact, dedicated web site, toll-free phone number operating 24/7, Coast Guard Notices to Shipping, CBC Radio and OK Radio, two Fisheries Liaison Officers and two Marine Mammal and Seabird Monitors on the survey ship, a fishing gear damage program, fisheries and fisheries science avoidance, etc.) See Table 1 below for details.

GXT LabradorSPAN - Proposed 2014 Work

For the proposed 2014 LabradorSPAN program, GXT will use similar ships, equipment, methods and mitigations working within the same Project Area. It will use a seismic ship and a support ship, and seismic equipment (including the array and streamer) that fall within the original 2013 EA scope.

The array to be used will be up to 6300 in^3 in volume, operating at 2000 psi, towed at a speed of ~4.5 knots (8.3 km/h) when in acquisition, at depths between 8 m and 11 m. The array will activate every 19 to 22 seconds. The single seismic hydrophone cable used will be up to 12 km long, deployed at a depth of between 9 m and 15 m.

This year, GXT is requesting to permit approximately 5,300 km of seismic acquisition within the LabradorSPAN Project Area (see Map 2, below; please keep this map confidential within your group / company), though it is expected that less than this amount will actually be acquired. As with the 2013 work, the lines will be widely spaced (typically 50+ km apart, except where they intersect) and many of them are long (e.g. up to 500 km). No acquisition or gear deployment will occur outside the Project Area, including within the Nunatsiavut Zone or the Hawke Channel box.

In 2014, GXT expects the acquisition in Labrador to begin in early June, and could continue potentially into November, although this would not be continuous operation in the area; actual operational time within the LabradorSPAN Project Area is expected to be less than 30 days. The timing of the operations will depend on the timing of work on other projects and other factors. Acquisition of specific lines will also depend on local factors at the time. Details of the planned work, including maps, will be provided to fishing and other relevant interests in advance during the survey so that they can supply feedback about the proposed plans, as was done during the 2013 survey.

Each of the communications and other mitigation procedures applied in 2013 will be used in 2014, as will all other environmental protection, emissions control, safety and emergency measures (see Table 1 below) and as required in the C-NLOPB's Screening Report. No requirements for additional mitigations beyond those used in 2013 have been identified.

Contacting GXT

If you have any questions, advice, concerns or other comments for GXT about the planned 2014 LabradorSPAN work, or want to communicate or meet with GXT for any other reason (before or during the survey), please contact GXT's managers, as indicated below. GXT will also continue to provide you with updated information throughout the program as the work moves forward.

Rob Pitt (GXT Environmental Manager)
Tel: 709-682-3342 or 709-753-9499
E-mail: rpitt@gxt.com

