



PO Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

January 15, 2016

Ms. Elizabeth A. MacDonald, B.Sc, EP
Advisor, Environmental Affairs
Conservation Officer

Canada-Nova Scotia Offshore Petroleum Board
1791 Barrington Street
8th Floor, TD Centre
Halifax, NS, B3J 3K9

Dear Ms. MacDonald:

RE: DFO Maritimes Region Comments on the Canada-Nova Scotia Offshore Petroleum Board Draft Strategic Environmental Assessment Report for the Sydney Basin and Orpheus Graben areas

This letter outlines comments of Fisheries and Oceans Canada (DFO), Maritimes Region, on the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) draft Strategic Environmental Assessment (SEA) report for the Sydney Basin and Orpheus Graben areas. In this review, DFO notes that the intent of the SEA report is to provide a general overview of the existing environment and identify the potential environment-offshore petroleum exploration activity interactions, as well as associated mitigation requirements that exist and need to be considered. Further, the SEA reports will be used as a primary basis for scoping and defining the parameters of subsequent project and activity-specific reviews pursuant to the Board's environmental management and review process.

To date, DFO has contributed to this SEA process by providing comments on the scope for the SEA and facilitating access to DFO data holdings for improved mapping and more accurate representations of the ecosystem and human use in the area. We note as well that detailed comments were provided on previous SEA reports completed in 2013 for Misaine and Banquereau (2A) and Eastern Scotian Slope and Laurentian Fan (2B) areas. Notwithstanding the comments contained in this review, it is recommended that DFO's comments on the Area 2A and 2B reports and other publically available information on recent exploratory programs also be consulted for their application, as appropriate.

DFO's review of the document identifies several important issues related to the department's mandate that require further attention. One key issue is that the document appears to require significant editing. With the short review timeline, DFO only conducted a high level content review and, although the comments may capture some of the editing issues, we recommend a thorough review of the document for conflicting and incorrect information, incorrect or missing references, labelling of figures, incorrect listing and scientific names of species, and unnecessary repetition of information.

DFO also believes that the SEA does not fully satisfy the criteria under the Purpose and Objectives section of the scoping document, specifically with respect to the following:

- Identify, where appropriate, activities / areas that may require additional or enhanced levels of mitigation, and identify, if feasible, the type and level of enhanced mitigation required;
- Identify follow-up (environmental effects monitoring) measures, as appropriate, that may be required to verify EA predictions and/or the effectiveness of mitigation related to future offshore petroleum exploration activities;

In particular, DFO highlights the following issues in the SEA reports as requiring additional or improved information, description and/or consideration:

Application of Statement of Canadian Practice: Portions of the marine area and certain species encompassed by the SEA reports present the type of circumstances envisioned by the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* (SOCP) as requiring enhanced treatment and consideration of additional mitigation measures. It is important to emphasize that the SOCP sets out minimum acceptable standards and does not include a complete or exhaustive list of mitigation and monitoring requirements, particularly around species of special status and measures. The SEA should identify follow-up (environmental effects monitoring) measures, as appropriate, that may be required to verify EA predictions and/or the effectiveness of mitigation related to future offshore petroleum exploration activities. The SEA should also provide information around the reliability and limitations of known mitigation measures. This is useful for providing the "state of the art" knowledge for the area to assist in scoping future activity-specific assessments. DFO recommends referencing and including other publically available information on enhanced mitigation, such as DFO's report, *Review of Mitigation and Monitoring Measures for Seismic Survey Activities in and near the Habitat of Cetacean Species at Risk* (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2015/2015_005-eng.pdf).

Sea turtles: The study area overlaps with important areas identified for the Species At Risk Act listed (Endangered) leatherback sea turtle. The study areas are highly important to the biology of leatherback sea turtles. DFO notes that the SEA does not provide an adequate treatment of this species, particularly in terms of their distribution, use of the area, and appropriate mitigation methods. This SEA area is part of the proposed critical habitat that was developed using satellite tracking of individuals that occurred in the area and contains the primary site for local field research. Appropriate references are provided within the department's detailed comments.

