

Environmental Assessment of GX Technology Canada Ltd's GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014 – 2018

GXT Responses to Consolidated Environmental Assessment Addendum Review Comments

7 July 2014

The following responds to the document "Environmental Assessment of GX Technology Canada Ltd.'s GrandSPAN Seismic, Gravity and Magnetic Survey, 2014 to 2018 Consolidated EA Addendum Review Comments" provided to GXT by the C-NLOPB on 4 July 2014.

As with GXT's original Responses to GXT GrandSPAN 2014-2018 EA Review Comments, the sections that follow reproduce each of the comments received by GXT, organized and numbered under the commenting organization name and then provides GXT's supplementary reply (GXT Addendum Response). This response document is ordered as follows:

- 1) Environment Canada – Canadian Wildlife Service (EC-CWS)
- 2) Canada – Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)
- 3) Fish, Food and Allied Workers|Unifor (FFAW|Unifor)

Environment Canada - Canadian Wildlife Service (EC-CWS)

EC-CWS Addendum Comment 1

The proponent should be reminded that results from the onboard seabird observation program should be sent to EC-CWS on an annual basis.

GXT Addendum Response: GXT so commits; EC-CWS will be sent both the formal project MMSO Report as well as the seabird observational data in digital form.

Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)

C-NLOPB Addendum Comment 1

Original comment: To say that two of the coordinates are Tribunal Points, and not provide what they are, is unacceptable. The reviewer can easily identify seven corner coordinates and suggests the following solution to clearly having the Project Area described. Start with one of the most northern points along 50° 20'N and move clockwise around the Project Area, i.e. Point 1 is 50° 20'N and 41° XX'W; Point 2 is 45° XX'N and 41° XX'W; all the way around until you identify the western point along the SPM maritime Boundary. Then you can verbally describe going around the boundary, describe that you follow the outer (seaward) boundary of Canada's Territorial Sea up to 50° 20'N and 54° XX'. This, or some derivative, is how it should be conveyed.

GXT Response: Project Area Coordinates: EA Report Figure 1.1, which is referenced in Section 2.4 of that document, does provide the coordinates (66° 54' 48.9"N, 59° 00' 34.9" W and 40° 58' 21.7" N 55° 34' 23.3" W) of the two referenced Tribunal coordinates as the "corner" points of GXT's Project Area along the NS – NL mineral resources boundary (the "offshore area", given legal force by SOR 2003/192) and as depicted on various C-NLOPB maps and charts (see http://www.cnlopb.nl.ca/land_maps.shtml). For complete reference, the full set of coordinates defined by the Tribunal can be found at <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-192/page-2.html#h-3>.

For its geographical description of the Project Area GXT chose to place the exact coordinates of the key points on a map (EA Report Figure 1.1) as it was thought to be more dispositive than a verbal description alone. However, as requested, the following is a verbal description of the Project Area boundaries, as requested by the C-NLOPB, starting at the most northerly point and proceeding clockwise:

Beginning at a point 50° 20' 00.0" N, 54° 35' 00.0" W, the northern Project Area boundary proceeds due east to point 50° 20' 00.0" N, 41° 45' 00.0" W; thence due south to point 45

° 30' 00.0" N, 41° 45' 00.0" W; thence in a southwesterly direction to point 40° 58' 21.7" N, 49° 00' 00.0" W; thence due west to point 40° 58' 21.7" N, 55° 34' 23.3" W (on the NS-NL "offshore area" boundary); thence in a generally northerly direction following the NS-NL offshore area boundary to point 46° 54' 48.9" N, 59° 00' 34.9" W; thence due east to the western limit of the EEZ defined for St Pierre et Miquelon (France); thence southerly and then northerly following the French EEZ as far north on the east side of the EEZ to meet the outer (seaward) boundary of Canada's Territorial Sea south of the Burin Peninsula. From thence (generally northeastwardly) the Project Area's landward limit is defined as the outer limit of Canada's Territorial Sea until it reaches the Project Area's beginning point at 50° 20' 00.0" N, 54° 35' 00.0" W.

C-NLOPB Response: Thank you for the verbal description, however the Tribunal point in Figure 1.1 is 46° 54' 48.9"N, 59° 00' 34.9" W not 66° 54' 48.9"N, 59° 00' 34.9" W.

GXT Addendum Response: The location 46° 54' 48.9"N, 59° 00' 34.9" W is the correct point. The reference to "66°" was a typographical error in GXT's Response.