Dean Kennedy (GXT Project Manager)
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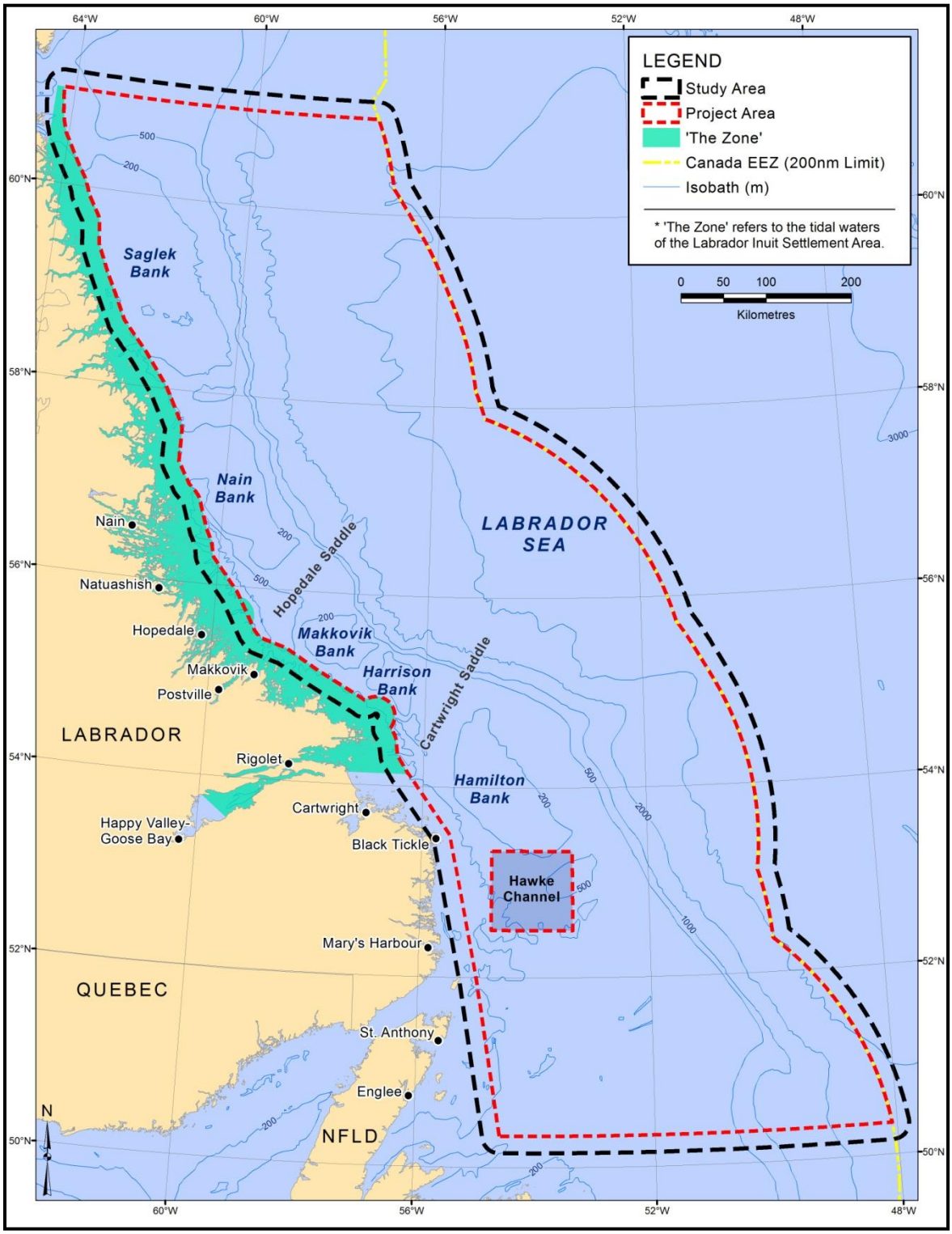
E-mail: dkennedy@gxt.com

Project Fax: 709-747-6248 Project website: http://gxtspan.com

Table 1: Summary of mitigations measures by potential effect

Potential Effects	Primary Mitigations
Interference with fishing vessels / mobile and fixed gear fisheries	• Advance communications, liaison and planning to avoid active fishing areas • Continuing communications throughout the program • On-board Fisheries Liaison Officers (FLOs) - 1 representing FFAW and 1 representing Inuit/Nunatsiavut interests • Single Point of Contact (SPOC) • Other advisories and communications - continuing e-mails, dedicated toll-free 24/7 telephone contact, dedicated web site (gxtspan.com), newsletters, notices to Coast Guard, CBC and OK coastal radio • Accessing Vessel Monitoring System (VMS) data • Avoidance • Start-up meetings on ships
Fishing gear damage	• Upfront communications, liaison and planning to avoid fishing gear • Use of scout vessel • SPOC; 24/7 toll-free telephone contact • Other advisories and communications • FLOs • Compensation program • Reporting and documentation • Start-up meetings on ships
Interference with shipping	• Advisories and at-sea communications • FLOs (for fishing vessels) • Use of scout vessel • SPOC (fishing vessels) • Accessing Vessel Monitoring System (VMS) data (for fishing vessels)
Interference with DFO/FFAW research program	• Plotting locations • Communications and scheduling • Avoidance
Temporary or permanent hearing damage/disturbance to marine animals	• Pre-watch of safety zone • Delay start-up if marine mammals or sea turtles are within 500 m • Ramp-up of airguns • Shutdown of airgun arrays for *endangered* or *threatened* marine mammals and sea turtles within 500 m • Use of qualified MMO(s) to monitor for marine mammals and sea turtles during daylight seismic operations
Temporary or permanent hearing damage/ disturbance to Species at Risk or other key habitats	• Pre-watch of safety zone • Delay start-up if marine mammals or sea turtles are within 500 m • ramp-up of airguns • Shutdown of airgun arrays for *endangered* or *threatened* marine mammals and sea turtles within 500 m • Use of qualified MMO(s) to monitor for marine mammals and sea turtles during daylight seismic operations. [No critical habitat has been identified in or near the Study Area to April 2014.]
Injury (mortality) to stranded seabirds	• Daily monitoring of vessel • Handling and release protocols • Minimize lighting if safe
Seabird oiling	• Adherence to MARPOL • Spill contingency and response plans • Use of solid streamer