Commercial, recreational and Aboriginal fisheries: DFO notes that these areas are important for a number of fisheries, including invertebrate, pelagic and groundfish species. It is important that the SEAs place an emphasis and provide direction on the need to avoid and/or minimize negative interactions with the fisheries in the area, particularly those related to productivity, important life stages and biological processes, fleet access, and catch rates. DFO also notes that the fisheries protection provisions under the *Fisheries Act* include both fish that are directly harvested and fish that support commercial, recreational and Aboriginal fisheries.

Accidental events: The SEA does not thoroughly review and evaluate potential impacts from spill scenarios, mitigation, regulatory processes or current response technologies such as the use of Spill Treating Agents (e.g., chemical dispersants), capping stacks and other response measures.

In closing, DFO would like to thank the Board for the opportunity to review and provide comments on the draft SEA report. DFO recognizes the importance of preparing comprehensive and authoritative SEAs to guide project-specific reviews and future exploration activities. DFO also notes our collaborative work with the Board to define appropriate protection, mitigation and monitoring measures for the special areas and species identified throughout offshore Nova Scotia. This collaborative work is consistent with the intent of our shared Memorandum of Understanding and associated annual work plan activities. This work will both serve to improve clarity around expectations for future exploration activities and enhance environmental safeguards for this important marine area.

If you have any questions or concerns regarding DFO's review and comments, please do not hesitate to contact Michael Wambolt by telephone, 902-802-7051, or by email, michael.wambolt@dfo-mpo.gc.ca.

Yours sincerely,



Rhea King
Regional Director
Ecosystem Management
Maritimes Region

cc: Paul Gentile
Glen Herbert
Mark McLean
Marci Penney

Attached: Detailed Comments

DETAILED COMMENTS:

Page 2 of Executive Summary-Marine Mammals: Sowerbys Beaked Whale is incorrectly noted as listed by COSEWIC and not SARA. They are listed as Special Concern under Schedule 1 SARA.

Page 3 of Executive Summary- Fisheries:

Sea Urchin and Scallop are also important inshore fisheries

Page 9 Section 2.1.4 Authorization and Approvals: This section should be expanded to include review and approvals from other departments. For example DFO will review any proposal for compliance with the Fisheries Act, Species at Risk Act, and Oceans Act and may be required to issue authorizations, permits or approvals for projects or project activities. DFO would also provide expert advice to the CNSOPB during their review of project activities.

Page 10 Section 2.1.5 Environmental Assessment: This section should also be expanded to outline that other numerous stakeholders participate in the CEAA process including other Federal Departments such as DFO and EC.

Page 13 Table 2-1 Seismic Surveys: We have recently had two major seismic surveys offshore Nova Scotia that used 3D Wide Azimuth technology that was significantly larger than is referenced here. This table should indicate that the surveys can cover significant areas, utilize multiple vessels at more than 1km spacing and have streamers up to 10 km long to give the reader a good understanding of recent surveys that have occurred. The table is also missing some key environmental issues. It should also include sub-lethal effects on marine wildlife such as behavioral impacts and masking/disruption of communication (these are important effects on marine mammals that have not been included), and should also consider that there are potential lethal effects on marine wildlife, for example, PTS could be lethal for marine mammals. Accidental spills and discharges can expose marine wildlife in general to contaminants, not just seabirds (e.g., many of the listed impacts on birds are also true for marine mammals). The general presence of vessels in an area, including seismic vessels, also pose risk of ship strikes and disturbance/masking due to vessel noise for marine mammals (these potential effects are not currently included in the list). Gear in the water (e.g., streamers, airgun arrays) also poses a potential entanglement risk. Many of these environmental issues will be the same for Tables 2-2 and 2-4.

Page 15 Table 2-2 Seabed Surveys: Seabed surveys can be much larger than the spatial boundaries indicated in the table. Although these do not look at the entire exploratory licence are they typically look at multiple locations and cover “prospective zones” that may be significantly larger than 1km as the document indicates.

Page 17 Table 2-3 Offshore Exploration and Drilling: Drilling waste, including drilling muds and associated rock cuttings should also include excess cement that is also deposited to the seafloor. Deep water wells like the ones currently being drilled off of Nova Scotia can take up to 120 days per well.

Key environmental issues

Should add the term “Blowout” into key environmental

Page 23 Section 3.1.1 Bathymetry: This section should note that the SEA covers portions of the Laurentian Channel that are in excess of 300-400 metres depth.