Fish, Food and Allied Workers | Unifor

FFAW | Unifor Addendum Comment 1

Original Comment: There is a recurring mention within the Environmental Assessment about the utilization of a 7 day temporal pre-research survey separation. It is the understanding of the FFAW | Unifor that this is being accepted by DFO when it comes to their Spring and Fall Research Vessel Trawl Surveys, but it is not feasible to be utilized in connection with the execution of the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab. If there are further questions on these matters it would be worthwhile to communicate with the shell-fish research scientists at DFO. The reviewer would suggest that in the document when there is any mention of the 7 day temporal separation, it must specify what science context this applies. Any possible impact, be it negative or positive, on the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab cannot be accepted.

GXT Response: GXT's aim is to avoid any actual effects on fisheries-related science surveys, including the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab. This is why GXT has stated that it will avoid all known science operating / set locations by at least 30 km (i.e. a 30 km radius) for at least 7 days before surveying the locations. While the fisheries research is active, GXT will also maintain a 30 km closest point of approach (CPA) from the active gear. As presented and discussed in the EA (Sections 5.3.3 and 5.4.3 and associated Tables in particular), past studies from the available scientific literature that indicate any potential behavioural effects (e.g. on catch rates) also indicate that these are of a temporary and localized nature.

The 7-day separation period and 30 km distance has been applied for several seismic projects in recent years, each time reviewed by DFO in the relevant EAs, and accepted as appropriate through the regulatory screening process.

GXT personnel have been, and continue to be, in communication with DFO Shellfish Section personnel, and they are aware of the above mitigation commitments.

FFAW|Unifor Response: The 7 day temporal separation is not an acceptable mitigation for fisheries or fisheries science in the view of the FFAW|Unifor. In relation to the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab, the 7 day temporal separation is not an acceptable protocol. Furthermore, this perspective is shared by our scientific partners at Fisheries and Oceans Canada.

GXT Addendum Response: While we respect the reviewer's opinions and perspectives on this matter, we would reiterate that as presented and discussed in the EA Report, information from the available scientific literature indicates any potential behavioral effects on fish as a result of marine seismic surveys (and any subsequent implications for fish catch rates), are of a temporary and localized nature. GXT therefore remains strongly of the view that the proposed 7-day pre-survey separation period is an adequate and appropriate mitigative approach. As noted in GXT's original response, the 7-day separation period (and 30 km distance separation) has been reviewed by DFO in several other EAs, and has been accepted as appropriate for those projects through the regulatory screening process undertaken by the C-NLOPB. GXT respects and adheres to all conditions placed on its Project by the regulatory authority.

FFAW|Unifor Addendum Comment 2

Original Comment: The FFAW|Unifor does have great hesitation with the potential GrandSPAN Seismic Line Layout, as it covers an area of such magnitude with lines going over many of the major fishing grounds in Newfoundland and Labrador waters.

GXT Response: Although the overall Project Area is extensive, the wide spacing of the Span lines means that the survey is not intensive in any one area. The total maximum acquisition that could occur in any one year (14,000 km; see GrandSPAN EA Report Section 2.1) is similar to or less than the density (i.e. line km of acquisition per square km) of many other seismic surveys recently proposed for smaller areas (e.g. up to 19,000 km during 2014 for MKI/TGS-NOPEC's Southern Grand Banks program - see http://www.cnlopb.nl.ca/pdfs/mkisgbss/mkiea_p1.pdf).

As the GrandSPAN EA (Section 5.2.1) notes: "The layout of GXT's Basin Span surveys (see typical line pre-plots presented in Figure 2.1), with very long and widely spaced lines - typically several hundred kilometres long and 50 or more km apart except where they cross - means that in most areas (fishing grounds and wildlife habitat) there will be

only a one-time exposure to Project activities, unlike most 2D or 3D seismic surveys. With the seismic ship travelling at approximately 8.3 km / hour, for any given location, the survey will be tens of kilometres away within a few hours and will not return there, except for the crossing points which will likely be separated by several days or even weeks in timing.”

Information on and an analysis of fishing activity throughout the Project and Study Areas are provided in the EA Report, which also outlines GXT’s planned approaches and measures to avoid interactions with, and adverse effects upon, commercial fishing activity.

