

**Environmental Assessment
of WesternGeco's
Eastern Newfoundland Offshore
Seismic Program, 2015-2024
Addendum**

Prepared by



For

**WesternGeco
(Division of Schlumberger Canada Limited)**

**28 January 2016
LGL Project No. FA0035**

**Environmental Assessment
of WesternGeco's
Eastern Newfoundland Offshore
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Addendum**

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GENERAL COMMENTS

Environment Canada

General Comment: EC's previous comments on the scoping document and project description (submitted to you on 19 February 2015) are still applicable to the project as described in the EA report.

Response: As per the "previous comments" noted, the regulatory requirements outlined in the *Fisheries Act*, *Migratory Birds Convention Act*, *Species at Risk Act* and *Canadian Environmental Protection Act* were consulted when preparing this EA (see Section 1.1 of the EA for the full list of legislation and regulatory approval documents relevant to the environmental aspects of the Project).

FFAW/Unifor

General Comment: At our initial consultation meeting with WesternGeco in January 2015 we advised the company that fish harvesters are interested in being more engaged and directly involved in the consultation process for project-specific Environmental Assessments. This EA covers a large project area that could affect several fishing fleets in different areas over a long time period. Therefore we suggested several locations for meetings to provide access for the harvesters to attend. Concerns related to seismic impacts on commercial harvesting have been documented. However, providing information about project specifics directly to those actively fishing in an area would seem a reasonable mitigation measure to create awareness and prevent conflict on the water. However, the company did not seem to think additional meetings were necessary. They cited short time frames and tight timelines and the necessity to meet with harvesters in person at various locations as not being warranted as they planned to focus only on the Flemish Pass area in 2015.

Overall the document is very non-specific in terms of the actual project that is planned over a ten-year period. As such it is challenging to comment on how the work will impact commercial fishing and/or the environment in this ten-year period.

It remains of utmost importance that the proponent diligently pursues the consultation process with all other ocean users. This is especially of importance as this program may have vessels operating within active harvesting areas throughout the ten year period. The Petroleum Industry Liaison with FFAW-Unifor is available to assist in arranging consultation sessions specifically aimed at those active within the fishing industry.

Response: WesternGeco conducted its initial face-to-face consultation meeting with the FFAW/Unifor on 29 January, 2015. As indicated in the FFAW/Unifor general comment, the idea of conducting more face-to-face consultation meetings with harvesters was raised during discussion. At no time did the WesternGeco representative indicate that additional meetings were unnecessary. Rather, it was requested that the FFAW/Unifor provide WesternGeco recommended locations for additional face-to-face consultation meetings with harvesters. Table 1 provides a timeline showing the efforts of WesternGeco to come to an agreement with the FFAW/Unifor on additional face-to-face consultation meetings.

Table 1. Timeline of Communication between WesternGeco and the FFAW/Unifor regarding Additional Face to-Face Consultation Meetings with Harvesters.

