	REVIEW COMMENTS	WHERE / HOW ADDRESSED
General Comments		
G1	DND April 2, 2014 Comments (**Attachment 1**)	DND submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. DND comments that "neither an impact assessment nor the mitigations measures provided are reflected in the draft report". There is no "impact assessment' per se, as this is an SEA (see SEA Scoping Document) and not a project-specific EA which assesses particular effects. Although not related to any of the specific VECs that are included in the SEA (again, see SEA Scoping Document), the mitigation measures related to UXOs have been added in Section 4.3.5.5 of the SEA Report
G2	Newfoundland & Labrador Oil & Gas Industries Association (NOIA) April 4, 2014 Comments (**Attachment 2**)	NOIA submission reviewed and considered in preparing the Draft #3 SEA Report.
G3	Long Distance Fleet Regional Advisory Council (LDRAC) April 10, 2014 Comments (**Attachment 3**)	LDRAC submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. The various environmental issues and other items raised therein (eg, potential effects on VMEs) are addressed in the Draft SEA Report. Information on the nature and amount of fishing activity in relation to the VMEs has been raised in other comments (see below) and added to the Fisheries section of the Draft SEA Report. Other items and questions from that submission (e.g, potential establishment of a compensation program for fishers) are larger, policy items that are beyond our scope and mandate in preparing the Draft SEA.
G4	North Atlantic Producers Organization April 11, 2014 Comments (**Attachment 4**)	NAPO submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. The various environmental issues and other items raised therein (eg, potential effects on VMEs) are addressed in the Draft SEA Report. Information on the nature and amount of fishing activity in relation to the VMEs has been raised in other comments (see below) and added to the Fisheries section of the Draft SEA Report. Other items and questions from that submission (e.g, the

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		C-NLOPB's areas of jurisdiction, potential exclusion of all oil and gas activities in the VMEs, a requested reply to the NAPO on these and other items) are larger, policy items that are beyond our scope and mandate in preparing the Draft SEA.
G5	European Commission April 15, 2014 Comments (**Attachment 5**)	EC submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. The various environmental issues and other items raised therein (eg, potential effects on VMEs, seismic effects on marine biota and any associated information / knowledge gaps, interference with fishing activity / safety zones) are addressed in the Draft SEA Report. Information on the nature and amount of fishing activity in relation to the VMEs has been raised in other comments (see below) and added to the Fisheries section of the Draft SEA Report. In the SEA Fisheries Section (of Ch 5) we have added some text to further reference the limited manoeuvrability of offshore geophysical survey vessels during survey activity (due to the length of the deployed streamer and other factors), and associated possible implications for fisheries interference.
G6	Northwest Atlantic Fisheries Organization April 16, 2014 Comments (**Attachment 6**)	NAFO submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. The various environmental issues and other items raised therein (eg, potential effects on VMEs) are addressed in the Draft SEA Report. The information provided on the nature and amount of fishing activity has been added to the Fisheries section of the Draft SEA Report. NAFO (2014) correspondence was also used to: 1. Identify potential interference of oil and gas activity on stock assessment research surveys (Ch 5) 2. The information provided by NAFO on the status of fish and invertebrate species were used to add NAFO specific information for the dominant fish species described in Ch. 4. 3. Information on VME Indicator species was added/updated. In particular we highlight new VME indicator species and a description of the known areas of high concentration. We have also updated the distribution descriptions of other VME Indicator species (e.g. corals, sea pens etc.) based on the information

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		provided by NAFO.
G7	Canadian Association of Petroleum Producers (CAPP) April 16, 2014 Comments (**Attachment 7**)	CAPP submission reviewed and relevant comments and information were considered in preparing the Draft #3 SEA Report. Relevant data gaps are referenced throughout and are summarized (together) in Section 5.7 of the SEA Report. The boundaries of the SEA Study Area were as defined by the C-NLOPB in the SEA Scoping Document. Additional reference to the federal *Fisheries Act* (2012) has been added in Section 4.2.1.1. There are existing references to the federal *MBCA*, but additional reference has been added in Section 4.2.2 and in Ch 5 Identified environmentally sensitive areas (such as VMEs, MPAs, AOIs etc) are discussed and mapped throughout the SEA Report. The focus of the socioeconomic components of the SEA (and esp, the environmental assessment itself) is on fisheries, as specified in the SEA Scoping Document. The ESRF and other such programs are referenced throughout the SEA Report. Government's and industry's approaches to spill prevention and response (incl continuous improvement) are referenced in the SEA Report. The scope of the SEA does not include "providing qualitative or semi-quantitative estimates of levels of risk for VECs" – Although it does provides an analysis of potential environmental issues, mitigations and planning considerations, as per its scope and standard SEA practice. WBMs and SBMs are described throughout the document. Additional reference to pre-drilling surveys has been added in Ch 5. Re the comment "There is also much redundancy in the latest draft of the 2014 Eastern NL SEA draft report. For example, fish are assessed in the 'Fish and Fish Habitat', 'Species at Risk' and 'Other Key Species' and 'Commercial Fisheries' VECs" – We do not feel that this structure results in redundancy, but in any event, we have followed the requirements of the SEA scoping

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		document (and associated VECs / structure). If there is any repetition between Ch 4, 5 and 6 of the SEA Report, this is also unavoidable given the specified summary requirements.
G8	The authors have added the 500 m contour to the legends for the maps, in order to indicate bathymetry. Unfortunately, the manner in which the bathymetry is indicated is unclear, and appears to be incorrect. While the authors have labelled the 500 m contour, in fact all the maps have the 100 m and 200 m contours, and then the remaining contours at intervals of 500 m. The choice of contour intervals is appropriate, but the labelling should be more accurate. Labelling every contour line, as in figure 4.6, would be inappropriate for most of the maps, but the authors should consider using darker or thicker cont.	A contour interval was added to all Figures in Draft #2 in response to a request made by the C-NLOPB during the review of Draft #1. The reviewer is correct in observing that the maps show contours at 500 m, but also include contour lines that pertain to other depth intervals. This was somewhat unavoidable given the nature of the bathymetry of the region – in that in some cases it is necessary to show < 500 m contours to illustrate key bathymetric features in the area, but this was difficult across all of the study area as in some places the counters become somewhat "crowded". For most Figures, the contours are included for general biophysical reference rather than to determine specific depths. To address this issue, we have gone with a single and consistent contour interval on all Figures in Draft #3 – namely, the 100 m interval - and we have applied a "line thinning" in the GIS that makes the contour lines less "crowded"
	Furthermore, some of the labelling of features in figure 4.6, bathymetry, is incorrect or ambiguous (e.g. Sackville Spur, Flemish Pass). Contour lines for the 500 m, 2000 m, and 4000 m contours, to highlight different bathymetric zones.	The location of the labelling of these features has been revised slightly in all applicable Figures to address this. See above response to comment # G8
G9	Cited references should be carefully proofread. Some missing references such as Knudby et al. 2013 and Piper et al. in press.	The reference issues noted have been addressed through relevant checks / additions to the bibliography and/or updates to the relevant text of the SEA Report. It is anticipated that the references (citations and bibliography) in the SEA Report will continue to be added to and otherwise evolve as we move towards a Final Report (ie, adding new ones, subtracting others, and these and other changes - which will affect the ordering and "lettering" of the references (eg, DFO 2013a, 2013b etc etc). Therefore, a final and detailed reference check will also occur as part of the next (Final) version of the SEA Report.
G10	The Consultation Report was inclusive of most of the comments made at the sessions attended by FFAW members but would reiterate a point made strongly by one of the harvesters at the meeting in St. John's. The Carson Canyon (NAFO Division 3N) is a significant crab fishing area for our full time large supplementary fleet. A portion of NL 13-02, a parcel of land currently out for bid by the C-NOOPB, is located in this important fishing area. Furthermore, a considerable amount of crab fishing also takes place just north of the 46°0'0"N line (see Figure 4.138	This information / item has been added to the SEA Consultation Report, as requested.