FFAW|Unifor Response: It is still incumbent upon the reviewer to reiterate that the lines are projected to cover many of the most important fishing grounds in Newfoundland and Labrador waters, some of which see harvesting activity in all 12 months of the year.

GXT Addendum Response: GXT does recognize that portions of several of its lines will pass through important fishing areas (as indicated for the Project Area as a whole in Figures 4.73 - 4.84 of the EA Report and associated text). The many mitigation measures described throughout the EA Report (and particularly in Section 5.2) further reflect this recognition and are intended to avoid adverse effects in these and all other fishing areas.

FFAW|Unifor Addendum Comment 3

Original Comment: There should be no interference or impact on active fisheries or fisheries science activities, see Appendix 2 of C-NLOPBs Geophysical, Geological, Environmental and Geotechnical Program Guidelines. Further, the FFAW|Unifor would suggest that communication with fishing vessels should go through the Fisheries Liaison Officer and not the support ship as per what is in the One Ocean Seismic Program Protocol and Fisheries Liaison Officer video developed by the Canadian Association of Petroleum Producers.

GXT Response: It is understood that the primary contact will be the FLO on the seismic ship. Situations where the scout / support ship would communicate with a fishing ship (or any other vessel) would occur if the support ship is scouting at some distance from the seismic ship and receives (or it makes sense to initiate) the initial hail; this is often necessary as a matter of safety. It is also possible that the support ship would not know it is a fishing vessel until the radio contact is made. GXT’s policy, in such a case, is for the scout ship to inform the fishing vessel of its identity, that there is a seismic ship at a specified location (providing identity and call sign), that there is a FLO on-board the seismic ship, and that further communications should be directed to him/her. This information and protocol is regularly included in GXT’s pre-survey start-up briefings with the ships’ crews.

FFAW|Unifor Response: The reviewer would suggest that part of the text in the Environmental Assessment could read “The support ship will have responsibilities in assisting the Fisheries Liaison Officer in communicating with fishing vessels”.

GXT Addendum Response: Agreed; that is GXT’s intention.

FFAW|Unifor Addendum Comment 4

Original Comment: discussion on page 76 about Snow Crab relies on the DFO RV Trawl Survey, although the Industry-DFO Collaborative Post Season Trap Survey for Snow Crab has been found to be more reliable when it comes to the estimation of abundance.

GXT Response: The use of the DFO RV Trawl surveys allows for consistency in methodology and presentation across species and greater overall spatial coverage of the analysis. Therefore, we respectfully prefer to retain and utilize the DFO RV Trawl survey information, similar to other EAs and SEAs in the NL Offshore Area (see http://www.cnlopb.nl.ca/env_project.shtml; http://www.cnlopb.nl.ca/env_strategic.shtml).

FFAW|Unifor Response: The FFAW|Unifor has to reiterate that the DFO RV Trawl survey is used secondary to the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab when it comes to the distribution and assessment of snow crab in Newfoundland and Labrador waters.

GXT Addendum Response: GXT does acknowledge the importance and value of the Industry-DFO Collaborative Post-Season Snow Crab Survey, especially for the assessment and management of snow crab in Newfoundland and Labrador waters. EA Report Section 4.3.1.3 (Industry and Government Research Vessel Surveys) describes this survey and provides (in Figure 4.101) the locations of all the survey core stations.

As explained in the original response (above), the primary reasons for using the DFO RV surveys for the purposes of the EA was to allow for methodological and presentational consistency (in the accompanying Figures) across species, and to use a source that most closely matched the full geographic extent of the EA Study and Project Areas.

In its original comment, the FFAW|Unifor reviewer stated that the “discussion on page 76 about Snow Crab relies on the DFO RV Trawl Survey”. This, however, is not the case as the description of snow crab in the EA Report utilizes several relevant sources, including a key DFO document (cited on page 76 of the EA Report) related to stock status and abundance (Mullowney et al 2012), which is based explicitly on data from both the Collaborative Post-Season survey data and the RV trawl data. The same is true for Mullowney et al (2013).