Page 35 Section 3.2.2 Ecosystem Overview: Recommend including Crab as a key species along with Shrimp and Lobster.

Page 26 Section 3.1.2.4 Fog and Visibility: It is stated that “The monthly and annual frequencies of occurrence of each [visibility] state are shown in the Figures and Tables which follow” but no figures/tables showing this information are provided.

Page 49 Table 3-3 Ichthyoplankton (Pelagic Larval Fish and Eggs): The only known herring spawning location listed in table is Sable Island Bank. Known herring spawning areas within the study area along the coast of Cape Breton are: Red Grounds, Glace Bay, and the Big Shoal (Power et al 2010. Evaluation of 4VWX herring. DFO Can. Sci. Advis. Sec. Res. Doc 2010/111:Vi+89 p.)

Page 52 Section 3.2.6.1 Overview of Main Taxa: The table should be edited as it includes many inconsistencies in what is included for each species.

Page 53: Add species name to Rock crab

Page 55- add Atlantic wolffish to list of species that prey on whelk

Page 71 – source for Figure 3-12?

Page 75 – correction- significant sponge areas that protected areas (closed to bottom contact fishing) are: Emerald Basin Vazella Closure, Sambro Bank Vazella Closure. The statement that neither of these are within the study area is correct

Page 75 Section 3.2.6.4.3 Other Biogenic Habitat Types and Table 3-8 – The use of EBSA in this section is confusing. I would suggest the term EBSA be reserved for those areas identified by DFO as Ecologically and Biologically Significant Areas. The biogenic habitat types, bioturbators and benthic physical features identified by Kenchington (2014) are not EBSAs in themselves, but many are included in EBSAs identified by DFO. Perhaps a separate term, such as important benthic habitat types (?), could be used to distinguish these from the official DFO EBSAs described in section 3.2.12.3.

Page 94-95 (also possibly page 107 as well) Section 3.2.7.2 Pelagic Species – add known coastal spawning areas for Atlantic herring to the table - Red Grounds, Glace Bay, and the Big Shoal (Power et al 2010. Evaluation of 4VWX herring. DFO Can. Sci. Advis. Sec. Res. Doc 2010/111:Vi+89 p.)

Page 82 Table 3-9 Invasive Marine Species: Missing European Sea Squirt (*Ascidella aspera*)

Page 84 Section 3.2.7 Marine Fish: “Note DFO does not conduct annual RV surveys within the Channel as the water is too deep for this survey” This statement is incorrect. Although DFO may not conduct surveys in the area, RV surveys are conducted on an annual basis in significantly deeper water.

Page 94 Table 3-12 Pelagic Species: Basking shark is COSEWIC listed Special Concern, Atlantic herring-harengus repeated

Page 100 Table 3-13 Pelagic Species: This table also needs editing. It says it is for ‘other’ (i.e., less common) pelagic fish, but includes demersal fish species, and pelagics that were already covered off as common pelagic species in table 3-12

Page 102 Table 3-14 Diadromous Species:

Page 101 Salmon are also an important Aboriginal Fishery

Page 103 There is also an Aboriginal and recreational fishery for Gaspereau

Page 103 Throughout sections of the province there is a commercial elver fishery

Page 107 Section 3.2.7.4 Overview of Important Commercial Fish Species:

Atlantic Herring scientific name harengus is not repeated should read *Clupea harengus*

Page 119 Section 3.2.7.7 Table 3-17 Summary of Key Spawning Times and Areas: Atlantic herring spawning area location “St Anns Basin” – do they mean St. Anns Bank? Suggest update with Red Grounds, Glace Bay, and the Big Shoal.

Page 140-141 Section 3.2.9 Marine Mammals: The DFO sightings records are not only incomplete, but they also do not provide data on effort and therefore it is not known if areas with no sightings are due to lack of whales or due to lack of effort. This is a key point when using opportunistically collected data that should be carefully considered in such an assessment. DFO also recommends that the map incorporate other databases beyond the DFO marine mammal sightings database. This may not accurately reflect species such as the North Atlantic Right Whale that would be better captured using information that can be obtained from the National Oceanic and Atmospheric Administration (NOAA)

Page 141 Section 3.2.9: “Odontocetes” includes not just dolphins and porpoises, but also toothed whales.