Date	Description
January 29, 2015	The initial face-to-face consultation meeting with the FFAW/Unifor was held. During this meeting, the FFAW/Unifor suggested that additional face-to-face consultation meetings with harvesters be held at other locations in Newfoundland. WesternGeco asked the FFAW/Unifor to suggest some locations for these additional meetings. The FFAW/Unifor indicated that there would be meetings with inshore harvester representatives on the Inshore Council around mid-February, after which WesternGeco would be given some suggested locations for additional face-to-face meetings with harvesters.
February 6, 2015	Email sent to FFAW requesting suggestions for locations of additional consultations. Email response from the FFAW/Unifor suggesting that WesternGeco conduct additional face-to-face meetings with harvesters at six locations in Newfoundland; St. Anthony, Fogo, Gander, Blaketown, Marystown and Placentia.
February 6 – March 1, 2015	Various discussions between WesternGeco and the FFAW/Unifor regarding options and requirements for so many additional meetings. WesternGeco also had discussions about this issue with the C-NLOPB and One Ocean during this period.
March 2, 2015	WesternGeco emailed the FFAW/Unifor with the suggestion that the number of additional meetings be reduced to two, and the offer to incur the cost of travel and incidentals for any harvester wanting to attend either of the two additional meetings.
March 9, 2015	The FFAW/Unifor responded to WesternGeco by email and indicated that if WesternGeco were willing to incur costs of harvester participants, then it might be possible to have only one additional meeting. However, the FFAW/Unifor also indicated that arranging a time for this meeting was an issue given that the PIL would be out of the office.
March 17, 2015	The FFAW/Unifor requested an update on WesternGeco’s 2015 plans to present to the FFAW/Unifor executive.
Late March/early April 2015	WesternGeco’s 2015 scope of work shifted from 3D surveying in Eastern NL to 2D surveying in SE NL.
April 9, 2015	WesternGeco emailed the FFAW/Unifor outlining its newly proposed 2D survey area for 2015, and requesting assistance with additional consultation meetings based on the new scope of work for 2015.
April 28, 2015	The FFAW/Unifor sent an email to WesternGeco that stated the following: “ <i>We have been very busy as this is the time of year with fisheries commencing. We are hoping to be able to facilitate the consultations in an appropriate manner all the same. Do you have an estimate when you will have initial submission of the EA’s?</i> ”
May 3, 2015	WesternGeco emailed the C-NLOPB requesting guidance on submitting the EA prior to completion of consultations.
May 6, 2016	The C-NLOPB replied to WesternGeco with the advice to submit the EA with text indicating that consultations were ongoing.
May 8, 2015	EA submitted to the C-NLOPB.
July 8, 2015	WesternGeco received consolidated EA reviewer comments from the C-NLOPB. By this point of the year, WesternGeco realized that it would not be working in the NL offshore in 2015, and that additional consultations with harvesters were not feasible during the summer months.
October 7, 2015	WesternGeco sent an email to the FFAW/Unifor requesting assistance with additional consultations. The email included an offer to conduct additional meetings at other locations in Newfoundland.

Date	Description
October 9, 2015	The FFAW/Unifor replied via email indicating that internal discussion would be held after which WesternGeco would be contacted.
November 9, 2015	WesternGeco has not heard back from the FFAW/Unifor since October 9. WesternGeco sent another email and phoned the FFAW/Unifor in an attempt to make contact.
November 19, 2015	WesternGeco has not heard back from the FFAW/Unifor since October 9. WesternGeco sent another email and phoned the FFAW/Unifor in an attempt to make contact.
December 3, 2015	WesternGeco has not heard back from the FFAW/Unifor since October 9. WesternGeco sent another email and phoned the FFAW/Unifor in an attempt to make contact. The FFAW/Unifor replied via email, apologizing for the delay in response and expressing concern about being able to organize additional meetings in December. The FFAW/Unifor offered WesternGeco the opportunity to present Project information at the 3L Fleet Meeting in St. John's on December 15. WesternGeco accepted the offer to make a 15 minute presentation.
December 4, 2015	The FFAW/Unifor emailed WesternGeco and confirmed that WesternGeco could have 15 minutes at the 3L Fleet Meeting to present Project information.
December 9, 2015	The FFAW/Unifor emailed WesternGeco and asked if WesternGeco could present Project information at the 3K Fleet Meeting in Grand Falls-Windsor on December 14. WesternGeco agreed to attend the meeting in Grand Falls-Windsor.
December 14, 2015	The WesternGeco representative presented at the 3K Fleet Meeting in Grand Falls-Windsor.
December 15, 2015	The WesternGeco representative presented at the 3L Fleet Meeting in St. John's.
December 22, 2015	WesternGeco provided the presentation given at the 3K and 3L Fleet Meetings to OCI and offered to meet with them, either in person or by teleconference.
January 4, 2016	WesternGeco provided the presentation given at the 3K and 3L Fleet Meetings to Maureen Murphy of One Ocean, and offered further discussion, if necessary.

FFAW/Unifor general comment on WesternGeco response: Consultation remains paramount to if seismic and fish harvesting are to harmoniously exist. As the project covers a large project area for a ten year period, probability is high that there will be seismic vessels operating within active harvesting areas throughout this time. The Petroleum Industry Liaison with FFAW-Unifor is available to aide in further consultation with the fishing industry as required.