In terms of coverage, the DFO RV survey encompasses a larger area than the Industry-DFO Collaborative survey, an area which better matches the GXT GrandSPAN EA Study Area, and so is most appropriate for the required geographical scope of the GrandSPAN EA. As Mullowney et al (2013) notes, “The CPS [Collaborative Post-Season] trap survey is more spatially limited than the multi-species trawl surveys, as it targets only portions of commercial fishing grounds.” Specifically, the RV survey includes the areas within the GXT Study Area surveyed by the Collaborative Post-Season survey plus other areas not surveyed by the Collaborative effort, such as the full “tail” of the Grand Banks, which is part of GXT’s proposed Project Area. Insofar as the RV and the CPS surveys do overlap, the indications of important concentrations of snow crab are very similar. Compare, for example, EA Report Figure 4.18, based on the RV survey data, with Figures 2 - 7, in Stansbury et al (2012 and 2013), which are based on the CPS data; Figure 1 below reproduces EA Report Figure 4.18 and representative figures from Stansbury et al (2012).

For these reasons, we would also maintain that presenting additional, detailed snow crab survey information from the Industry-DFO crab surveys in the EA Report would not result in any change in the assessment and evaluation of potential environmental effects presented in the EA, or to the mitigation measures that GXT has proposed for the Project.

References:

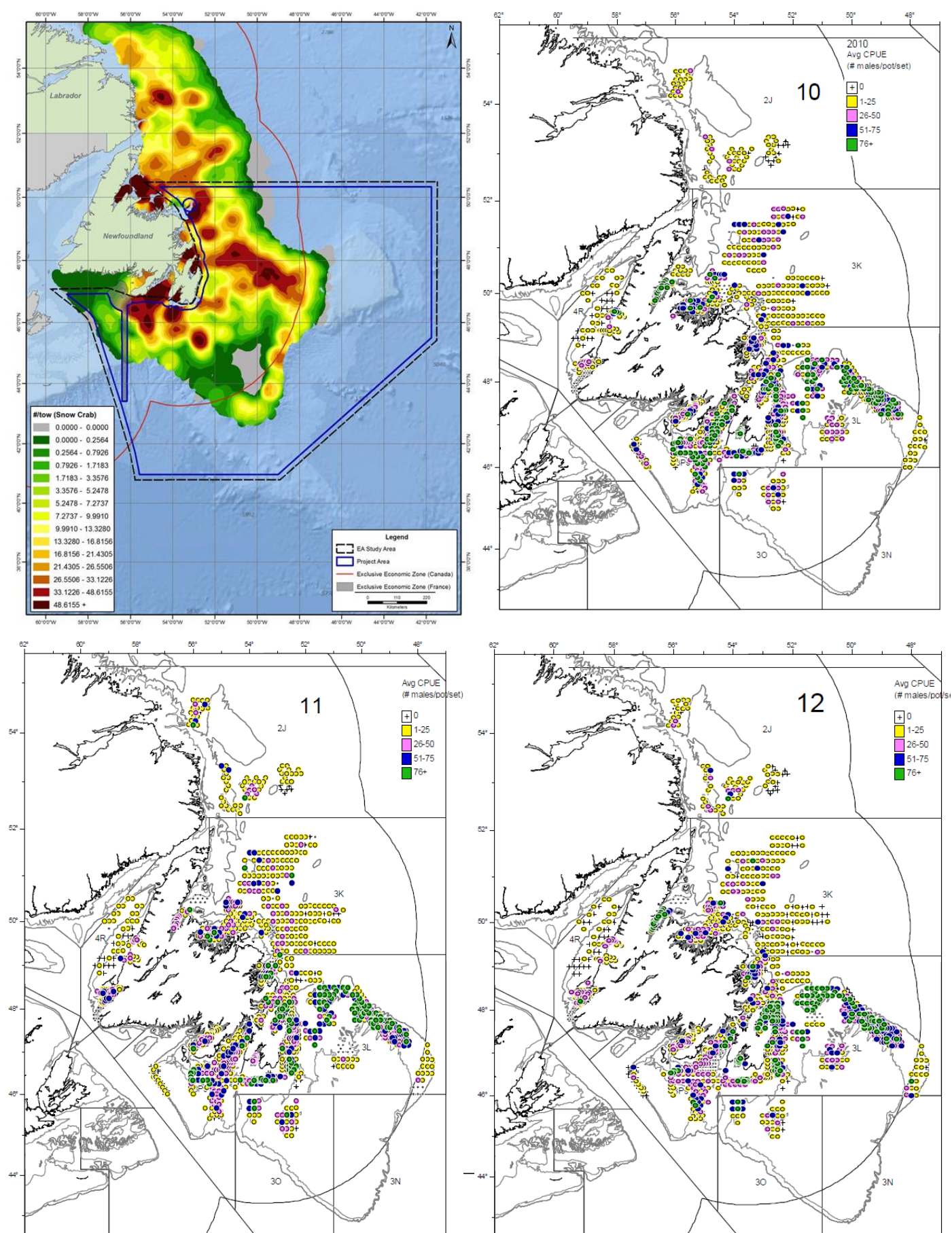
Mullowney, D., Dawe, E., Skanes, K., Hynick, E., Coffey, W., O’Keefe, P., Fiander, D., Stansbury, D., Colbourne, E., and Maddock-Parsons, D. (2012). An Assessment of Newfoundland and Labrador Snow Crab (*Chionoecetes opilio*) in 2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/045. iii + 178 p. <http://www.dfo-mpo.gc.ca/Library/347191.pdf>