Page 141-144 Table 3-23: Comments on occurrence in the study area is provided for some, but not all species (e.g., it is stated that “humpback whales are relatively common in the study area”, while no comments are provided on the occurrence of blue whales). It is also unclear what criteria were used for determining whether or not a species was common, uncommon or rare in the study area. How was this evaluation conducted, and was it conducted consistently across all marine mammal species provided? Were factors such as detectability incorporated into the evaluation if it was based on sighting data? Given the limited data available, I would argue that we do not know if species for which we lack sightings data such as sei whales are common or uncommon in the study area. For sei whales, the Lawson and Gosselin (2009) study referenced only includes results of a single survey and provides but a snapshot of cetacean distribution off eastern Canada. Few sei whale sightings during this survey in July/August 2007 does not necessarily mean that there are always few sei whales in this area (having data from only one season does not consider possible seasonal variation in occurrence, or possible inter-

annual variation in occurrence). Additionally, because the DFO sightings data does not provide information on effort, it is unsure if a lack of sightings is due to a lack of animals in the area or lack of effort in this area. As noted above, this is a key issue when there are few effort-based data available that needs to be taken into careful consideration. All of these comments also apply to Tables 3-24 and 3-25.

Page 146-149 Table 3-24: Sowerby's beaked whales are the second most commonly sighted beaked whale in Atlantic Canada (after northern bottlenose whales), though sightings tend to be concentrated on the edge of the Scotian Shelf. It is possible that these whales also occur in the study area and should also be considered, especially since much rarer species such as Cuvier's, True's and Blainville's beaked whales are considered in the document.

Page 155 Section 3.2.9.3: There is a major breeding colony of harp seals occurs on ice floes off the Magdalen Islands in the Gulf of St. Lawrence every spring, which is relatively close to the study area (perhaps closer than Sable Island?). Why was this not considered?

Page 158 Section 3.2.10: Sea Turtles

Much of the SEA represents important summer-fall foraging habitat for leatherback turtles. In fact, the primary site for field research lies within the SEA boundaries (see Wallace et al.,). The sightings map included on page 161 of the SEA, and the corresponding text, does not convey the importance of this area to leatherbacks. Also see James et al. and DFO could likely provide a map with the proposed critical habitat that was developed using satellite tracking.

Wallace BP, Zolkewitz M and James MC (2015) Fine-scale foraging ecology of leatherback turtles. *Front. Ecol. Evol.* 3:15. doi: 10.3389/fevo.2015.00015

Michael C. James, Scott A. Sherrill-Mix, Kathleen Martin, Ransom A. Myers (2006) Canadian waters provide critical foraging habitat for leatherback sea turtles. *Biological Conservation* 133 (2006) doi:10.1016/j.biocon.2006.06.012

Page 165 Section 3.2.11.1 Table 3-28 Fish Species at Risk and Species of Conservation Concern:

- Acadian Redfish is in the family Scorpaenidae
- American Eel is in the family Anguillidae
- American plaice is in the family Pleuonectidae

- Atlantic Bluefin tuna is in the family Scombridae
- Atlantic sturgeon is in the family Acipenseridae
- Blue Shark is in the family Carcharhinidae
- Cusk scientific name is *Brosme brosme*
- Deepwater redfish should be separated in to two populations the Northern is listed as Threatened the Gulf of St. Lawrence and Laurentian Channel is listed as Endangered by COSEWIC
- Porbeagle should state shark
- Roughhead Grenadier is listed as Special Concern by COSEWIC
- Smooth Skate is listed as Special Concern by COSEWIC
- White Hake is in the family Gadidae and the Southern Gulf of St. Lawrence population overlaps the area and they are listed as endangered.
- Winter Skate population should be listed as Eastern Scotian Shelf

Please check all other tables in document to confirm that the listing, scientific name and population are correct.