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on page 353). It is also suggested that stakeholder consultations be conducted during the process of assessing parcels of land that may be placed out for bid by the C-NLOPB in the future	
Specific Comments	
S1 §3.2 Generic Description of Offshore Oil and Gas Activities, pg 27 –	
• Primary emissions from offshore production in Section 3.2.4 should explicitly list produced water since it is the largest waste stream from that activity.	Produced water was already listed in a subsequent part of this section, but we have moved it up to this bullet list as requested, and added some additional text.
• Spill data for NL offshore should be updated to include 2013. Spill discussion should also include that spills may be due to aging or leaky infrastructure.	Figures, tables and text have been updated with 2013 data from the C-NLOPB. Reference to leaky or ageing equipment as a potential cause has been added.
• Oil spill scenarios under ice should be included in tables where available. Although they are mentioned as part of some of the studies, inclusion in the tables would prove useful.	From primary modelling effort (ASA 2011a), we did not create table row entries for every type of scenario, rather the summary focus was on the three longer term scenarios (Table 3.8) and a range of the results reported for the collection of scenarios (including those in ice) (Table 3.9). It is difficult to make any generalizations or simple summaries on the spill in ice simulation statistics presented in the ASA report (ASA 2011a). There are no spills in ice in the modelling addendum (prepared to simulate for longer durations, (ASA 2011b)). Some general text on this issue has been added to Chapter 3, after Table 3.9
• **Table 3.4, pg 47** – Numbers are not standardized per unit time or capacity; therefore, they are misleading. What are the "lifespans" of the wells in this table – i.e., how many of the 29,527 wells in the 1980's were also operational in the 1970's (and hence double counted)? The total number operating during each period may reduce the apparent blowout frequency by referencing existence in more than one of the time periods. The number of operating wells in 1971-80 plus the number of "new wells" minus the number of "decommissioned wells" would be a more meaningful number in this column in this comparison. The number of exploration vs. production wells would be very revealing also. It is suggested that revising the blowout instances per unit time of well operational life would be more informative than the numbers currently reported	These are the statistics that are available – taken from the Old Harry EA (prepared by another firm). We are not aware of stats reported being standardized per unit time or capacity. This would require a separate study undertaking to attempt to assemble the raw data and tabulate lifespans and the other elements suggested.
• **Table 3.8, pg 58** – Comments in the text related to the table suggest that 2% is some form of benchmark for oil spill dispersion rate. It is not clear what is the basis for reliance on such a number, what the reference authority for this	No benchmark was suggested. In fact, it appears this sentence (or 2% threshold) was inserted in the cited addendum report in error following ASA review. (C. Galagan, ASA, pers. comm.. 11 Jun 2014). And so, the text has now been removed.

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	number is, and whether it is an ecologically useful number.	Instead, the following 'oil on sea surface' observation has been inserted after Table 3.8: " For the simulations run for each of these three extended duration blowout simulations, the maximum percent of total spill volume remaining on the sea surface after 200 days (an arbitrary length of time) ranged from less than 3 percent for the 30 day winter blowout to 7 percent for the 120 day winter blowout to 10 percent for the 100 day summer blowout."
S2	**§3.2.5.1 Spill History of the Offshore Petroleum Industry, pg 46 -**	
	The text has been adjusted to remove the reference to Chapter 5, however, the text still implies that extra-tropical storms only occur during the Summer and Fall months. EC recommends the following statement: "*As noted in Chapter 4, the Eastern Newfoundland Offshore Area is subject to hurricanes, tropical and post-tropical storms in the North Atlantic which can occur during the months of June through November. Additionally, extra-tropical cyclones can occur at any part of the year. Intense extra-tropical cyclones with the potential for hurricane force winds are more likely during the months of November through March."*	Text has been added / edited as requested
S3	**§4.1 Physical Environment, pg 75 -**	
	The description of the physical environment lacks a comprehensive overview on climate change. While there are a few statements regarding climate change, nothing substantive is reported. The SEA document should include general information on the most current projections relative to air and sea temperatures, currents, primary productivity and changes in frequency of extreme weather based on regional climate change models. This would include consideration of which models are considered best right now for the study area in question; and data gaps and key uncertainties. These projections should also be integrated into subsequent areas of text throughout the SEA as required (e.g. the sections on ice and ice bergs as well as in the species accounts where information is available).	A summary section on Climate Change has been added to Ch 4. See also related comments and responses below.
S4	**§4.1.1 Geology, pg 75 -**	
	• Multiple references for Piper (pers. comm.) exist in this section. Since this is an area of active research, and since the SEA is a living document, this section should be updated on a priority basis as the research is published.	We acquired and included the recently published report on sediment failures in the northern Flemish Pass. We have also upgraded many of the personal communication references to actual citations (where possible and accurate). Potential future updates of the SEA are beyond our scope, but this is described in Chapter 1.
	• The explicit risk of a landslide (1/500) is included in the SEA, yet the risks for other geohazards are not specified. This is also reported as a personal communication which may not be particularly useful for future planning. This section	Landslides represent failure resulting from the various types of geohazards. It is not actually a type of geohazard. Also, 1/500 is simply an example of how the landslide recurrence interval of 10,000 years translates

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	should be updated to include the anticipated report from Natural Resources Canada that contains slope failure risk maps. This would provide operators with useful information at the planning stages.	to a hypothetical interval of 20 years. It does not change the actual recurrence interval. This statement has been upgraded from a personal communication to a citation from a recently published report (Cameron et al 2014). With regard to slope failure risk maps, these do not currently exist and will not likely be produced for at least a couple of years. The current mandated priority for the Geological Survey of Canada is the Arctic so NL work is on the back burner at present. (D Piper, pers comm)
	• A map of the features of the Orphan Basin described in this section should be included. They are not in Figure 4.3.	Additional feature labels have been added to the Figure
S5	**§4.1.1.4 Geohazards, pg 82 -**	
	The text on geohazards has been considerably expanded, and the authors have noted that the recommended maps of geohazards in the area are not yet available. The authors have incorporated much new information on geohazards, including statistical return periods of major slope failures. Unfortunately, their discussion of geohazards includes a large number of references to geological features that are not indicated on the map of earthquake epicentres or the map of bathymetry, making the interpretation more difficult for readers not already familiar with the offshore geology of the area (e.g. Orphan Spur, Funk Island Spur). Finally, the heavily cited reference to Piper et al. in press, is not included in the bibliography (unless this is Piper et al. 2011, unpublished MS). These errors should be quite easy to fix.	The reference to Piper et al. has been corrected throughout. Additional feature labels have been added to the Figure
S6	**§4.1.2 Bathymetry, pg 83 -**	
	As knowledge of bathymetry is important to understanding many key aspects of the physical and biological environment, it would be helpful to include major bathymetric contours/features in a clear manner on all maps in the report (e.g., Figure 1.1), similar to that in Figure 2.2. Otherwise, maps provide very little frame of reference.	Please see above response to Comment G8
S7	**§4.1.3 Climatology, pg 85 -**	
	There is a brief description of some elements of climate change and variability in §4.2.1.8, but it is minimal and does not include any recent research. It is located in §4.2 Biological Environment, §4.2.1 Fish and Fish Habitat, a Valued Ecosystem Component, which is not the most appropriate location for the main description of climate change.	As noted above, some additional discussion of climate change has been added to the physical environment section of the SEA Report, as background and context. As noted by the reviewer, there is additional discussion and consideration of climate change in the fish and fish habitat sections of the report. This includes discussion of the recently observed regime shifts in the SEA Study Area as a result of water temperature changes, etc. We would maintain that the discussion of climate change is indeed most relevant to this (biological / ecological) part of the SEA, and especially, in assessing and

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		understanding the existing biological environment (current conditions and variability)in order to describe the potential environmental implications of future oil and gas activity. Fish and fish habitat, for example, is VEC that is carried into the environmental issues / mitigation / planning discussion (Chs 5 and 6), whereas climate – in and of itself - is not.
	EC suggests that a description of projected climate change and variability (and knowledge gaps/uncertainties), over the anticipated time period of exploratory plus production phases, be added to §4.1 Physical Environment. This should make use of results from the most recent available peer reviewed research, such as papers cited in the latest IPCC reports.	As noted above, some additional discussion of climate change has been added to the physical environment section of the SEA Report, as background and context.
S8	**§4.1.3 Climatology, pg 85 -**	
	Precipitation figures need a better explanation for the y-axis indicating whether the frequency of occurrence (%) refers to event duration per month or number of events per month or per day.	Frequency of occurrence (%) is simply the percent of time the given condition(s) occurs in a given month (or annually) A small edit to the text to this effect has been made at beginning of Section 4.1.3.3. For example, in Figure 4.23, in January there are the following % (of the time) occurrences: **Month** **Jan** Rain / Drizzle 6.7 Freezing Rain / Drizzle 0.3 Rain / Snow Mixed 1.9 Snow 21.5 Total 30.4
	The data for frequency of thunderstorms looks odd. Figure 4.26 shows a spike in July while Figure 4.28 has a dip in September. Could these be the result of calculation errors? Since this is 63-year climatology it should not be related to sample size and interannual variability.	The calculations have been checked. We do not believe there are any errors. We have revised the y-axis scales on these graphs to be consistent for the four sub regions: 0 to 32 % and 0 to 3 % which should aid the reader making any comparison between graphs / sub-regions. We do not view the noted values as 'dips' or 'spikes'. Note these frequency of occurrence hail and thunderstorm are generally low percentages. Frequency of occurrence hail and thunderstorm: these are small as illustrated in this sample summary comparison.