Mullowney, D., Dawe, E., Skanes, K., Hynick, E., Coffey, W., O’Keefe, P., Fiander, D., Stansbury, D., Colbourne, E., and Maddock-Parsons, D. (2013). An assessment of Newfoundland and Labrador Snow Crab (*Chionoecetes opilio*) in 2011. DFO Canadian Science Advisory Secretariat Research Documents 2012/160. (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012_160-eng.html)

Stansbury, D.E., D. Fiander and D. Maddock Parsons (2012). Summary of the Industry-DFO Collaborative Post-season Trap Surveys for Snow Crab in Div. 2J3KLOPs4R. (2011 Post Season Snow Crab Survey) ([http://www.ffaw.nf.ca/?Content=2011 Post Season Snow Crab Survey](http://www.ffaw.nf.ca/?Content=2011%20Post%20Season%20Snow%20Crab%20Survey))

Stansbury, D.E., D. Fiander and D. Maddock Parsons (2013). Summary of the Industry-DFO Collaborative Post-season Trap Surveys for Snow Crab in Div. 2J3KLOPs4R. (2012 Post Season Snow Crab Survey) ([http://www.ffaw.nf.ca/?Content=2012 Post Season Snow Crab Survey](http://www.ffaw.nf.ca/?Content=2012%20Post%20Season%20Snow%20Crab%20Survey))

Figure 1. Comparison of Snow Crab Distribution based on RV Trawl Surveys and CPS Trap Surveys.
 Clockwise from top left: EA Figure 4.18; 2010 CPS results; 2011 CPS Results; 2012 CPS Results (Stansbury et al 2013)



FFAW|Unifor Addendum Comment 5

Original Comment: Harvesters and DFO scientists have strong evidence that we are already in a much warmer oceanographic regime, compared to the situation of the early 1990s. Further, when talking about future fisheries in the context of changing climatic circumstances, a discussion about the fisheries on the Ground Banks before 1990 would have been warranted.