WesternGeco response to FFAW/Unifor general comment on original response by WesternGeco: WesternGeco is in full agreement that consultation remains paramount if seismic and fish harvesting are to harmoniously exist. WesternGeco is appreciative of the fact that the PIL with FFAW/Unifor is available to aide in further consultation with the fishing industry.

SPECIFIC COMMENTS

Canada – Newfoundland and Labrador Offshore Petroleum Board

Sections 1.0 & 1.1, pgs 1&2 – The *Canada-Newfoundland Atlantic Accord Implementation Act* should be properly cited as *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*.

Response: Revise both instances of “*Canada-Newfoundland Atlantic Accord Implementation Act*” on the aforementioned pages to “*Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*”.

Section 2.1 Spatial and Temporal Boundaries, pg 5 – The “corner” coordinates of the extent of the Study Area

should be provided.

Response: The following coordinates (decimal degrees, WGS84 projection) define the “corner” coordinates of the extent of the Study Area:

- Northwest: 53.149°N, 51.745°W;
- Northeast: 52.535°N, 39.962°W;
- Southwest: 46.043°N, 51.710°W; and
- Southeast: 45.689°N, 41.406°W.

Section 2.2.8 Seismic Streamers, pg 8 – Although the length of the streamer for the 2015 2D program has been identified as 8,000-12,000 m in length, the maximum length of streamers for the 2016 to 2024 programs must be provided and included in the assessment of activities.

Response: During the 2016-2024 program, the maximum length of streamer that will be used for 2D surveying is 12,000 m, and the maximum length of streamer that will be used for 3D surveying is 10,000 m.

Section 2.3 Mitigation and Monitoring, pg 9 – Section I of Appendix 2 of the “*Geophysical, Geological, Environmental and Geotechnical Program Guidelines*” (C-NLOPB 2012) contains verbatim the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment* (C-NLOPB 2012). Appendix 2 contains **all** recommended environmental planning, mitigation and reporting measures for marine seismic surveys in the NL offshore area.

Response: Replace the first sentence of Section 2.3 with the following text: “Project mitigations detailed in the EA follow the recommended environmental planning, mitigation and reporting measures for marine seismic surveys in the NL offshore area in Appendix 2 of the “*Geophysical, Geological, Environmental and Geotechnical Program Guidelines*” (C-NLOPB 2012).”

Section 5.1.1.2 Program Consultations, 1st para., pg 144 – The results of the ongoing consultations with fishers and the FFAW must be provided.

Response: The response to the FFAW/Unifor general comment on page 1 is also applicable to this comment.

Section 5.5.2.2 Fisheries Liaison Officers (FLOs), pg 155, first bullet – Section 4.6, FLO Operational Responsibilities, Protocols and Communications *in* One Ocean 2013 makes no reference to the FLO being on a support vessel, only the seismic vessel. Please correct.

Response: Revise the first bullet point in Section 5.5.2.2 from “while stationed on the seismic vessel and support vessel, observe activities which may affect the fishing industry and petroleum operations;” to “while stationed on the seismic vessel, observe activities which may affect the fishing industry and petroleum operations;”. As per the first paragraph in Section 5.5.2.2 of the EA, WesternGeco commits to placing a FLO on board the seismic ship.

Section 5.7.4.1 Underwater Sound, Behavioural Effects, Invertebrate Fisheries, Second paragraph, pg 178 – Anecdotal information requires multiple observations (in these cases it would require multiple fish harvesters observing the same events). If it is only a single report from a fish harvester, which it appears to be, then the “anecdotal” needs to be removed and the observation by each fish harvester needs to be properly described as a single observation.

Response: Revise the aforementioned paragraph from:

“Andriquetto-Filho et al. (2005) attempted to evaluate the impact of seismic survey sound on artisanal shrimp fisheries off Brazil. Bottom trawl yields were measured before and after multiple-day shooting of an airgun array. Water depth in the experimental area ranged between 2 and 15 m. Results of the study did not indicate any significant deleterious impact on shrimp catches. Anecdotal information from Newfoundland indicated that catch rates of snow crabs showed a significant reduction immediately following a pass by a seismic survey vessel (G. Chidley, Newfoundland fisherman, pers. comm.). Additional anecdotal information from Newfoundland indicated that an aggregation of shrimp observed with a fishing vessel sounder appeared to shift downwards and away from a nearby seismic airgun sound source (H. Thorne, Newfoundland fisherman, pers. comm.). This observed effect was temporary.”