Map 1. GXT LabradorSPAN 2013 - 2015 Project Area / Study Area

[CONFIDENTIAL MAP REMOVED]

Map 2: Potential lines for 2014 Project Area CONFIDENTIAL

GX Technology Canada Ltd. (GXT) is planning to conduct a marine 2D (two-dimensional) seismic survey offshore north-eastern Canada, in the Labrador Sea area between 2013 and 2015, within the regulatory jurisdiction of the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB). The first phase of the survey was completed successfully in 2013.

This brochure describes the seismic survey, our environmental protection procedures, and provides project contact information. We would like to hear from you if you have any additional comments or would like more information.

2D Seismic Survey, Offshore Labrador Shelf 2013 - 2015

GX TECHNOLOGY

GX Technology Canada Ltd.
An ION company
www.iongeo.com

GX Technology Canada Ltd.

(GXT)

PROJECT DESCRIPTION

GXT is conducting a two-dimensional (2D) seismic survey offshore along the Labrador Shelf. It began in August 2013 and could continue to 2015.

The survey uses a single seismic ship, and a support ship. The seismic ship tows a sound source array and one 10-11 km long hydrophone (listening) streamer / cable near the sea surface, travelling at about 9 km/hour as it collects data.

The ship will also have biological and resource experts (Marine Mammal Observers and Fisheries Liaison Officers) on board to help protect marine mammal and seabirds, help with fisheries matters, protect Nunatsiavut interests and record wildlife sightings. These experts include an Inuit / Nunatsiavut representative on the seismic ship.

No work will occur within the Nunatsiavut Zone (the Tidal Waters of the Labrador Inuit Settlement Area, as defined in the Labrador Inuit Land Claims Agreement. (See map on the cover: Project Area is shown in darker blue).The closest point to shore will be about 25 km.

OBJECTIVE OF THE WORK

The project is a regional Basin Span survey designed to provide a better understanding of the offshore geology of the Labrador Shelf, and to use this information to identify new petroleum exploration opportunities. GXT's Basin Span programs are different from other surveys because they look very deep to understand broad regional structures. This unique information will be used to determine the regional extent of geological formations not previously known through conventional methods.

SCHEDULE

The possible survey season is June through November, 2013 to 2015, depending on ice, local weather conditions, and other marine activities (e.g. fish harvesting).

The seismic ship will work continuously (24-hour operations when possible) during the survey. Unlike most surveys, GXT's Span programs activate the airguns only about half as often as other 2D seismic programs to allow time to listen for the very deep sound echoes. Crew changes will be made typically via port call, usually every 6 – 8 weeks.

ENVIRONMENT

GX Technology Canada Ltd. (GXT) prepared a detailed Environmental Assessment of potential effects on the surrounding environment in 2013, which included information and advice received during the consultations that year.

The main sensitivities identified in and near the Project Area include fisheries, marine mammals, fish species, and birds.

GXT has had a lot of experience working in other sensitive areas in the north without any spills, or impacts on marine wildlife, and none occurred during the 2013 Labrador program. We want to continue to work with you, to keep our good record and improve opportunities for local people.

If you have any additional environmental questions or comments for GXT, please contact us at the email addresses or phone numbers below.

PROTECTION & MITIGATION

GXT will apply a comprehensive set of precautions and mitigation measures to prevent or reduce the likelihood of affecting the fisheries, wildlife and the environment in general, as we did in 2013.

To reduce potential effects on fisheries, GXT will stay out of the Hawke Channel area, avoid active fishing, plan activities away from key species areas during key seasons, avoid fisheries research surveys, and maintain close consultation / information exchange with fishing groups during the survey.

Onboard Nunatsiavut and FFAW Fisheries Liaison Officers will provide dedicated marine radio contacts for fishing vessels that might be in the vicinity of the survey vessel to help identify and avoid gear locations, discuss potential interactions, find solutions, and provide guidance to the ship.