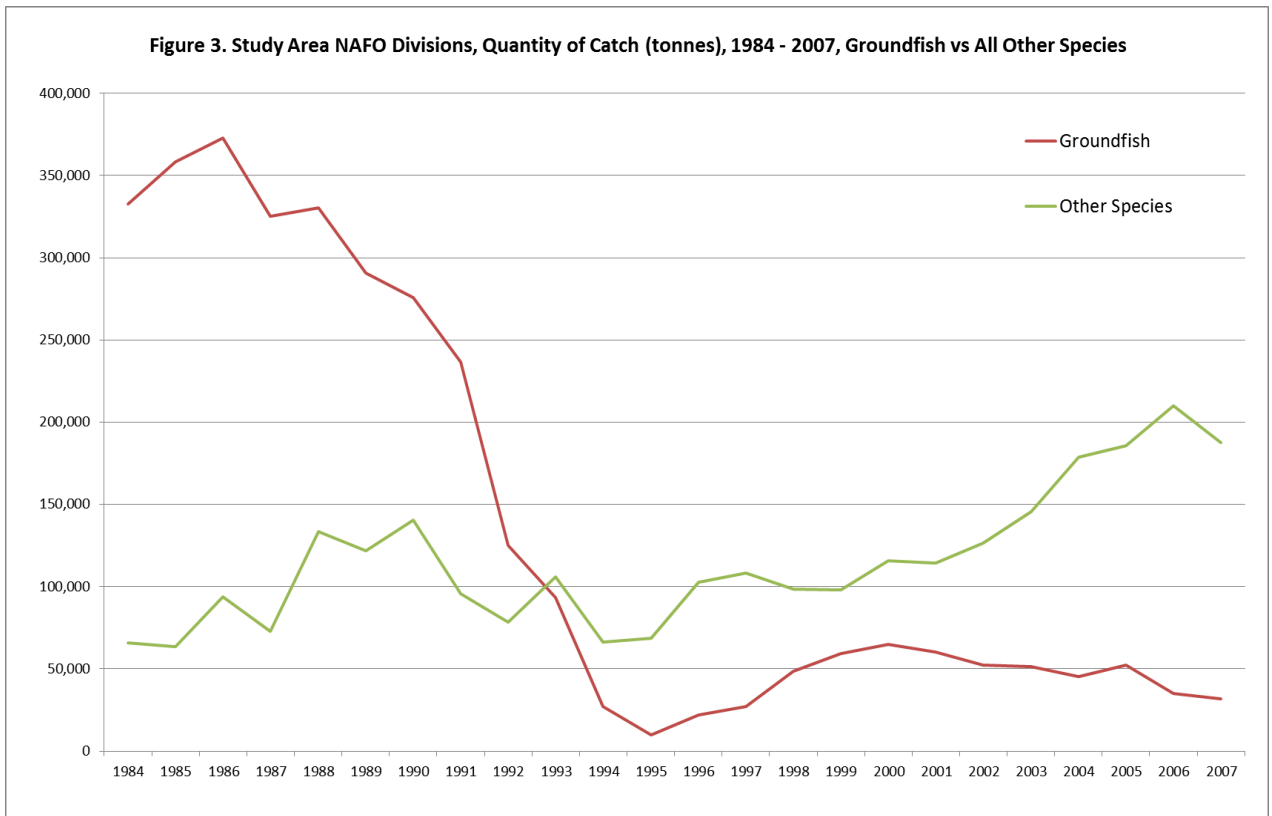
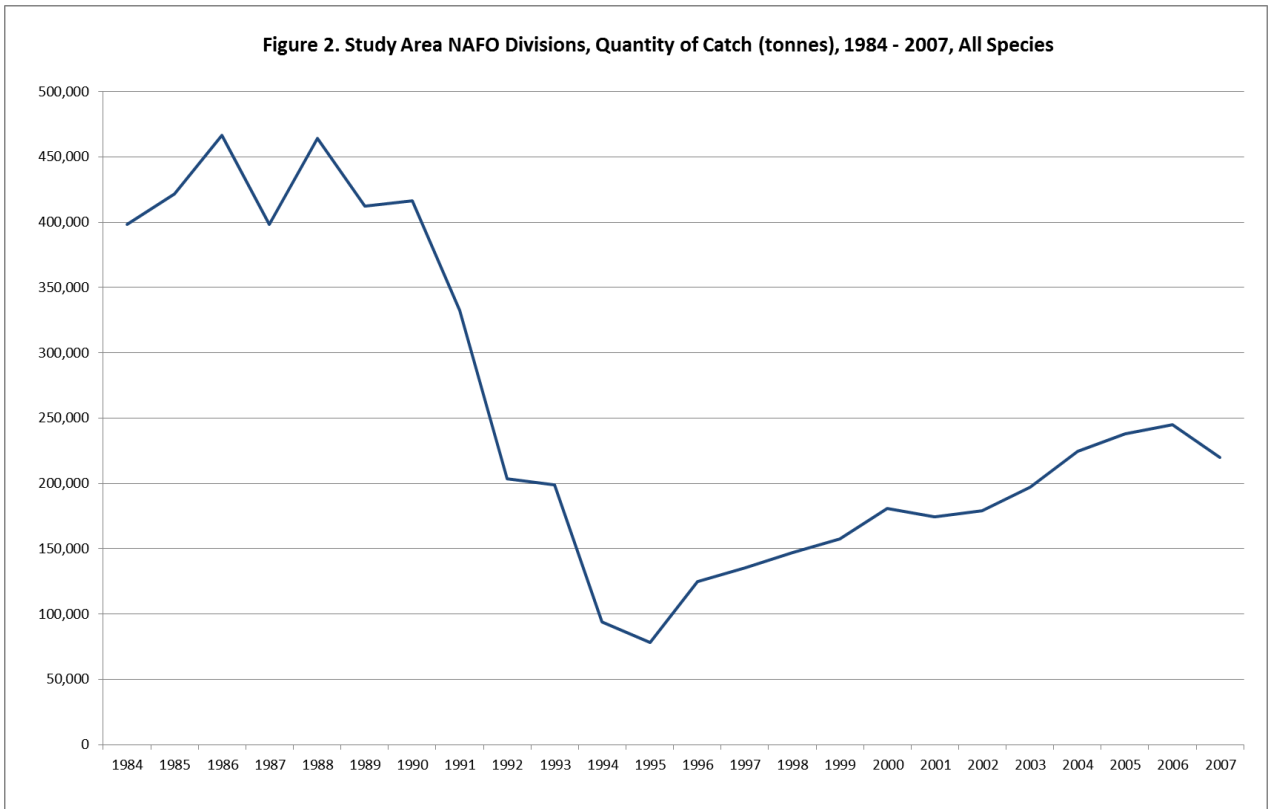
GXT Response: The environmental changes that have been observed due to changing oceanographic conditions in the Study Area are acknowledged and reflected throughout the discussion of marine fish and fish habitat (EA Report, Section 4.2.1). The referenced section entitled “Potential Future Commercial Fisheries” also references fishers’ statements and observations on this, and the possible implications for future fisheries in the region.