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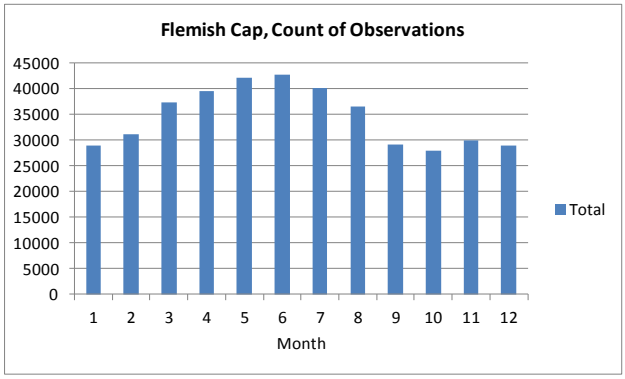
	For Jul/ Sep/ Annual OBasin 1.3 0.4 0.8 FCap 1.8 0.3 0.7 GBanks 0.7 0.14 0.44 TBanks 1.2 0.2 0.6 ICOADS sample sizes are large as illustrated below 
S9	**§4.1.3.1 Wind Conditions and §4.1.4.4 Extreme Wind and Wave Events, pgs 85 & 138 -**
Section 4.1.3.1 Wind Conditions was revised to add more information on definitions of wind averaging period and height. However there was no attempt to adjust maximum values of MSC50 winds presented in these sections to equivalent maximum values of measured or forecast sustained wind speeds. Such adjustment would facilitate comparison with the hurricane frequency statistics presented in 4.1.3.5 Tropical Systems, and with wind warnings in EC's marine forecast program, where the terms gust, storm, and hurricane force refer to specific thresholds for 10 minute sustained wind speeds. Without such adjustments the maximum wind speeds presented in 4.1.3.1 and 4.1.4.4 will under-represent the frequency of hazardous sustained wind speeds as generally understood. To illustrate, Table 4.3 for the Grand Banks gives the maximum hourly wind speed during the months of June to November as 30.8 m/s (60 kt), less than hurricane force, based on more than 50 years of hindcast data. In contrast, a much higher frequency of severe wind speeds is indicated by the hurricane statistics in Figure 4.37, based on a roughly similar 50 year time period. That indicates 15 hurricane strength (>= 64 kt) tropical cyclones affected the Southeastern Grand Banks marine forecast area over that period of time	Correct. The presentation of MSC50 winds is in keeping with the approach for, and the type and level of information that has been included in, other SEAs in the NL Offshore Area. It should be reiterated that the intent here is to provide a regional overview for general illustration, rather than detailed and site-specific climatological information for design and operational purposes.
EC recommends that adjusted maximum MSC50 wind speeds be added to 4.1.3.1 and 4.1.4.4, based on conversion factors such as provided in WMO 2012 "Definition of maximum sustained wind speed of tropical cyclones" World Meteorological Organization TCM-7/Doc 2.1, 4 pg, available online, or other suitable sources. If conversion factors for	As suggested, we have added new rows to Tables 4.1 to 4.4 to report maximum wind speed scaled from a 1-h averaging period to a 1-min averaging period (the 1-min matches the HURDAT reported maximum winds. This has been done following the EC suggested conversion factors provided in WMO (2012) "Definition of maximum

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	maximum winds for different averaging intervals from the ISO19901-1 standards are used, the factors should be provided, since the ISO document is not readily available. The MSC Canadian Waters Extremal Analysis viewer does seem to be working. Perhaps Oceanweather Inc. could provide assistance.	sustained wind speed of tropical cyclones" World Meteorological Organization TCM-7/Doc 2.1, 4 pg. We have selected the "At-Sea"class and gust factor of 1.11, i.e., the new 1-min maximum winds in the table are = 1-h max * 1.11
S10	**§4.1.3.5 Tropical Systems, pg 114 -**	
	As recommended by EC, statistics based on Atlantic Hurricane Database (HURDAT) for 1983 to 2012 were added to this section in order to bring the analysis period up to date. The analysis based on HURDAT was for tropical cyclones with no breakdown by intensity as had been presented in the original analysis. The lower wind threshold for defining tropical storms is relatively low: 34 kt (18.5 m/s) while for hurricanes it is 64 kt (32.9 m/s). EC recommends that the analysis of HURDAT include statistics for hurricane force tropical systems separately from all tropical cyclones, in order to give frequency information on those tropical cyclones that pose the most serious hazards to offshore projects.	We have added a companion Figure 4.39 to Figure 4.38 to report tropical cyclones of hurricane intensity (> 64 knots)
S11	**§4.1.4 Oceanography, pg 118 -**	
	The description on extreme wind and wave events partially captures the level of integration and comprehensiveness that is required to make all the information presented useful. However, it is problematic in that it lacks a climate change context, this should be amended accordingly.	As noted above, some additional discussion of climate change has been added to the physical environment section of the SEA Report, as background and context.
S12	**§4.1.4.4 Extreme Wind and Wave Events, pg 138 –**	
	There are 2 sentences that are not clear: …"milder summer conditions end quickly with a rapid increase in severity in August"… That implies changes in temperatures but the mild sea temperatures may continue into September. In the next paragraph the sentences comparing maximum wave heights between winter and summer vs mean wave heights, and relating that to sea ice is confusing.	Agreed. "Milder" was perhaps not the best choice of words. The changes are not to do with temperature - rather mild = not as harsh. Alternative paragraph has been inserted. Agree, the second paragraph was somewhat confusing and has been removed.
S13	**§4.2 Biological Environment, pg 160 -**	
	Overall, ecosystem structure within the Study Area is not adequately described within the SEA. The Study Area for the SEA essentially expands over at least four different functional ecosystem production units: 1) Grand Bank; 2) Newfoundland-Labrador Shelf (both parts of the Newfoundland-Labrador Shelves marine ecosystem); 3) Flemish Cap (considered a relatively closed marine ecosystem); and 4) oceanic waters beyond the continental shelf break. Furthermore, the Study Area includes the transition areas between these ecosystems, and given the large range in depths involved in SEA Study Area, it may be argued that it also spans bathypelagic and abyssal oceanic ecosystems. These very basic descriptions and their	Text has been added / edited as requested to discuss this further.

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potential implications, currently absent in the SEA, need to be incorporated.	
It should be highlighted that the basic ecoregion structure on the Grand Bank indicates that the Grand Bank and the Labrador-Newfoundland Shelf can be considered ecosystem sub-units, where the northern Grand Bank (NAFO Division 3L) acts as a transition zone between these subunits. It is also clear the existence of a distinct shelf-break ecoregion, which acts as a transition zone (ecotone) between shelf and oceanic realms (Pepin *et al.* 2010, NAFO 2010b, 2012a). The Flemish Cap also emerges as a distinct ecosystem production unit (Perez-Rodriguez *et al.* 2010, NAFO 2010b). Note that the Grand Bank and Flemish Cap are among the candidate ecosystem management units being considered for the development of an ecosystem approach to fisheries by NAFO (NAFO 2010b).	Text has been added / edited as requested We have utilized the references suggested, where these could be identified (by author name and date alone) and obtained.
Although the Newfoundland-Labrador Shelves and Flemish Cap share many of their core species and both have experienced collapses of major groundfish components, the structure of these ecosystems is not identical. For example, the key forage species are sandlance and capelin in the [southern] Grand Bank, and shrimp and capelin in the [northern] Newfoundland-Labrador Shelf; while in the Flemish Cap redfish and shrimp have been key prey species for that ecosystem (NAFO 2010b, 2011, 2012, Perez-Rodriguez *et al.* 2011, 2012). Furthermore, there is evidence in the NL shelves of bottom-up regulation of capelin, its overall core forage fish species, with linkages between environmental drivers (e.g. ice dynamics), phytoplankton blooms, zooplankton abundance, and capelin dynamics (DFO 2012, Buren *et al.* 2014). Here, the dynamics of upper trophic levels (e.g. Atlantic cod) seem to have been driven by availability of food (capelin) and fishing (DFO 2012, Buren *et al.,* submitted). However, the influence of ice dynamics on ecosystem trends is not observed in the Flemish Cap ecosystem (NAFO 2011). Besides the impact of fishing, environmental drivers seem to be influencing recruitment success, while predation by top predators appears to regulate the dynamics of juvenile and smaller fishes here (Perez-Rodriguez *et al.* 2013). Strong trophic interactions also link the core species (cod, redfish and shrimp) in the Flemish Cap ecosystem (NAFO 2011, 2012a). The above highlights that there are analyses and information available to produce strategic/broad-based descriptions of ecosystem organization and dynamics that could provide managers/decision makers with a more functional and holistic perspective of the ecosystems that are potentially affected by oil and gas development.	Text has been added / edited as requested to discuss this further. We have utilized the references suggested, where these could be identified (by author name and date alone) and obtained.