GXT, through its on-shore managers and on-board representatives, will also communicate with appropriate fisheries organizations to inform them of planned survey activities and to help ensure good information exchange with fisheries participants. This worked well in 2013 and no fisheries problems or conflicts were reported.

Relevant information about the survey will also be publicized through project updates to established communications agencies, such as the Coast Guard Notices to Shipping, CBC Radio's Fisheries Broadcast and OK Radio, as well as direct communications between the survey vessel and fishing boats via marine radio at sea. GXT also maintains a dedicated survey internet web site to provide project information and survey updates (http://gxtspan.com).

To avoid or reduce potential impacts on marine mammals (particularly whales) GXT will follow the Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment developed by Fisheries and Oceans Canada (DFO, 2004). The full document is available on the internet at http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/seismic-sismique/statement-enonce-eng.asp.

The Statement was created to formalize and standardize the mitigation measures used in Canada for seismic surveys in the marine environment.

Other environmental protection measures include waste management, grey / black water disposal methods, reduction of air emissions, emergency (spill) response plans, and procedures and drills, that meet and exceed national and international standards (e.g. MARPOL).

GXT also meets with all project crew before project start-up to make sure they know and respect all of our environmental commitments and requirements.

THANK YOU FOR YOUR INTEREST

Please contact us if you have any questions, concerns or would like more information about the project.

Robert Pitt, GXT - Environmental Manager
rpitt@gxt.com 709-682-3342

Dean Kennedy, GXT - Project Manager
dkennedt@gxt.com 709-682-2336

GX Technology Canada Ltd. (GXT) pannaigutiKajut imappisuami Kaujisagiamut atullutik taijamik 2D (maggolingatillugu-takujausok) ikkami Kaujisallutik imappiup silatâni taggâni kangiani Canadami, Labrador imappisuangani akungani 2013-nami ammalu 2015-namut, maligatsakut ammalu pitsatuniKattitautillugit taikkununga Canada Newfalâmi ammalu Labradorimi Imappisuami Utsualuligijikkunut AngajukKauKatigenginnut. Sivullipâmi suliagijaulauttuk Kaujisannik pijagelauttuk kajusitsiatluni 2013-nami.

Tânna Kimigguak nalunaittisijuk ikkami Kaujisannisanganut, namminivut avatik paigijaugutinganut piusigisimajanginnut, ammalu sakKititsimijuk suliatsamut Kaujisapviutausonut KaujigatsaKalluni. Tusagumavugut ilitsinit uKagiallagumagutsi upvalu Kaujigiallagumagutsi.

2D Ikkami Kaujisannik, Imappisuap kitâni Labrador Ikkangani 2013 - 2015

GX Technology Canada Ltd.
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GX Technology Canada Ltd.

(GXT)

SULIATSAMUT NALUNAIGUTINGA

GXT Kaujisajut maggolingatillugu takujausomi ikkami Kaujisallutik imappisuap kitâni satjugiami Labradorip ikkangani. Pigiasilauttut Augus 2013-nami ammalu kajusilangajut 2015-namunut.

Tânna Kaujisannik atuKattajuk Kaujisattimik umiammik atausiutluni, ammalu ikajuttiKatlunillu asianik umiammik. Kaujisattik umiak kaliKattajuk nipiliusomik ammalu takiniKatlunillu kalijangit 10-11 km takiniKajuk (tusâjumik) kalijanga/waijalik ikkamut kalittauKattajuk, ingiggatluni sukkaniKatluni Kanitangani 9 km/sitontikkut katitsuitluni Kaujigialimminik.

Tânna umiak suliaKattiKammijuk omajuligijinnik ammalu ilisimallagijunik (Imappimi Omajunik kamajinnik ammalu Oganniatuligijet SuliaKattimik) ikimajunut ikajutlutik paigutiKagiamut imappimiutanik omajunik ammalu timmianik, ikajullutik oganniatuligijet pitjutigijanginnut paigillugit Nunatsiavut Kanuttogutigijanginnik ammalu allaKattalugit omajut takujanginnik. Tamakkua ilisimallagijut ilautitsivut Inuit/Nunatsiavut kiggatuttimi ikimaKatautlutik Kaujisattet umiangani.