to:

“Andriquetto-Filho et al. (2005) attempted to evaluate the impact of seismic survey sound on artisanal shrimp fisheries off Brazil. Bottom trawl yields were measured before and after multiple-day shooting of an airgun array. Water depth in the experimental area ranged between 2 and 15 m. Results of the study did not indicate any significant deleterious impact on shrimp catches. Individual observations from Newfoundland fishers indicated that catch rates of snow crabs showed a significant reduction immediately following a pass by a seismic survey vessel (G. Chidley, Newfoundland fisherman, pers. comm.), and that an aggregation of shrimp observed with a fishing vessel sounder appeared to temporarily shift downwards and away from a nearby seismic airgun sound source (H. Thorne, Newfoundland fisherman, pers. comm.).”

Environment Canada

Section 5.5.5.6 Seabird Strandings and Section 5.7.6.2 Vessel Lights – Quote: “Any seabirds (most likely Leach’s Storm-Petrel) that become stranded on the vessels will be released using the mitigation methods consistent with The Leach’s Storm-Petrel: General Information and Handling Instructions by U. Williams (Petro-Canada) and J. Chardine (CWS) (n.d).”

A new draft document for handling stranded birds is now available that replaces the above Williams and Chardine protocol, and is attached below. The document is entitled "Best practices for standard birds encountered offshore - Atlantic Canada", and is dated April 2015. The document is still in development and a final version will be provided when available.

Response: Noted.

Fisheries and Oceans Canada (DFO)

Section 4.3.1 (Fisheries) Information Sources, pg 57-58 – Since the proposed seismic program is planned to continue into 2024 and the Environmental Assessment (EA) report utilizes catch and effort data up to 2013, it would be prudent to periodically revisit the potential impacts on commercial fisheries if fishing activity or the planned seismic activities vary significantly from that described in this EA report.

Response: WesternGeco commits to annual EA Updates throughout its 2015–2024 Seismic Program, utilizing the latest available commercial fisheries catch and effort data.

Section 4.3.4 Traditional and Aboriginal Fisheries, pg 87-88 – The first two sentences in this section should be clarified noting the following:

- The Qalipu First Nation Band holds communal commercial fishing licences for Snow Crab and Groundfish with allocations within NAFO Division 3K and a Shrimp licence for Shrimp Fishing Area (SFA) 06 (i.e., 3K and a portion of 2J); and
- The Innu Nation of Labrador holds a communal commercial fishing licence that permits fixed gear groundfish fishing activity within NAFO Divisions 2GH, 2J and 3LMNO and access to Shrimp in SFA06 (i.e., 3K and a portion of 2J) and SFA07 (i.e., 3L) using mobile gear.

Response: Revise Section 4.3.4 from:

“According to the Eastern Newfoundland SEA (C-NLOPB 2014), there are no known Aboriginal fisheries that occur within the Study Area. While the Nunatsiavut Government does hold a Communal Snow Crab licence and allocation within NAFO Divisions 2GHJ, the allocated region is north of 54°40’ N, which is north of the Study Area (DFO 2010b).”

to:

“Several Communal Commercial Fishing Licences (CCFLs) are held by Aboriginal groups for NAFO Divisions throughout the Study Area. The Qalipu First Nation Band holds CCFLs for snow crab and groundfish with allocations within Division 3K, and for shrimp in Shrimp Fishing Area (SFA) 06 (i.e., 3K and a portion of 2J). The Innu Nation of Labrador holds a CCFL permitting groundfish fishing activity within 2J and 3LM, and access to shrimp in SFA06 and SFA07 (i.e., 3L) using mobile gear (D. Ball, DFO, pers. comm. 2015; D. Tobin, DFO, pers. comm. 2015).

The Innu Nation of Labrador groundfish CCFL also permits activity within Divisions 2GH and 3NO (D. Ball, DFO, pers. comm. 2015; D. Tobin, DFO, pers. comm. 2015), north and south of the Study Area, respectively. While the Nunatsiavut Government does hold a Communal Snow Crab licence and allocation within Divisions 2GJ, the allocated region is north of 54°40’ N (DFO 2010b), which is north of the Study Area. Otherwise, there are no other known Aboriginal fisheries that occur within the Study Area, according to the Eastern Newfoundland SEA (C-NLOPB 2014).”