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S14 **§4.2.1 Fish and Fish Habitat, pg 160 –**	
• The SEA report provides a comprehensive review of the biology, ecology, distribution and general aspects of the life history of several relevant fish species inhabiting the Grand Bank and southern Labrador shelf. In general the data shown in the Figures and Tables are accurate and informative, and the references cited in the report are generally up to date, with a few exceptions. An interesting aspect of this report is the integrated approach used to describe fish habitat and how it varied temporally and spatially, including the interrelationships of the various trophic/ecological components.	Reviewer commentary, no revisions to the SEA Report is required to address.
• The SEA contains only partial survey information and exhibits a lack of understanding of the limitations of the DFO trawl surveys. It is notable that the SEA only considers research survey information from DFO, but not survey programs conducted by the European Union (EU), and/or some of its member states. These research surveys, focused	We have tried to express the limitations of DFO RV surveys both in space and in terms of the species they collect (see descriptions of benthic communities). NAFO data, while potentially useful and relevant remain unavailable to us to analyze in comprehensive or

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on the Flemish Cap, but also on the nose and tail of the Grand Bank, are routinely used by NAFO Scientific Council to assess fish stocks in the area, as well as ecosystem structure and interactions. Numerous NAFO documents and papers describe and analyze data from these surveys (e.g. NAFO 2010a; 2010b; 2011; 2012a; Perez-Rodriguez *et al.* 2011; 2012; Nogueira *et al.* 2013).	consistent fashion. We have, however, used (and added) information from relevant NAFO reports and other documents, which in many cases summarize this information, throughout the SEA Report.
• As part of the DFO Ecosystem Research Initiative (ERI) NEREUS Program, a grab sampling program was implemented in soft bottoms of the Grand Bank over 2007-2010 (e.g. DFO 2012; Gilkinson 2012). These results should be included in the SEA.	The results of the NEREUS program have been added to the description of benthos.
• An incomplete description and characterization of Vulnerable Marine Ecosystem (VME) indicator species exists in the SEA. Over the last 5-7 years, there has been increased research effort devoted to the identification, characterization, and mapping of Vulnerable Marine Ecosystem (VME) indicator species within the SEA study area. Most of this work has been done under the umbrella of NAFO, and through the NAFO Scientific Council (SC) Working Group on Ecosystem Approaches to Fisheries Management (WGEAFM; recently been renamed SC Working Group on Ecosystem Science and Assessment (WGESA)). Most of this work is not included or mentioned in the current SEA. Furthermore, some recent and relevant studies like Baillon et al. (2012) and Beazley et al. (2013) are referenced in the text, but absent in the references section, and some of their implications not included in the document. For example, Baillon's study documents the linkage between seapens (corals) and redfish larvae, and makes the case for seapen fields to be considered essential fish habitat for redfish. This potentially critical role of seapen fields for redfish is absent from Table 4.62 (overview of key groundfish species in the SEA area), and there is no mention of this linkage in Table 5.1. (fish and fish habitat potential environmental interactions).	As stated above, we have expanded our discussion of VME indicator species to include more recent information by NAFO. Baillon's conclusions have already been captured in the Corals and Sponges section where the importance of sea pen habitat to commercially important species is stated... *They provide structural complexity on the seafloor, thus creating refuge and foraging habitat for a variety of fish and invertebrates (Watanabe et al 2009; NAFO 2010) including those harvested commercially (Gilkinson and Edinger 2009; Baillon et al 2012). The provision of such habitat is reflected by the increased biodiversity associated with deep-sea corals and sponges (Buhl-Mortensen et al 2010; NAFO 2010; Beazley et al 2013).* As requested, we have also added the linkages of redfish to seapen fields in Table 4.62.
• It should be noted that sponge grounds are among the more abundant VME indicator species in the SEA Study Area, but little attention is paid to these in Table 5.1., including the impacts of potential spills on these large grounds of filter-feeding, habitat forming species. Spill simulations described in SEA also seem to focus on either shoreline/surface impacts or highlight that spills will drift east (beyond 50°W). No attempt to assess the impact of these trajectories on VMEs exists in the current SEA, even though potentially damaging biogenic essential fish habitat could have serious long term impacts on ecosystem productivity. This shortcoming should be addressed accordingly.	We have identified spills as a possible concern to sponges based on their ability to filter large volumes of water in Table 5.1. Oil spill trajectory conclusions are very much dependent on project-specific scenario details and therefore are not addressed in this document. Rather, they are expected during project specific EA exercises.

	REVIEW COMMENTS	WHERE / HOW ADDRESSED
	• Although corals and sponges have been the initial focus in the study of VMEs, many other taxa have been identified as VME indicator species. These include tube-dwelling anemones, erect bryozoans, and crinoids. Several physiographic features (e.g. seamounts, canyons, the Southeast shoal) have also been identified as VME elements because they contain (or are likely to contain) VMEs (NAFO 2012). These other VME components are not discussed in any detail in the SEA, nor is an assessment of the potential impact of oil and gas exploration/production on them considered. This shortcoming should be addressed accordingly.	We have added text in the coral section describing newer VME species including crinoids, sea pens, erect bryozoans and large sea squirts. Seamounts are brought forward in the ecologically sensitive areas section and in discussions of closed areas. They are not brought forward in the coral section as they are not explicitly defined based on the high densities of a single taxa (e.g. coral protection zones).
	• Many of the NAFO reports from the Scientific Council meetings since 2008, and reports from the SC WGEAFM (and references within), summarize most of the available information on VMEs in the SEA Study Area. These reports should be used in the SEA not just to describe what is known on VMEs, but also to inform/construct scenarios for spill simulation studies. The upcoming NAFO SC WGESA report (to be released in May 2014) will contain an updated summary on VMEs, as well as an analysis of adequacy for current NAFO VME closures. This report will also contain recent findings that suggest that VME areas may be linked to higher fish densities, highlighting the potential importance of these areas for overall ecosystem production.	Our review has drawn heavily on NAFO documents to describe VMEs and we have enhanced this description as requested (see above). However, we maintain that spill simulation scenarios are beyond the scope of this exercise and are intended to be conducted when spill scenarios can be identified for a specific project and location. We have also identified linkages of VMEs to elevated fish abundance in the coral, sponge and sea pen section.
	• Another important source of information that will be useful for preparation of the final version of the SEA is the report resulting from a Convention on Biological Diversity (CBD) Regional Workshop that took place in Montreal, on 24-28 March 2014 and was intended to facilitate the description of ecologically or biologically significant marine areas in the Northwest Atlantic. The international waters within the SEA study area were part of the area considered by this CBD workshop.	This report is not currently available.
S15	**§4.2.1.1 Approach and Key Data Sources, pg 160 –**	
	While the DFO annual trawl survey is an important aspect of fisheries management in the region, the Industry-DFO Collaborative Post-season Trap Survey for Snow Crab in Divisions 2J3KLOPs4R is noteworthy as well. This survey is conducted during the fall of the year with the same fixed stations sampled every year.	We chose to base our analysis using a standardized approach for consistency across species and spatial coverage. While the collaborative crab surveys have merit, they have a different spatial range than RV surveys. To clarify our justification for our approach we have revised the Approach and Key Data Sources section. We have also added a section in Ch 4 (Fisheries) that describes the DFO / Industry surveys in some detail.
	The role of plankton in nitrogen and carbon cycling is not well explained. The term “biological pump” is misused. It does not refer to benthic pelagic coupling (which is an important process and should be explained) but rather to the sequestration of biogenic carbon in the deep ocean. The description of the causal mechanisms of the spring bloom is	We have enhanced our description of nitrogen and carbon cycling as suggested. We believe we have already addressed the causal mechanisms of the spring bloom including stratification and light availability in the following paragraph...

	REVIEW COMMENTS	WHERE / HOW ADDRESSED
	incomplete. Onset of stratification and the interaction with light availability are key factors. These issues should be corrected.	*Light and nutrients fuel phytoplankton growth in the SEA Study Area waters (Harrison et al 2013). The interaction of these limiting resources results in a spring and fall bloom in the waters of the Northwest Atlantic. Spring blooms are caused when strengthening sunlight interacts with well-mixed, nutrient-rich surface waters. The dominant bloom in the Northwest Atlantic typically occurs in early spring, usually April or May (Maillet et al 2004; Harrison et al 2013), and is dissipated over the summer as nutrient levels are prevented from replenishing by the formation of the summer thermocline (Harrison et al 2013). Fall winds and cooler temperatures break down this thermocline, permitting nutrients to recharge and facilitate a second somewhat weaker bloom (Maillet et al 2004). The timing of blooms typically progress south to north, and in waters off Newfoundland, Fuentes-Yaco et al (2007) determined that the bloom moves northward at a rate of approximately one degree latitude per week. Interestingly, the timing of the bloom has occurred progressively later in Newfoundland waters, which is counter to that observed in other areas of the North Atlantic (Harrison et al 2013).*
S17	**§4.2.1.4 Plants and Macroalgae, pg 167 -**	
	Some aspects of macroalgal communities in the Study Area are missing from the SEA. Several types of macroalgae, in particular coralline algae, have depth distributions well in excess of 30 m. Urchin-kelp-coralline algae dynamics are an important determinant of hard substrate communities in our waters (Himmelman and Steele, 1971).	We have added urchin predation (highlighted in Himmelman and Steele 1971) as an important factor in kelp distribution and strengthened existing text that highlights coralline algae as a deepwater species.
S18	**§4.2.1.5 Benthic Communities, pg 168 -**	
	The coral data presented in the report (Fig 4.63-4.64) are still incomplete, and still appear to be limited to NAFO zones 3KLNO, leaving large areas in the north of the Study Area, and on the Flemish Cap, uncovered. Thus, the report does not mention the high abundance of black corals along the western margin of the Orphan Basin (locally known as Tobin's Point), for which the data were not presented. The authors should request data on corals and sponges on the northeast Newfoundland Shelf, the margins of the Orphan Basin, the Orphan Knoll, and the Flemish Cap from DFO, and revise Figure 4.70 accordingly.	Coral and sponge information was collated from NAFO and DFO. As the data were embedded in a variety of region-specific reports, we endeavoured to put together a concise but representative summary of important coral areas (eg Figure 4.71). At the beginning of the SEA process, all of DFO's coral data was requested and we plotted what was provided. The data were difficult to present, due to overlapping points and therefore we elected to display the distribution obtained from DFO trawl surveys in an area of relatively low density (previous Figure 4.70) to highlight the widespread distributions of these animals. We have tried to clarify the intent of figure 4.70 in the text. *Collectively, sea pens, soft corals, stony corals, and sponges are represented across the shelf, slopes and banks of the Study Area but are found at their highest densities along the slopes (Gilkinson and Edinger 2009; DFO 2010; NAFO 2010; Murillo et al 2011). This*