SuliaKaninagitut akungani Nunatsiavut killingani (tiniKattajunut Labrador Inuit Satusattausimajop Iningani, tukitâttausimajutigut iluani Labrador Inuit Nunamut Satusattausimajop AngiKatigegutingani. (Takullugu nunanguak matungani. Suliatsagijaujop Ininga takutsaujuk tâttonitsami tungujuttami). Kaninnipâk nunamut Kaningitigilangajuk 25-imik.

TUGÂGUTINGA SULIATSAMUT

Tânna suliangujuk nunakKatigengituk koKattajumut Kaujisattaujuk piunitsamik tukisigiamut imappisuap ikkangata ininganik Labradorimi imappisuangani, ammalu atullutik Kaujigatsanik nalunaitsigiamut nutânik utsualunnut Kaujisagiamut pivitsagijaugajattunut. GXT-kut Iningata koKattajumut suliatsak adjigelungitut asinginnut Kaujisattausimajunit taimailingaluattuk takunnâKattamata itijummagimmut tukisigasuagiamut angijommat nunakKatigengitonninga tungavingata. Tânna adjiKangituk Kaujisattaujuk atuttaulangajuk Kaujigiamut nunakKatigengitonninganik iningatigut sivungani Kaujijaulautsimangitigut atutlutik nutânik piKutinik piusiKajunut.

SITONTISANGA

Tânna sitontiginiakKotanga naliuvingata Juni-uvuk pigiasilluni Novembera, 2013 tikillugunut 2015, isumagillugu sikunga, nunalet silanga, ammalu asigiallait imappisuami piniannigijauKattajunut (sollu iKalunniaKattajunut).

Tânna ikkami Kaujisannik umianga kajusinginnaniattuk suliagijamminik (24-sitontinik aulalluni pigunnanginnapata) Kaujisalippata. Adjigilungitangata asinginnut Kaujisattausimajunut, GXT-ikut suliatsanga aulatsiKattajut KummuKattajunut nipanik Kukiutet apvingitigut kisiani asinginnut maggolingajunut adjiliuKattajunut KaujisaKattajunut suliangujunut pivitsaKattiKagasuamut tusâgiamut itijummi innamanuamik. SuliaKattet tautseKattaniattut itsaviliasimalippata, taimailingaluanginnaKattaniattut tautselutik 6 – 8 wogini nâgaippata.

AVATIK

GX Technology Canada Ltd. (GXT) atuinnaguttisimalauttut Avatimmik Kimiggugemmata attuigajakKotunut Kanitangata avatinganik jâringani 2013, ilautitsilauttuk Kaujigatsanik ammalu uKautjigiajiujunik tusalauttanginnik taipsumani jâringani Kaujigatsanik Kaujititsigalaniammata.

Tamakkua attutausagaisot nalunaittaulauttut iluani ammalu Kanitangani Suliatsaup iningani ilautitsilauttuk oganniatuligijinnimik, imappisuak omajunginnik, ogagalait, ammalu timmianik.

GXT atugalasimajut suliaKatlutillu asinginni attutausagaisonik iniujunut taggâni asikkilautsimagatik, upvalu attuilugatik imappisuak omajunginnik, ammalu asikkilaungitut taipsumani 2013-nami Labradorimi suliaKaniammata. KajusiutiKagumavugut ilitsinik suliaKaKatiKagiamut, tigumialluta piujumik suliaKanginnagiamut ammalu piunitsautigasuallugit pivitsagijaujunut nunalinnut inunginnut.

Asigiallanik avatinnik apitsotitsaKagutsi upvalu uKagumagutsi taikkununga GXT-ikunut, uvattinik KaujititsigajakKusi Kagitaujatigut tugâgutinganut upvalu phonnilusi numaranut atânettunik.

PAIGIJAUGUTET AMMALU IKILLIUMITTITAUGIALET

GXT will apply a comprehensive set of precautions GXT atulangavut angijummagimmik kamatsiagiamut ammalu ikilliumittisigiamut sakKititsitailiniammata upvalu ikilliumittisiniammata attuigiamut oganik, omajunik ammalu avatinga ilonnâgut, taimâk pilaummigatta 2013-nami.