Page 178 Section 3.2.11.3.1 Marine Mammal Species at Risk and Species of Conservation Concern:

These two statements are incorrect: “A total of five federally listed marine mammal Species at Risk (blue whale-Atlantic population, North Atlantic right whale, northern bottlenose whale-Scotian Shelf population, fin whale-Atlantic population and harbor porpoise-Northwest Atlantic population) are known to occur in the Study Area (Table 3-32). Additional species that may occur in the Study Area include the killer whale (Northwest Atlantic and Eastern Arctic populations), and Sowerby’s Beaked whale (Atlantic Ocean), species which are listed by COSEWIC but not under SARA (Table 3-32).” As indicated in Table 3-32, harbor porpoise are not listed under SARA. Sowerby’s beaked whales, however, are listed under SARA as Special Concern and could potentially occur in the study area.

Page 178 Table 3-32: Why are North Atlantic right whales considered to be very rare in the study area, while blue whales are considered to be present in small numbers? In Figure 3-25, there are more right whale sightings than blue whale sightings in the study area. Again, it is not clear how potential presence in the study was evaluated, nor is potential presence consistently recorded throughout the table – is “present in small numbers throughout the year” different than ‘present year-round’ and “small

numbers observed throughout the year”? Need to also make sure what is stated as presence in study area in Table 3-32 is consistent with what is written in Tables 3-23 and 3-24.

Killer Whale should indicate population name

Harbour porpoise is listed as Schedule 2 Threatened under SARA

Humpback should be listed and is Schedule 3 Special Concern

Page 182 Section 3.2.12.2 Bioregions and Large Ocean Management Areas: The information in this section is out of date. Remove reference to the Eastern Scotian Shelf Management Initiative, as this initiative has now concluded. DFO Maritimes’ current approach to coastal and ocean management for the Scotian Shelf bioregion is described in the Regional Oceans Plan.

Page 183 Section 3.2.12.3 Ecologically and Biologically Significant Areas: remove the reference to LOMAs. EBSAs are not restricted to LOMA boundaries. Change the term “benthic EBSAs” to a different term (e.g., important benthic habitat types) as suggested above.

Page 183 Table 3-34 Coastal EBSA’s within the Study Area: The information in this table is taken directly from tables provided in Hastings et al., 2014. However, the “fitness consequences” column combines information on fitness with information on resilience, ecologically significant species and community properties, and special designations. These should be moved to their own column(s) so that the information remains consistent with Hastings et al., 2014.

Page 216 Section 3.3.1.3 Fishery Management Zones: a portion of LFA 31B is also included in the study area. CFAs 20-22 are merged into N-ENS crab fishing area.

Page 221 Section 3.3.1.4 Data Sources: [edit sentence as shown in red] Government policy is to only release aggregated data, with a minimum aggregation of five license IDs, five fisher identification numbers, and ~~five~~ five vessel IDs.

Page 221 Section 3.3.1.5 Harvesting Seasons Table 3-41: Summary of Fishing Seasons citation may be incorrect and authors name spelling error (Horsman not Horseman) If this table is to be used the scope of the fishing seasons should be clarified (entire province, Maritimes etc..) or the table should only reflect fishing season openings within the SEA boundaries.

Page 225 Section 3.3.1.9 Shellfish and Crustaceans: Suggest adding Sea Urchin fishery to the text.

Page 227 Section 3.3.1.11 Gear use areas: Add the following text: Privacy-screened areas in DFO maps indicate NAFO unit areas that are not compliant with the rule of no less than five fisher IDs, license IDs and vessel IDs.

Page 228-247 Section 3.3.1.11 Gear Use areas: Suggest adding a source line (DFO EM, DFO data division, created from landings information) to each of the maps for reference

Page 248 Section 3.3.1.12 Licences and Enterprises: Suggest adding reference to this table

Page 250 Table 3-43: Add units to the table caption: (landings in kg)

Page 282 3.3.1.17 Recreational Fisheries: This section should be re-written as it contains numerous errors including the differentiation between tidal and intertidal waters. There are a number of different open and close times for different species, however this section does not capture the large winter fishery for species such as trout and smelt in places such as the Bras D'Or Lakes. DFO suggests at minimum visiting the Nova Scotia Angling Guide and correcting the errors.

<http://novascotia.ca/fish/documents/2015anglingguide.pdf>

There is also a recreational fishery in Tidal waters for a number of fish and invertebrate species that is not captured in this section as well.