REVIEW COMMENTS	WHERE / HOW ADDRESSED
	widespread distribution is reflected from RV Survey sponge and coral data collected on the Grand Banks (Figure 4.70). We have corrected the omission of important black coral habitat at Tobin's Point by including it in the text and in the Figure
The authors have revised Figure 4.71 to correct the errors identified in the first draft. However, the authors should still contact DFO for more information on corals on the Orphan Knoll, for example.	We have requested this data from DFO, but as of the time of Draft #3 submission no response has been received. As noted above, the area of high black coral densities on Tobin's Point was added to the sensitive areas map (previous Figure 4.71).
S19 §4.2.1.5 Benthic Communities, pg 168 –	
• All Gilkinson and Edinger (2009) citations should be Gilkinson and Edinger (eds.) (2009).	Changed in references, but not changed as citation. Consistent format with other citations in document (ie, the bibliography is clear that these individuals are the editors of the document)
• As different types of benthic communities are sensitive to different types of disturbance, this should be discussed and summarized in a table for easy reference and decision-making.	We have added text that illustrates the variability in benthic community responses to disturbance. We have elected not to include a table as there is not complete knowledge of the full effects of oil and gas activities on all such taxa.
• Regarding the statement, *"…and DFO and NAFO RV surveys…"…visual assessments also poorly…"* What is meant by 'visual assessments' here?	Video and/or photographic assessments were being referred to. This has been clarified in the text.
• Regarding the statement, (bottom of page 168)"*It is also important to note that characterizations of benthic communities are also inevitably biased according to sampling method. For example, visual assessments often poorly assess infaunal communities whereas grabs may have challenges sampling communities over harder substrates*." It should also be noted that bottom trawls typically sample only a small fraction of resident benthos, and most often larger epibenthos.	The biases of trawls is now noted.
• The statement, "*Collectively, these studies confirm that benthic communities in the SEA Study Area are quite diverse compared to higher trophic levels, as well as being somewhat sensitive to anthropogenic effects…*", requires qualification. When speaking in terms of sand-dominated continental shelves, the global literature on fishing impacts in these habitats indicate that, in many cases, recovery can be relatively rapid (e.g. months). However, in deep-water slope environments inhabited by slow growing, long-lived corals and sponges, recovery could be measured in terms of decades in many cases, if not longer (Gilkinson and Edinger (eds.)(2009)).	We have removed reference to anthropogenic effects in the described sentence. Subsequently we highlight that anthropogenic effects on benthos are variable and support the statement with examples.
• Further to the statement, "*Perhaps the most holistic sampling was done on the Grand Banks as part of a series of*	Trawl by-catch was added to the list of sampling methods.

REVIEW COMMENTS	WHERE / HOW ADDRESSED
trawling impact studies (Prena et al. 1999; Kenchington et al. 2001)", it should be noted that these researchers used video and grabs (Kenchington et al 2001) and a benthic sled and trawl bycatch (Prena et al. 1999).	
• Table 4.58 – Some non-shellfish species (e.g., sea urchins, polychaetes, sponges etc.) are included in this table summarizing shellfish species. Add "Invertebrates" to title of the table.	Title changed as suggested.
• Table 4.58 – Regarding the statement, *"Spat settle primarily between August and November at depths of 10-15 m."*, it should be noted that they also settle in deep offshore water – primarily gravel, on Grand Bank (Gilkinson and Gagnon, 1991).	Text has been added / edited as requested
• Table 4.58 – Information on 'Pale Sea urchin' should reference Gagnon and Gilkinson (1994).	Already references Gilkinson et al 1998, which is a more current reference on this species and provides more relevant information on its ecology.
• Table 4.58 – Information on 'surf clam' is incorrect. Surfclams (*Spisula solidissima*) are mostly confined to warmer waters, which on Grand Bank, is the Tail of the Bank and Southeast Shoal. The species that is harvested commercially north-east of this area is the Arctic surfclam (*Mactromeris polynyma*), with only sporadic occurrences of *S. solidissima.*	We have based this information on that published by Ollerhead et al. We are happy to correct this if there are problems, but we would need a more recent and specific reference to justify the change.
• Table 4.58 – Information on Polychaete worms indicates that they occur on a variety of substrates. However, much of the Grand Bank is comprised of sandy sediments which support abundant and diverse populations (documented by Kenchington et al., 2001).	Text added as suggested. We also added text on *Prionospio steenstrupi* as it was the most common polychaete species observed on the Grand Bank (Kenchington et al 2001).
• The statement, "Studies to date indicate that, like fish, benthic assemblages respond to environmental variables such as depth, substrate and flow field (Houston and Haedrich 1984; Schneider et al. 1987).", requires addition of the following references related to Grand Banks benthos: Gilkinson and Gagnon, 1991; Gilkinson, 2013; Gale et al. (in press).	These references were added to the text as suggested. References needed for Gale et al in press
• Amphipod prey includes much more than just seaweed and phytoplankton. They have many diverse and ecologically important feeding modes. Many are scavengers and some are aggressive predators.	Alternate feeding modes were included.
• Polychaete information is not comprehensive. The available literature should be used to provide data on diet and ecological roles of these important members of the benthos.	Text has been added / edited as requested As stated above, text on *Prionospio steenstrupi* (the most abundant polychaete species) was also added.
• The statement, "Collectively, sea pens, soft corals, stony	Citations added as suggested.

	REVIEW COMMENTS	WHERE / HOW ADDRESSED
	corals, and sponges are represented across the shelf, slopes and banks of the Study Area but are found at their highest densities along the slopes, i.e. depths > 200 m.", requires addition of references Wareham and Edinger (2007); Wareham (2010).	Reference could not be found for Wareham 2010 and so this was not added.
	• The statement, "Sponges, in contrast are more widely distributed and high densities can be found along the eastern slopes of the Grand Banks, around the Flemish Cap and along the northern slopes of the SEA Area", requires a reference.	We have referenced a figure that identifies high density areas of sponges.
	• Table 4.61 – The final column of this table is difficult to read. The number of digits after the decimal is inconsistent and the information is center justified, both of which are inappropriate formats for displaying such data. A right justified and constant number of digits after the decimal (suggested one digit past the decimal to be sufficient for "summary" statistics where precision is unwarranted) are more appropriate.	Table changed as suggested
	• Figures 4.70 and 4.71 – The time period covered by the coral and sponge RV records should be stated in the figure titles.	The survey period (2000-2012) for the RV surveys was added to the caption of previous Fig 4.71. The areas from Figure 4.71 are derived from a variety of NAFO studies and are not necessarily specific to a common set of years.
S20	**§4.2.1.5 Benthic Communities, pg 169 –**	
	It is known that data is lacking for many area of this expansive area being described and it is understood that information summarized in the document is that which is available in the literature. It should be noted that the data provided by grab samples however would not necessarily be the best indicator of some species such as snow crab. Snow crab, especially large crab, would likely not be captured by this type of sampling method. This area is specifically mentioned as the Carson Canyon is a known (and important) commercial fishing ground for snow crab yet the document infers that benthic invertebrates are relatively low in biomass in this area.	A caveat was added to address this issue and the SEA Consultation Report (Appendix A) is referenced as evidence of the importance of Carson Canyon as a fishing area. See earlier comment and response (G)
S21	**§4.2.1.5 Benthic Communities, Table 4.58, pg 170 –**	
	It is suggested that the title of the table be "Overview of some Key Invertebrate Species…".	Title changed as suggested.
S22	**§4.2.1.6 Marine Fish, pg 184 -**	
	• Table 4.62 and 4.63 – Tables are listed alphabetically by species. The order of the species should be taxonomic to permit grouping of species into various logical ecological groups as such Table(s) 4.62 and 4.63 should be amended accordingly.	Taxonomic ordering would require that all readers understand the taxonomy of a species of interest. Consequently, we recommend that the current alphabetical order should be maintained.
	• Table 4.62 – There is a notable lack of the most recent publications describing feeding habits and distribution and abundance trends of the three wolffish species found in the	Citations added as suggested. Reference for Collins et al 2014 could not be found and