Ikilliumittisigiamut attuigajakKotunut ogannik, GXT-kut attunialungitut ailugatillu taijamut Hawke Ikâgiapvinganut iningata, attuilugatik oganniajunut, pannaigutiKallutik attuilugatik omajunik inigijauKattajunut nalliuvinni, oganik Kaujisalugatik, ammalu Kaujimattisinginnalutik /Kaujigatsanik tautseKatigeKattalutik oganik katingaKatigeKattajunut Kaujisalippata.

Ikimajut Nunatsiavut ammalu FFAW Oganniatuligijet SuliaKattinut nâlautiKanginnaniattut imappimiutinik atullutik KaujimaKatigenginnaniammata taikkut oganik iKalunniajunut umiaKajunut KanitanganegajakKotunut Kaujisalippata ikajusonguniammata nalunaittisigiamut ammalu apvilukaniangimata oganniatet piKutinginnik inigijaujunut, uKâlautiKallutik apomautiKagajappata, napvâKattalutik sittutitaugajattunut, ammalu sakKititsiKattalutik tasiugiajimmik taikkununga umiangujunut.

GXT, atullutik nunamettunik aulatsijinginnik ammalu ikimajunut kiggatuttinik, KaujimaKatiKanginnaniattut taikkununga oganniatuligijet katutjiKatigenginnut Kaujititsinginnaniammata pannaigutinginnik Kaujisagiamut piniannigijauKattaniattunut ammalu ikajugiamut piujumik KaujigatsaKanginnaniammata taikkununga oganniajunut ilauKatauKattajunut. Tamanna kajusitsialauttuk jâringani 2013-nami ammalu oganniatuligijet Kanutuinnak uKumaitsautiKalulaungitut upvalu apomautigijauluKagatik.

AtuniKatsiajut Kaujigatsait pitjutigillugu Kaujisannik nuititaulâmmijuk kinakkutuinnanut takujausongulluni suliatsangitigut Kaujititsilippata taikkununga Kaujigatsaligijiujunut, sollu Satjugiamik KinijattiuKattajunut Kaujigatsanginnut Umianut, CBC Naluatikkut Ogannianimmut pitjutiKaKattajunut ammalu OK nâlautingatigut, ammalu taikkununga tusagatsaligijiujunut akungani Kaujisajunut ammalu oganniajunut umianut atullutik imappimiutait nâlautinginnik imappimelippata. GXT-kut tigumiaKattamijut najuttiKatsiatlutillu Kagitaujatigut KaujititsiKattamijut sakKititsigiamut suliatsamut Kaujigatsanginnik aivigijausok (http://gxtspan.com).

SakKititsitailigiamut upvalu ikililumittisigiamut attuigajakKotunut imappimiutanik omajunik (piluattumik apvinik) GXT-kut malilangajut Allatausimajumik Canadami AtuKattajanginnik Ikilliumittisigiamut Ikkami Kaujisajunut nipanginnik Imappet Avatingani pivalliatausimajumit Oganniatuligijiujunut ammalu Imappisuami Canadami (DFO, 2004). Tânna ilonnanga allaKutik atuinnaujuk Kagitaujammi omani http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/seismic-sismique/statement-enonce-eng.asp.

Tânna allatausimajuk sakKititaulauttuk atuttaunginnaniammat ammalu taimailinganginnaniammat ikilliumittisigiamut pilukagajakKotunut atuttaujumillu Canadami ikkami Kaujisagiamut imappet avatinginni.

Asigiallait avatik paigijaugutinga atuttauKattajut ilautitsimijuk anitagatsanik asikkitailigiamut aulatsisiasongugiamut, sinannak/Kinnitak imammi anitsigiamut piusiKallutik, ikilliumittisigiamut ikkiamut sakkutauKattajunut, tuavittikut (asikkijunut) kamasagaisongugiamut pannaigutik, ammalu piusigijangita ammalu putoggigiamut, malitsiajunut KângiutiKajunullu Canadami ammalu Nunatsuami piusigijanginnut (sollu MARPOL).

GXT katimaKatiKanginnatuillu ilonnanginnut suliatsami suliaKattinginnik sivungani suliatsak pigiasikKâgani KaujimatsiaKullugit ammalu sulijugiKatsiaKullugit avatimmik ammalu atugialinginnik

Nakummek KanuttogutiKagavit

KaujititaugajakKugut apitsotiKaguvit, isumâlotiKaguvit upvalu Kaujigatsatâgiallagumaguvit pitjutigillugu suliatsamik.

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