Page 284 Section 3.3.1.18 Aboriginal Fisheries: New suggested text in blue and it is recommended to remove the strike through sections in the second paragraph.

It should be noted that in addition to First Nation *communal commercial livelihood* fishing, Mi'kmaq harvesters are active in a number of food, social, and ceremonial fisheries. ~~which is conducted in accordance with Mi'kmaq Treaty and Aboriginal Right.~~ The specific location and harvest levels *are not well documented.* ~~and associated socio-economic importance is significant.~~ The specific details of this fishery is beyond the scope of an SEA, *as is* and the subject of the Treaty relationship between the Mi'kmaq and Canada. Direct consultation *with* ~~between Canada and~~ the Assembly of Nova Scotia

Mi'kmaq Chiefs would be required to determine the specific nature and extent of the Food, Social, and Ceremonial fishery.

Page 293 Section 3.3.3.1 Marine shipping and transportation: The study area is located in a very busy marine traffic corridor. DFO suggests the addition of a marine traffic density map or maps to illustrate expected levels of vessel traffic in the area (e.g., maps illustrating vessel traffic density based on Long Range Identification and Tracking Data can be found in [Koropatnick et al., 2012](#) and are available by request to OCMD).

Page 299 Section 3.3.3.6 Marine Cables Table 2-56: There is a second Persona/Eastlink submarine cable from Sydney Mines to Port aux Basques that is missing in the table and the map in Figure 3-88; Only one Persona cable runs from New Victoria to Rose Blanche, not two. Also missing are two active Bell Aliant APOCS submarine cables from Aspy Bay, Cape Breton and North Sydney to Newfoundland. There is no reference to the Emera Maritime Link study area for a HVDC power cable from Cape Breton to NL.

Page 302 Section 3.3.3.8 Unexploded Explosive Ordnances: This text should be reviewed by Defence Construction Canada (Nick Sanders, DCC) to ensure that it is current with their latest UXO mapping info.

Page 306 Section 4: First two paragraphs start without a heading making them appear as part of the previous section.

Page 324 Section 5.1.1.1.3: – Potential indirect effects such as impacts on cetacean prey and habitat quality should be considered somewhere in this section.

Page 325 Section 5.2.1.1.3.1 Hearing Ability: Possible injuries to hearing are extremely difficult to assess in marine mammals at sea, and thus it is not surprising that few hearing injuries related to seismic activities have been reported. However, based on current literature on TTS and PTS thresholds in marine mammals, it is known that seismic airgun and multibeam survey sounds do indeed have the capability to cause hearing threshold shifts in marine mammals, if they occur within close enough range to the sound source. It is important to consider that these loud sound sources do have the potential to injure marine mammals, whether or not such injuries have been observed. Thresholds for TTS and PTS thresholds

should be thus be considered and discussed. Note that section 5.2.1.1.3.3. contradicts statements made in this section.

Page 325-328 Section 5.2.1.1.3.2: It is important to note that while 160 dB re 1 uPa (rms) is sometimes used as a threshold for behavioral disturbance, some recent studies have demonstrated marine mammals reacting to sound sources at much lower levels than this (for some examples, see: Theriault and Moors-Murphy 2015: http://www.dfo-mpo.gc.ca/csas-sccc/publications/resdocs-docrech/2015/2015_078-eng.pdf). This corresponds with the statement on page 327 “Some recent studies have, however, shown avoidance or other disturbances up to several hundred kilometres away from seismic airguns source arrays, and well after the survey is completed (Nieukirk et al. 2004, 2012; Risch et al. 2012; Castellote et al. 2012).” It is important to consider this when determining appropriate thresholds for behavioral impacts.

Page 328 Section 5.2.1.1.3.3 Physical Effects: Note that seismic surveys occurring off Nova Scotia since 2013 have used NOAAs draft guidance on acoustic threshold levels for PTS and TTS (http://www.nmfs.noaa.gov/pr/acoustics/draft_acoustic_guidance_2013.pdf) to establish TTS and PTS thresholds. These thresholds based on the most up-to-date scientific information should be discussed in this section.