REVIEW COMMENTS	WHERE / HOW ADDRESSED
Study Area. The following references should be included in the descriptions for Atlantic Wolffish, Northern Wolffish, and Spotted Wolffish: Simpson *et al.* (2013); Collins *et al.* (2014).	therefore was not added.
• Table 4.62 – Atlantic Wolffish Habitat and Distribution – Wolffish are found over a variety of substrates (not just "hard clay bottom"), and at depths less than 25 m, and in excess of 250m.	Text changed as suggested based on information in references. "In the Newfoundland area, it occurs over a variety of substrates at depths of <100-400 m and bottom temperatures of -0.5 to 6.5°C (Kulka et al 2004; Simpson et al 2012)".
• Table 4.62 – That Atlantic Wolffish can be retained under SARA, unlike the other two wolffish species, deserves mention, even if this species is not "commercially significant".	Text has been added / edited as requested.
• Table 4.62 – The applicable population/designatable unit of Deepwater Redfish should be included in the section on the species.	Text has been added / edited as requested
• The applicable population/designatable unit of American Plaice should be included in the section on the species.	Text has been added / edited as requested
• The applicable population/designatable unit of Atlantic Cod should be included in the section on the species.	Text has been added / edited as requested
• Table 4.62 - It is important to note that many COSEWIC and SARA status' do not apply to the species as a whole, but rather to single or multiple populations. The applicable populations should be listed in this table.	Text has been added / edited as requested
• Table 4.62 – Include fish species as an important component of Cusk diet (Bowman et al. 2000). Also include that Cusk is monotypic species in the Northwest Atlantic.	Text has been added / edited as requested
• Table 4.62 – The statement, "A number of research initiatives have also characterized benthic communities on the Grand Banks (Schneider et al. 1987; Kenchington et al. 2001)", should include the following references Gilkinson, 2013; Gale et al. (in press). Gilkinson (2013) documents benthic communities over areas of the Grand Bank as part of the DFO NL NEREUS Ecosystem Research Initiative, which involved a 3-year grab sampling program during multispecies trawl surveys. Gale et al. (in press) describe seastar (Asteroidea) assemblages and habitat use over wide areas of the eastern Canadian continental shelf and slope based on DFO survey trawl bycatch records and ROV video.	Text has been added / edited as requested. Reference for Gale 2013 has been used instead of Gale et al in Press.
• Northern Wolffish – The statement "…occurs in Arctic seas on both sides of the North Atlantic Ocean" should be rewritten. Northern Wolffish occurs in both Arctic and Atlantic Oceans, as do other wolffish species – though no mention of this is made. The fact that Northern Wolffish is more pelagic than the other two species should also be	Text has been added / edited as requested

REVIEW COMMENTS	WHERE / HOW ADDRESSED
noted.	
• The statement that Northern Wolffish is distributed as a 'widespread self-assemblage', is incorrect. Northern Wolffish are mostly found along the shelf edge, not on the shelf.	Text has been added / edited as requested. Categorized as Grand Bank Shelf Assemblage
• It should be included that, in the past, redfish larvae dominated the ichthyoplankton in many parts of the SEA area (Serebryakov et al. 1987).	Text has been added / edited as requested
• The introduction of invasive species and changes to habitat and/or community structure should also be discussed in the context of cumulative effects.	This example was added to the cumulative effects section.
• The statement, "A total of four invertebrate taxa (snow crab, northern shrimp, pink striped shrimp, and shrimp Pandalus propinquis) were available from the Canadian Research Vessel surveys (Table 4.60)", requires clarification. These are the major commercial species; however many other non-commercial taxa have been processed using standardized protocols during RV surveys since 2005/2006. The point of availability is inaccurate.	Text has been added / edited as requested Data for the top four invertebrate taxa (snow crab, northern shrimp, pink striped shrimp, and shrimp *Pandalus propinquis*) observed is presented from the Canadian RV surveys (Table 4.60).
• Roughhead Grenadier – The reference Lorance et al. (2008) is relevant to the Northeast Atlantic only. A publication by Edinger et al. (2007) contains information on Roughhead Grenadier in NL waters. Specifically, it reports that Roughhead Grenadier were found in association with deep-sea corals, such as gorgonians, antipatharians, and soft corals at depths of 200-1000 m.	Text/citations changed as suggested.
• Roundnose Grenadier – The reference Lorance et al. (2008) is relevant to the Northeast Atlantic only. In the Northwest Atlantic, the species has been caught at depths less than 400 m. The data provided for NL comes from Parsons 1976. Newer information is available in Power and Maddock-Parsons (1998), and Kulka (2001). Most catches of this species occurred at depths of 900 m or more.	Text/citations changed as suggested. Used Edinger et al 2007 for depth distribution
• Spotted Wolffish – Spawning in late autumn and early winter was suggested by Templeman 1966. A more recent publication (Templeman 1986) suggested mid to late summer spawning (July-August-Sept).	Text/citations changed as suggested.
• White Hake – White Hake occur at depths much less than 200 m. On the western St. Pierre Bank, and southwest slope of the Grand Bank, they frequently occur at around 100 m (Han and Kulka 2007). Juvenile White Hake are commonly found inshore, and may even occupy estuaries. Reference to Longfin Hake (U. chesteri) is not appropriate.	Text/citations changed as suggested.
• White Hake – Not all juvenile White Hake are pelagic. The	Text changed to include "early" juveniles are pelagic as

REVIEW COMMENTS	WHERE / HOW ADDRESSED
juvenile stage of the life cycle is characterized by pelagic and (later) demersal components.	noted in Han and Kulka (2009)
• Winter Skate – Kelly and Hanson (2013) estimated that 40-70 egg cases are deposited each year. Also, cephalopods (squid) are an important component of the diet.	Text has been added / edited as requested
• Herring – The occurrence for this species has been recorded up to 450 m depth in multispecies surveys.	Text has been added / edited as requested
• Capelin – Capelin are found in 3NLOPs in spring RV surveys. Include 3K and 2J from fall RV surveys. Besides the RV trawl surveys, capelin distribution information is available from annual DFO acoustic surveys.	Text has been added / edited as requested
• Capelin – The information related to 'subsequently spent adults…' is incorrectly stated and cited. Spent females move out to deeper water after spawning on beaches/bottom sites. Those that survive eventually migrate to offshore feeding areas and likely aggregate with capelin that will be maturing and spawning next year. The timing, the route, and mechanisms used to migrate from coastal waters to offshore feeding areas have not been knowingly documented.	Text was removed and replaced with, "Capelin that spawn offshore on the Southeast Shoal in areas with warm bottom temperatures (>2°C) and appropriate spawning substrate (Carscadden et al 1989).
• Include cephalopods as a major component of the Shortfin Mako diet.	Text has been added / edited as requested
• Include reproduction of White Sharks via internal fertilization, with development characterized by aplacental viviparity (also known as ovoviviparity) with embryonic oophagy. See Saïdi et al. 2005.	Text has been added / edited as requested
• Table 4.64 – Capelin spawning on Southeast Shoal takes place in June, July. Capelin also spawn on the bottom in coastal waters.	Text has been added / edited as requested
• Table 4.64 – Capelin spawning time (cumulatively) on beaches and coastal bottom sites and the Southeast Shoal encompasses May, June, July, August.	Text has been added / edited as requested
• Table 4.64 – No corresponding footnote reference exists for superscript #4 (Atlantic Cod).	Reference numbering was changed to match information
• Table 4.64 – Sandlance spawning season is winter (December-March) not June–August as indicated in the table.	Text has been added / edited as requested
• Sandlance – Table 4.65 states Sandlance constitute 6% of RV catch while the text states they constitute 30%. This should be corrected accordingly.	. As noted in the text: "Percentages reflect composition of total catch and include finfish as well as crab and shrimp species. Values may differ from those presented in the text which reflect the composition of a specific taxonomic