Section 4.6 Species at Risk - Table 4.17, pgs 131 and 132 –

The row for Harbour Porpoise (NW Atlantic population) listed as Threatened on Schedule 3 should be removed from the Table. It should be noted that Schedule 1 is the official list of *Species at Risk Act (SARA)* species, Schedules 2 and 3 were created to identify species that were remaining to be reassessed by COSEWIC using revised criteria when *SARA* came into effect.

Response: Remove the row for Harbour Porpoise (NW Atlantic population) from Table 4.17.

Similarly the rows showing Humpback Whale (Western North Atlantic population), and Atlantic Cod both listed as Special Concern on Schedule 3 should also be removed for the same reason stated above.

Response: Remove the rows for Humpback Whale (Western North Atlantic population) and Atlantic Cod from Table 4.17.

The population name of Leatherback Sea Turtle – i.e. Atlantic population – should be included in the applicable row of Table 4.17.

Response: The *SARA* and COSEWIC status designations are conflicting on the *SARA* website for this species, in that the leatherback sea turtle entry without any specific population (but with population ranges inclusive of the Atlantic or Pacific Ocean) is designated as Schedule 1 “endangered” by *SARA* but “non-active” by COSEWIC, whereas both the Atlantic and Pacific populations entries of this species are listed as having “no status” on any *SARA* Schedule but as “endangered” by COSEWIC. In light of the known highly sensitive nature of leatherback sea turtles that may occur within the Study Area, no population was listed in Table 4.17 for this species in order to remain consistent with the Species at Risk Public Registry entry which included the Schedule 1 “endangered” *SARA* status.

DFO comment on WesternGeco response: With respect to our comment vis a vis Leatherback Sea Turtle population being reflected within Table 4.17, the proponent’s response to our comment is accurate and acceptable. While not requiring any further revision the proponent should note that the information on the *SARA* and COSEWIC websites / listings is likely to be amended in the near future to update and include population names for Leatherback Sea Turtle. As such annual project EA updates should bear this in mind and reflect any subsequent changes accordingly.

WesternGeco response to DFO comment on original response by WesternGeco: WesternGeco will monitor the *SARA* and COSEWIC websites and include any necessary changes in species/population status under *SARA* and COSEWIC in its annual EA Update documents.

The correct population name of White Hake is Atlantic and Northern Gulf of St. Lawrence population. Table 4.17 should acknowledge and include same.

Response: Revise the population name under the Common Name entry for white hake from “Atlantic population” to “Atlantic and Northern Gulf of St. Lawrence population”.

Smooth Skate – Funk Island Deeps population – has been assessed by COSEWIC as Threatened, Table 4.17 should be amended to add this information.

Response: As of 5 January 2016, the Funk Island Deep population of smooth skate is assessed by COSEWIC as Endangered, rather than Threatened as in the above comment. Therefore, add the following row to Table 4.17, above the row for American Eel:

SPECIES		SARA			COSEWIC		
Common Name	Scientific Name	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern
Smooth Skate (Funk Island Deep population)	<i>Malacoraja senta</i>				X		

Section 4.7.1.1 PB-GB LOMA, pg 141 –

The 3rd sentence in this section reads “...DFO Newfoundland and Labrador Region has identified 11 EBSAs within the PB-GB LOMA as potential Areas of Interest (AOIs) for Marine Protected Area (MPA) designation, two of which occur entirely within the Study Area; the Northeast Shelf and Slope EBSA and the Virgin Rocks EBSA (see Figure 4.47).” This is not correct, the 11 identified EBSA’s, including the two within the Study area, are not potential Areas of Interest (AOI) for MPA designation. This sentence should be amended and clarified accordingly noting the following:

“DFO Newfoundland and Labrador Region has identified 11 EBSAs within the PB-GB LOMA, two of which occur entirely within the Study Area; the Northeast Shelf and Slope EBSA and the Virgin Rocks EBSA (see Figure 4.47). EBSAs should receive a greater than-usual degree of risk aversion in management of activities in order to protect overall ecosystem structure and function within the LOMA. Potential AOIs for Marine Protected Area (MPA) designation are identified in consultation with provincial and territorial governments, other federal agencies, non-governmental organizations, Aboriginal people and stakeholders via Integrated Management and/or advisory bodies associated with governing activities within the LOMA.”