An overview of past (including pre-1990) fisheries in the Study Area is provided, as background and context to that discussion, at the beginning of Section 4.3.1.2 (in a subsection entitled “Overview of Past Fisheries”).

FFAW|Unifor Response: The FFAW|Unifor notes the token mention of fisheries pre-moratorium but would suggest that something more substantiated would be warranted in light of the environmental changes.

GXT Addendum Response: GXT’s previous response (above) indicates where and how each of these items were addressed in the original EA Report, as stated in the requirements of the C-NLOPB’s EA Scoping Document. That discussion recognizes the changing and dynamic nature of the commercial fishing industry in Newfoundland and Labrador, particularly since the initial moratorium in 1992, which heralded the dramatic shift from groundfish to shellfish.

To supplement the discussion provided in the EA Report, as the FFAW|Unifor requests, the following additional graphs (Figures 2 and 3, below) are provided. These provide an indication of the fish harvest by quantity (weight, in tonnes) from 1984 to 2007, since the main focus of the data analysis in the current fisheries described in the EA Report (Section 4.3.1.2) starts in 2008. They present summary information on the key Grand Banks / Study Area NAFO Divisions (i.e. Divisions 3K, 3L, 3M, 3N, 3O and 3P) landings, specifically: 1) Overall quantity of harvest from 1984 to 2007 (Figure 2); and 2) a comparison of the harvest of groundfish vs. other species (Figure 3). Both illustrate the nature and scale of the changes which occurred after 1991.



It should also be noted that the EA Report also describes "Potential Future Commercial Fisheries" (EA p. 249) to the degree that these can be assessed at this stage, as well as referencing fishers' statements and observations regarding potential future fisheries in the region. Most importantly, GXT has also committed that "If, however, the current situation changes and a new fishery, or a currently closed fishery, should become active within the Study Area during the temporal scope of this Project, this will be identified in the on-going fishery information updates and analysis (Section 5.2) and considered in the annual update that GXT will file before its application for a GPA in any Project year" (EA p. 249).

Again, the environmental changes that have been observed due to changing oceanographic conditions in the Study Area are acknowledged and reflected throughout the discussion of marine fish and fish habitat (EA Report, Section 4.2.1).

Note on data: The data used in Figures 2 and 3 are based DFO Newfoundland and Labrador Region and Maritimes Region catch and effort datasets, provided in digital form between 1984 and 2008. For this historical overview, quantities (which more are directly comparable from year to year) are presented rather than values, since value data reflect several factors other than resource availability or fishing effort. This is also because value differences often occur from year to year because of price fluctuations and other external market factors, including international exchange rates. Further, the values that were provided in the DFO datasets are in Current Dollars for each data year, while the Canadian Consumer Price Index (CPI) increased by 84% between 1984 and 2007 (see <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ46b-eng.htm>)

FFAW|Unifor Addendum Comment 6

Original Comment: FFAW|Unifor must indicate that what was proposed as a quiet time before the Industry- DFO Collaborative Post Season Trap Survey for Snow Crab in the Environmental Assessment for LabradorSPAN remains inappropriate for implementation.

GXT Response: Please see GXT's response to FFAW Comment 1.

FFAW|Unifor Response: Please see response to comment 1.

GXT Addendum Response: As indicated above, the comment and response are addressed in FFAW|Unifor Comment 1.