Page 332 Section 5.2.1.2.3 Potential Interactions with Marine Mammals and Sea Turtles: – A thorough review of impacts of drilling activities on marine mammals is not provided. Drilling activities, which can produce significant amounts of noise, may have many of the same potential impacts as seismic survey activities and such possible impacts should be discussed. Should the last paragraph in this section be part of Section 5.2.1.3 instead?

Page 333 Section 5.2.1.3.3 Potential Interactions with Marine Mammals and Sea Turtles: A thorough review of impacts of increased vessel traffic (both ships and aircraft) on marine mammals is not provided.

Page 334 Section 5.2.1.4 Well Abandonment/Decommissioning: A thorough review of impacts of well abandonment, particular possible use of explosives to detach the wellhead, on marine mammals is not provided.

Page 337 Section 5.2.1.5.3 Potential Interactions with marine Mammals and Sea Turtles: A thorough review of impacts of accidental spills on marine mammals and turtles is not provided.

Page 338-342 Section 5.2.2 Environmental Mitigation Measures: The use additional/enhanced mitigation measures beyond the current Statement of Canadian Practice should be considered when conducting seismic operations in waters where cetacean species at risk occur, as recommended by DFO 2015 (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2015/2015_005-eng.pdf). As well, DFO along with the CNSOPB be requiring submission of a detailed Marine Mammal Monitoring Plan for any future seismic operations. Several studies show that reducing vessel speed (to below 10 knots) in areas of importance to cetaceans, particularly species prone to vessel strikes such as right whales (e.g., <http://onlinelibrary.wiley.com/doi/10.1111/j.1748-7692.2006.00098.x/abstract;jsessionid=9749D54F8C108C2E2A9CED90B7933F57.f02t03>, http://www.int-res.com/articles/esr_oa/n023p133.pdf), can reduce fatality of a vessel strike should one occur and should be considered as a possible mitigation measure.

Page 351 Section 5.2.3.3 Marine Mammal Species of Special Status: Note that this section, which states that there are “seven federally listed marine mammal species at risk” contradicts Section 3.2.11.3.1 which states that ““a total of five federally listed marine mammal Species at Risk...” As well, as mentioned above, harbor porpoise are not listed under SARA schedule 1 (but are listed under COSEWIC), and Sowerby’s beaked whale should be included in this list (listed as Special Concern under SARA schedule 1).

This section also mentions Beluga-St. Lawrence Estuary population, a species that is not referenced in other sections. This and all other text, tables and figures should be corrected for consistency throughout the document (added or removed).

Page 353 Sections 5.2.3.4 Sea Turtle Species of Special Status: Should use Sea Turtle specific information and not rely on the EBSA summary document. Also see comments in Section 3.2.10 on Sea Turtles.

Page 364 Section 5.4.1 Potential Environmental Interactions and Existing Knowledge: One reference that may be useful for this and other sections would be the Ecological risk assessment of St. Anns Bank

Area of Interest <http://www.dfo-mpo.gc.ca/Library/353381.pdf>. Section 3 of this document focuses on Oil and Gas Exploration.

Page 365 Section 5.4.1 Potential Environmental Interactions and Existing Knowledge: The findings from the acoustic monitoring program for seismic noise in the Gully (the largest submarine canyon in the NW Atlantic) is not relevant for the current study.

Page 372 Section 7.2.1 Species of Special Status: It has not been made clear how cumulative environmental effects will be evaluated for species of special status, including cetacean species at risk.

Page 375 Section 8 Information Availability, Requirements and Opportunities-Need: this section should be significantly expanded to include research into specific exploration activities (Seismic, drilling etc.) and the effects and mitigation in the event of an oil spill.

Page 375 Section 8.2 Commercial Fishing: Acronym for Nova Scotia Department of Fisheries and Aquaculture (NSDAF) The second paragraph uses NSDNR (Natural Resources)

Page 376 Section 8.3 Protected Areas: Elsewhere in the document, offshore and coastal EBSAs are featured as special areas of ecological and/or biological significance in the study area, and available information about important features found in these EBSAs has been used to characterize sensitive habitats/species in within the study boundaries. Why then does this section claim that only 'several' of these areas exist, and little is known about their location and physical/biological characteristics?

Page 382 Section 9.1.4 Table 9-4 Include special consideration for special areas, including MPAs/AOIs and EBSAs, in spill response planning as part of listed mitigation.