Response: Noted. Revise the sentence referred to in the above comment to the following, as per the recommended amendment above:

“DFO Newfoundland and Labrador Region has identified 11 EBSAs within the PB-GB LOMA, two of which occur entirely within the Study Area; the Northeast Shelf and Slope EBSA and the Virgin Rocks EBSA (see Figure 4.47). EBSAs should receive a greater than-usual degree of risk aversion in management of activities in order to protect overall ecosystem structure and function within the LOMA. Potential Areas of Interest (AOIs) for Marine Protected Area (MPA) designation are identified in consultation with provincial and territorial governments, other federal agencies, non-governmental organizations, Aboriginal people and stakeholders via Integrated Management and/or advisory bodies associated with governing activities within the LOMA.”

Section 5.5 Mitigation Measures, pg 153 – It should be noted (most likely within this Section of the EA report) that the Marine Mammal Regulations (MMR) under the *Fisheries Act* is currently undergoing amendment. While public consultation on proposed amendments have only just recently ended it should be noted that Schedule 11 of the proposed amended MMR provide approach distances for marine mammals based on species, vehicle (vessel, aircraft, etc.), area and timing. Given that the proposed seismic survey(s) are likely to be scheduled to continue

into 2024 it is recommended that the proponent be aware of any potential implications that may arise if any proposed amendments to MMR are accepted during the timeframe covered by the proposed survey program.

Response: Noted. Future EA Updates will consider any potential implications that may arise if the aforementioned proposed amendments to MMR are accepted during the 2015–2024 temporal scope of the Project.

Section 5.5.5.1 Use of a Safety Zone, pg 160 – This section notes that “...the circular safety zone will be monitored by MMOs for the presence of marine mammals and sea turtles while the array is operating during daylight hours...” It is understood that the proposed seismic operations will occur during both hours of daylight and darkness. It is not clear what measures will be employed to provide monitoring of the safety zone for marine mammals and sea turtles during darkness and/or low visibility conditions.

Response: The chief mitigation measure employed for seismic operations during periods of darkness and/or low visibility conditions is the ramp-up/soft start protocol for the seismic array (see Section 5.5.5.3 of the EA for a description of ramp-up procedures). Section 11 (Operations in Low Visibility – Mitigation Measures) of the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* (2007) specifies the use of cetacean detection technology (e.g., Passive Acoustic Monitoring) prior to ramp-up if the full extent of the safety zone is not visible and the seismic array is in an area that has been identified as critical habitat for a vocalizing cetacean listed as endangered or threatened on Schedule 1 of SARA or where vocalizing cetaceans for which there could be significant adverse effects – as identified through an EA process – are expected to be present. However, cetacean detection technology will not be required for WesternGeco’s 2015–2024 Seismic Program, as no critical habitat was identified within the Study Area (see Section 5.7.8 and Table 5.2 of the EA) and no significant adverse effects were identified for marine mammals or sea turtles (see Section 5.7.7 and Table 5.1.4 of the EA).

Section 5.5.5.8 Reporting, pg 162 – This section notes that monitoring reports are submitted to C-NLOPB subsequent to completion of each seismic survey. While no amendment or change in the section is required it is suggested / requested that such reports be forwarded to DFO as an information item.

Response: WesternGeco commits to provide DFO the end-of-survey monitoring report and any reports pertaining to marine mammal, sea turtle or bird injury, death or oiling in association with the Project.

FFAW/Unifor

Section 4.2.2.1 Macro-invertebrate and Fish Species Harvested during Commercial Fisheries, pg 51 – COSEWIC reference stating no recovery of either abundance or age structure of offshore cod has been observed since the moratoria is contradictory to the most recent DFO stock status update for 2J3KL cod.