REVIEW COMMENTS	WHERE / HOW ADDRESSED
	group (e.g. fishes only)."
• Sandlance – The report should include information regarding habitat usage of Sandlance, i.e., burrowing in substrate part of day; migrating vertically to feed; and no great distance migrations as they are closely associated with their habitat.	Text has been added / edited as requested
• Sandlance – It should be noted that inshore and offshore sandlance are two different species. The report should highlight which species is impacted by any proposed work.	Information is based on Grand Bank *Ammodytes dubius*. Inshore populations have not been mentioned in text.
• Atlantic Cod – Other than a line in one of the tables in this section of the report, there is no mention of Atlantic cod, despite the existence of a published Atlantic cod Recovery Potential Assessment in 2011 (DFO-CSAS).	Atlantic cod are described in detail in the SEA Report (Marine Fish section)
S23 **Tables 4.58, 4.62 & 4.63, pgs 170, 184 & 193 –**	
What is the criteria for a species to be commercially significant (or not) in Tables 4.58, 4.62 & 4.63? Several species listed in these tables are fished commercially (see Appendix F) but are noted as not being commercially significant in the region.	Commercial species status was changed in these tables to match those listed in the Commercial Fisheries sections of the Report (and Appendices)
S24 **§4.2.1.5 Benthic Communities, Figures 4.66, 4.67, 4.68, 4.69, pgs 176-179 –**	
The text referencing these figures could be more cautionary in nature considering the data is slightly dated. A known regime shift (as has been mentioned in the document) is occurring. Species distribution and abundance is changing.	We have added a cautionary note at the introduction of this section that states, "*It is important to consider recent trends and forecasts of shellfish abundance and distribution (e.g. crab) when evaluating the current knowledge of their distributions (Section 4.2.1.2)"*
S25 **§4.2.1.7 Fish Species at Risk, pg 218 -**	
The definition for Extirpated should include the text "*in the wild*" after "*but exists elsewhere*". It should be noted that a Recovery Strategy is required for species listed as Endangered or Threatened on Schedule 1 of SARA, while a Management Plan is required for species listed as Special Concern.	The suggested clause was added and the paragraph has been revised to clarify the difference between Recovery Strategies and Management Plans.
S26 **§4.2.1.7 Fish Species at Risk, Table 4.66, pg 224 -**	
• The population column of this table appears to list the range of the species and not the population names. The applicable population names for each species should be included in this table.	Text has been added / edited as requested
• American Eel is assessed under COSEWIC as Threatened.	Text has been added / edited as requested
• Spiny Dogfish is assessed under COSEWIC as Special Concern, not Threatened.	Text has been added / edited as requested
S27 **§4.2.1.8 Environmental Influences and Changes, pg 225 -**	

	REVIEW COMMENTS	WHERE / HOW ADDRESSED
	The section on Environmental Influence and Changes provides some useful information on climate change in regards to fish and invertebrates; however, the context needs to be improved with the addition of information of the role of the North Atlantic Oscillation (NAO) and more comprehensive text on climate change in general (either in the existing text or earlier in sections on the physical environmental setting).	This section already highlights both the NAO and climate change in the following two paragraphs: *"A key environmental driver in the North Atlantic has been the North Atlantic Oscillation (NAO), an atmospheric phenomenon that affects the movement of weather systems and currents in the region. In recent years it has fluctuated on decadal scales, and is strongly correlated with environmental variables such as sea surface temperature and rainfall (deYoung et al 2004). NAO oscillations have been linked to changes in stock health of shelf species (such as cod; Stige et al 2006) and deep water fish species (such as redfish; Devine and Haedrich 2011) and to plankton abundance and biomass (Greene and Pershing 2000; Pershing et al 2001; Head and Sameoto 2007). For example, changes to redfish abundance in the SEA Study Area vary with bottom temperature, sea surface temperature and NAO. These variables can, in turn, affect fecundity, growth and recruitment of redfish. Furthermore, changes to salinity can alter redfish larval survival and/or affect their plankton prey sources (Devine and Haedrich 2011). These effects can manifest in fish communities over years to decades.* *Studies have attempted to predict ocean conditions in the Northwest Atlantic under the climate warming scenarios expected in the coming years (Frank et al 1990; Drinkwater 2005). Models predict a general warming and freshening of shelf waters that will move fish distribution of some species northward (e.g. cod, crab), extend the summer use of SEA Study Area by pelagic migrants, enhance fish growth and production and alter migration patterns (Frank et al 1990; Drinkwater 2005). In addition to these direct temperature effects, climate warming is also expected to increase stratification and alter current circulation patterns. These changes could reduce the transport of nutrients to benthic food webs and favour pelagic production (Frank et al 1990). Due to the complexity of the ecosystem and the unpredictable nature of fishing intensity, however, the authors of these studies recognize the speculative nature of these predictions.* However, we have enhanced discussion of climate in the Physical Environment Section (See response to relevant "climate change" comments above)
.S28	**§4.2.1.9 Aquatic Invasive Species, pg 226** -	
	Table 4.67 – Green crab is also one of the few AIS which are known to destroy fish habitat (i.e., eelgrass), thereby	Text has been added / edited as requested

	REVIEW COMMENTS	WHERE / HOW ADDRESSED
	affecting recruitment of some species (e.g., Morris et al 2010).	
S29	**§4.2.1.10 Ecologically and Biologically Significant Areas (EBSAs), pg 227 -**	
	• The recent identification and description of additional EBSAs in the NL Shelves area (DFO 2013) is mentioned, but has not been adequately incorporated into this report. The data layers for these EBSAs can be provided upon request from DFO. Notably, The Orphan Spur EBSA, and possibly the edge of the Notre Dame Channel EBSA, overlap with the Study Area.	The text highlights all EBSAs within and in proximity to the SEA Study Area (Templeman 2007 and DFO 2013). Among these, Orphan Spur and the Notre Dame Channel EBSAs are described and plotted in the previous Figure 4.89.
	• Ecologically and Biologically Significant Areas (EBSAs) – Southeast Shoal and Tail of the Banks – It should also be noted here that the Southeast Shoal is an area with some of the highest (if not the highest) benthic biomasses recorded anywhere in the world due to the standing biomass of populations of the Arctic wedge clam, Mesodesma sp.	We have already noted high densities of *Mesodesma* sp in the text. Nonetheless, we have put greater emphasis on this fact based on the reference Hutcheson and Stewart (1994). However, without a specific reference (which has not been provided), we are unable to justify listing that the densities are some of the highest in the world.
S30	**§4.2.1.11 Other Ecologically Important Areas, pg 231 -**	
	• Figure 4.90 – Ecologically Important Areas Identified in the Orphan Basin SEA (2003). The color designation for the Orphan Basin area should be a darker shade to differentiate from the surrounding area.	Orphan Basin SEA area has been changed to grey shading.
	• Legends provide a color scheme for abundance/biomass/species richness in Figures 4.91-4.93. It is not indicated how these were derived. No units are shown.	Units have now been added to the Figure legends
S31	**Table 4.82 Important Bird Areas in Eastern NL Near the SEA Study Area, pg 273 -**	
	Harlequin Duck is listed as Special Concern in the *Species at Risk Act*, not Endangered.	The phrase "the endangered Harlequin Duck" has been replaced with "the Eastern population of Harlequin Duck (SARA: Special Concern)" or simply "Harlequin Duck" in Table 4.82 and elsewhere in the text.
S32	**§4.2.3 Marine Mammals and Sea Turtles, pg 282 -**	
	The maps of cetacean observations (Figures 4.110a and b) are a considerable improvement. Unfortunately, the symbols for humpback whale and North Atlantic Right Whale are difficult to distinguish – this separation is particularly important since the Right Whale is protected under SARA. The considerable spatial overlap between whale observations, especially along the shelf break, and current exploration leases is cause of concern. Furthermore, the number of observations is high enough that the authors should consider some sort of density analysis by area, to show the frequency of marine mammal observations by area. The authors might consider separating those species under SARA designation from other cetaceans. It would be nice to see a map of sea turtle observations like those produced for the cetaceans. Not sure if that would be	The difficulty in distinguishing individual cetacean observations is acknowledged; therefore, the authors have separated SARA-listed species onto a different Figure. Although the number of cetacean observations is high, it is not possible to provide density analysis based on DFO sightings data because the surveys are largely done on an opportunistic basis, not systematically. A discussion of the limitations of the data is provided in Section 4.2.3.6. Sea turtle and pinniped observations were not provided in the DFO sightings data, and so it is unfortunately not possible to produce similar maps for these taxa.