FFAW|Unifor Addendum Comment 7

Original comment: There has been no agreement as to any temporal separation plan between a Seismic Program and the Industry-DFO Collaborative Post Season Trap Survey for Snow Crab. FFAW|Unifor has been asking proponents to provide evidence of where suggested 7 day separations come from. All that has been coming back is that it was accepted in the past or that DFO accepts it for the RV Trawl Survey. It remains that the Industry-DFO Collaborative Post Season Trap Survey for Snow Crab involves the surveying of approximately 1,500 stations utilizing commercial harvesting vessels and commercial gear. As it stands it is untenable to do firm scheduling on this as the scientific licences are not issued until September and the harvesters participating cannot be active on a commercial and a scientific licence at the same time.

GXT Response: Please see GXT's response to FFAW Comment 1.

FFAW|Unifor Response: Please see response to comment 1.

GXT Addendum Response: As indicated above, the comment and response are addressed in FFAW|Unifor Comment 1.

FFAW|Unifor Addendum Comment 8

Original Comment: Harvesting activity and its impact on mortality and habitat is managed with the guiding principle being the precautionary approach. When it comes to introducing Seismic Programs on the fishing grounds it is only fair to expect that the same principle be followed with regards to the potential of impact on species abundance and/or behaviour.

GXT Response: The EA Report provides a detailed description of GXT's planned marine geophysical survey activities, the existing biophysical and socioeconomic environments of the Study Area, the substantial scientific literature that exists on potential effects on fish, and the potential effects of the Project on the fish, fish habitat and fisheries VECs, as well as of GXT's planned approaches and measures to avoid adverse effects upon the environment. Many of these measures represent proactive, planning approaches to avoiding possible adverse environmental interactions, including with fish, fish habitat and fisheries. GXT therefore submits that a precautionary approach has been a fundamental part of Project planning to date, and will continue to guide the Project throughout its implementation.

FFAW|Unifor Response: If precaution is such a fundamental part of Project planning and a guide to the Project throughout its implementation, avoidance of active fishing grounds and appreciation of the issues the fishing industry has with GX Technologies suggested approach re: Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab would be warranted.

GXT Addendum Response: The 7-day, 30-km avoidance and separation mitigation described in the EA (and as discussed in FFAW|Unifor Addendum Comment 1), as well as the other planning and communication mitigations that GXT has identified and committed to in the EA Report are intended and considered to be effective, appropriate and precautionary.

FFAW|Unifor Addendum Comment 9

Original Comment: Looking at Appendix 2 of C-NLOPB's Geophysical, Geological, Environmental and Geotechnical Program Guidelines it is clear that there should be no such interfering from seismic activity on fisheries or fisheries science.

GXT Response: Please see GXT's response to C-NLOPB Comment 26. GXT recognizes the directions in the C-NLOPB Guidelines and has committed to adhere to each of the mitigation measures outlined therein in planning and implementing the Project. In particular, as the Guidelines state concerning potential interference with fisheries (Appendix 2, Section 2.2):

- a) Surveys should be scheduled, to the extent possible, to reduce potential for impact or interference with Department of Fisheries and Oceans (DFO) science surveys. Spatial and temporal logistics should be determined with DFO to reduce overlap of seismic operations with research survey areas, and to allow an adequate temporal buffer between seismic survey operations and DFO research activities.
- b) Seismic activities should be scheduled to avoid heavily fished areas, to the extent possible. The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and local fishing interests are informed of each other's planned activities.

FFAW|Unifor Response: In the event that there is fishing gear in the proposed path of the seismic vessel, it is incumbent upon the seismic vessel to adjust its course to avoid interference with an active fishing environment.

GXT Addendum Response: Agreed; that is GXT's intent. The information provided during continuing industry communications (on shore and at sea), the FLO on the seismic ship and the support/scout vessel will all be used to support that objective.

FFAW|Unifor Addendum Comment 10

Original Comment: Again the 7 day temporal separation has likely only been discussed in a positive context for the DFO RV Trawl Surveys that take place. It is not viable to use temporal separation for the Industry-DFO Collaborative Post Season Trap Survey for Snow Crab.

GXT Response: Please see GXT's response to FFAW Comment 1.

FFAW|Unifor Response: Please see response to comment 1.

GXT Addendum Response: As indicated above, the comment and response are addressed in FFAW|Unifor Comment 1.