Response: Revise the following portion of the second paragraph, page 51, Section 4.2.2.1, Snow Crab subsection, from:

“According to COSEWIC (2010a), cod abundance in the inshore and offshore waters of Labrador and northeastern Newfoundland have declined by 97-99% since the 1960s and are currently at

historical lows. Virtually no recovery of either abundance or age structure of offshore cod has been observed since the moratoria were imposed in the early 1990s and threats to persistence include fishing, predation by fish and seals, and natural and fishing-induced ecosystem changes.”

to:

“According to COSEWIC (2010a), cod abundance in the inshore and offshore waters of Labrador and northeastern Newfoundland have declined by 97-99% since the 1960s and are currently at historical lows, particularly around the time of the declaration of the moratoria in the early 1990s. Until recently, there was virtually no recovery of either abundance or age structure of offshore cod. However, improvements have been observed since the late 2000s, with the offshore biomass of cod in NAFO Divisions 2J3KL increasing during 2003–2008 and 2012–2014, and the shoreward seasonal migration pattern that was observed prior to the moratoria occurring once again during recent years (DFO 2013i, 2015). The majority of the abundance and biomass is located in the northern portions of the stock area, in Divisions 2J and 3K (DFO 2015). Similarly, with relatively high recruitment levels since the mid-2000s, the cod stock on the Flemish Cap in Division 3M are currently in a healthy state, and is projected to be able to support an increase in catches in 2016 and 2017 (NAFO 2015a,b). However, despite a healthy prediction for Division 3M, fishing bans remain in place in 2016 for cod in Divisions 3LNO (NAFO 2015a). Threats to persistence include fishing, predation by fish and seals, and natural and fishing-induced ecosystem changes (COSEWIC 2010a).”

Section 5.5 Mitigation Measures, pg 153 – Advice received during consultations on additional meetings with harvesters prior to the project beginning was not taken.

Response: The response to the FFAW/Unifor general comment on page 1 is also applicable to this comment.

Section 5.5.3.3 Avoidance of Fisheries Science Surveys, pg 159 – The spatial-temporal avoidance protocol referenced for the post-season crab survey report is not acceptable to FFAW-Unifor. Seismic work should not be conducted in the vicinity of fixed stations of the post-season crab survey until they have been completed.

Response: WesternGeco commits to maintain regular communication with DFO, FFAW/Unifor, independent fishers and managers of other key corporate fisheries in the area involved with the DFO Research Vessel (RV) surveys and the Industry-DFO Collaborative Post-Season Trap Surveys for snow crab throughout survey operations. Seismic surveys will be scheduled, to the extent possible, to reduce potential impact or interference with science surveys or fishing activities.

The DFO RV multi-species survey avoidance measures presented in Section 5.5.3.3 of the EA (i.e., 7-day temporal buffer and 16 nm spatial buffer) should be appropriate for the post-season crab survey, especially considering that many finfish species can detect both the sound pressure and particle motion components of underwater sound while marine invertebrates seem to be sensitive to particle motion only. The avoidance measures indicated above have been included in all recently prepared seismic EAs approved by the C-NLOPB.

FFAW/Unifor comment on WesternGeco response: The 7 day temporal buffer 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. It is our stance that seismic work should **NOT** be conducted in the vicinity of survey stations.

WesternGeco response to FFAW/Unifor comment on original response by WesternGeco:

WesternGeco acknowledges that the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab is considered to be part of active fishing grounds until surveyed. Fisheries and Oceans Canada did not comment on the recommended 7-day temporal/30 km spatial buffer associated with the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab included in the EA, suggesting that its reviewers do not have an issue with it. Subsection 5.5.3.3 of the EA, Avoidance of Fisheries Science Surveys, is quite clear about WesternGeco's avoidance protocol associated with fisheries science surveys. WesternGeco will ensure that planned mitigation measures to minimize potential interactions with the fishing industry as outlined in the environmental assessment are maintained during all active fishing periods.

Appendix 1, pg A1-3 – Again, FFAW-Unifor does not believe that there were adequate consultations to inform fish harvesters about this lengthy and expansive program prior to its expected commencement.

Response: The response to the FFAW/Unifor general comment on page 1 is also applicable to this comment.

Literature Cited

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Personal Communication

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