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	necessary for pinnipeds, which are much more common.	
S33	**§4.2.3 Marine Mammals and Sea Turtles, pg 282 -**	
	• Given the objectives of the SEA, the document is generally well written as it pertains to marine mammals. However, similar to other sections in the document, this text also lacks synthesis and integration of information from a trophic dynamics and changing marine environment perspective. Where possible this deficiency needs to be addressed (particularly in the case of threatened and endangered species).	Acknowledged; text has been added to address this deficiency as detailed in the responses to the following five bullet points (see below).
	• In either the Introductory paragraph on Mysticetes (4.2.3.1) or in the supporting tables under Foraging Strategy and Food Sources), additional text is required to emphasize that these species migrate into our waters to feed for a limited amount of time on relatively specific prey species that are densely aggregated with variable distribution and abundance. As the information is presented now, these key ecological factors do not receive the attention required.	Text has been added to the introductory paragraph of Section 4.2.3.1 to point out that the presence of baleen whales (and their prey) is temporally and geographically variable.
	• There is no mention in any of the tables or Introductory paragraphs for either Mysticetes or Odontocetes that most of these species have complex social structures and communication systems. Although group size is mentioned in the tables, this doesn't adequately highlight these important behavioral traits.	The introductory paragraphs for both toothed and baleen whales now includes a mention of their often complex social structures and reliance on acoustic communication.
	• The information on Pinnepeds (Section 4.2.3.3) needs to be expanded so that harp seals, hood seals and grey seals are treated separately in the summary table (i.e. in the same manner key whale species were addressed). Although there are similarities in the ecology of harps and hoods, there are enough differences that lumping both species together results in a summary table with content that is too general to be useful. The timing and use of ice habitat for whelping needs to be a focus for each of these two species. There is also a climate change aspect that should be presented and discussed (there is published literature on this topic as well as new information becoming available pers. comm. Garry Stenson). Note that a recent publication on satellite movements of hooded seals indicates that there is significant feeding along the shelf edge to the east of the 'Northeast Shelf Slope' EBSA (Anderson *et al.* 2012).	The use of the area east of the Northeast Shelf and Slope EBSA by hooded seals has been added to the Table Harp, hooded and grey seals have been separated out into individual summary tables, and information on timing and use of ice for harp and hooded seals has been expanded.
	• Note that there are likely harbour seals present along the southern shore of the Avalon Peninsula for most of the year in addition to the Bays along the south coast.	This information has been added to Section 4.2.3.3.
	• In March 2014 the Convention on Biological Diversity conducted a science advisory workshop to delineate EBSAs in the Northwest Atlantic Area, including areas beyond the 200mile limit. The shelf break area from the vicinity of	Noted. This information has been added to Section 4.2.3.6, including that proponents are encouraged o seek updated information on potentially forthcoming EBSAs in the Northwest Atlantic Area.

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	Lilly/Carson Canyon extending northward to approximately 48' N was identified as a potential EBSA and further emphasizes the biological importance of this slope habitat.	
S34	**§4.2.3 Marine Mammals and Sea Turtles, pg 282 -**	
	• It is important to note that many COSEWIC and SARA statuses do not apply to the species as a whole, but rather to single or multiple populations. The applicable populations should be listed in this table.	Acknowledged. Applicable populations have been added to the species information tables.
	• The Western North Atlantic population of Humpback Whale is listed as Special Concern on Schedule 3 of SARA, not Schedule 1. Schedules 2 and 3 were created to identify species that were remaining to be reassessed by COSEWIC using their revised criteria when SARA came into effect.	Schedule 1" in the Table has been corrected to "Schedule 3".
	• The correct name for the population of Blue Whale is Atlantic population. Perhaps the author is referring to the Western North Atlantic stock.	Western North Atlantic population" has been amended to read "Western North Atlantic stock" in the Table.
S35	**§4.2.4.1 Eastern Newfoundland Protected Areas, pg 304 –**	
	• Figure 4.111 (Marine and Coastal Parks etc.), pg 306. The inset map depicting the LOMA boundary is incorrect (should be clipped to the south coast and not encroach on the land). The SEA should reference this area.	Figure has been edited to address this issue. The PB/GB LOMA is referred to in Section 4.2.4.2
	• Figure 4.112 (Fisheries and Closure Areas off Eastern Newfoundland), pg 310. The Legend for Fishery Closure Areas has an error. Item 5 (Corner Seamounts) is in fact Newfoundland Seamounts This same error also occurs on Figure 6.2 Summary of Sensitive and Special Areas.	Figures edited to address this issue.
S36	**§4.2.4.2 Other Identified Important and Sensitive/Special Areas off Eastern Newfoundland, pg 311 -**	
	The last line refers to PB / GBLOMA should read PB/GB LOMA.	Text has been edited to address this issue
S37	**§4.3.3.1 Regional Economic Overview, pg 318 – Zone 18.**	
	Paragraph uses the term seafood producer when all other references to fish plants have been as seafood processors. Suggestion to keep it consistent with others (processors).	Text has been edited to address this issue
S38	**§4.3.3.1 Regional Economic Overview, pg 318 –**	
	Fishing is mentioned in the regional descriptions for Economic Zones 14 and 18 but not in Zones 15, 16, 17 and 20?	Text has been edited to address this issue
S39	**§4.3.3.1 Regional Economic Overview, pg 319 – Zone 19 –**	
	"*Fishing harbours…limited seafood processing" capacity. As such, landed raw material is transported to seafood processing facilities in other areas*. (It is suggested that the text be inserted to provide a clearer indication of the level	Text has been edited to address this issue

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	of activity of the fishing industry).	
S40	**§4.3.4 Marine Fisheries, pg 323 -**	
	The entire section on marine fisheries should be redone to incorporate international fishing effort data. These data, in aggregated format, could be requested from the NAFO Secretariat. Note also that Campbell and Feridizon (2013) provide data for fishing vessel activity in the areas governed by NAFO for 2011 and 2012. Such information should be combined with the fishing effort information from DFO to provide a complete picture of fishing in the SEA area.	Additional fisheries data was requested from the NAFO Secretariat and that which was received has been added to the "international fisheries" section. The SEA does not – and cannot – seek to combine and reconcile the separate DFO and NAFO fisheries datasets.
S41	**§4.3.4.1 Data Areas and Sources, pg 323 -**	
	• Paragraph 1 reads - "Two regulatory jurisdictions related to marine fish and fisheries exist within the SEA Study Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within a 200 nautical mile limit and for benthic invertebrates (such as crab) across the entire continental shelf. Beyond that 200 mile limit, the North Atlantic Fisheries Organization (NAFO) manages groundfish activities and other resources (such as corals, for example)." It may be better to reflect the text of the NAFO Convention that refers to sedentary species rather than benthic invertebrates.	This text has been revised as suggested to address this issue (here and elsewhere in the SEA Report)
	• Commercial Fish Harvests (Quantities and Values) – should add 2013 data given significant changes in some quotas over that period.	The fisheries statistics included in the Draft SEA Report were the most current data available as of the time of writing. It has also been confirmed by DFO Statistical Services (Ottawa) that 2013 data are not available at this time, and September 2014 will be the likely release data for preliminary 2013 data.
	• Fishing Activity by Foreign Countries - more current data than 2011 should be requested from the NAFO Secretariat.	The SEA Report presents 2012 data, similar to that used for the domestic fisheries discussion (from the DFO datasets). Additional fisheries data was requested from the NAFO Secretariat and that which was received has been added to this section.
S42	**§4.3.4.2 Commercial Fisheries, pg 326 -**	
	The authors' argument that gridded data on fishing gear sets from DFO prevents them from completing a density analysis is probably not valid, but the gridded data format may require some additional effort.	The rationale for our not being able to complete the requested fishing density analysis (see Table of Concordance for Draft #1 comments) is accurate and entirely valid, and based on the nature and extent of the geospatial fishing data sets provided by DFO.
	In constructing the graphs, the authors should proofread for consistency – e.g. figures 4.133 and 4.134 do not use consistent symbols for gear types, even though the graphs are companion graphs of fish harvest weight and value by gear type.	These (like the previous charts) are pie charts that provide a general summary of overall fishing activity by gear type (main gear types by % of total weight or value). They do not use "symbols" for gear types – they use common and consistent colors to reflect the order of gear types by fish weight / value (e.g, blue is the highest, red is the next etc), for comparative purposes.
S43	**§4.3.4.2 Commercial Fisheries, pg 328 –**	
	It is suggested that a sentence or two be added in the	A sentence stating this has been added as requested

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	section on commercial harvest that the quantities of species landed are related to the quotas (Total Allowable Catch) set by DFO or NAFO and they can vary from year to year. It could be interpreted that species harvested at low levels (e.g. American plaice) are not very abundant in the region.	
S44	**§4.3.4.2 Commercial Fisheries, Table 4.119, pg 351 –**	
	Some of the fishery names in this table are a little misleading. (These names are probably taken from the DFO landings reports). Suggest changing a few names: Turbot – Greenland Halibut (not Flounder) and Groundfish (not Head – Probably turbot but would advise checking with DFO. The fishery is not directing Groundfish "Heads". There are likely two separate markets for "Heads" and a Head-off Turbot product. The whole Chapter used the term "Heads" and some clarity in this instance is suggested).	Yes, the fisheries data as presented throughout the SEA Report are based on the DFO fisheries datasets, and we have maintained the exact terminology used (including species names). After confirming with DFO – Statistical Services in Ottawa, we have changed "Turbot – Greenland Flounder" to "Turbot – Greenland Halibut" throughout. Response from DFO – Stats "As for groundfish heads, I've always been told that this consists primarily of Turbot heads. Like they stated, it obviously isn't a targeted species but rather a value added product of the Turbot fishery. " As this is an integral part of the DFO landings statistics (and thus, the total fisheries for the SEA study area), however, we have not removed this from the tables. We have, however, generalized this line item by calling it "Other", in order to preserve these values as part of the total reported landings (weight and value).
S45	**§4.3.4.3 Aquaculture, End of 1st line, pg 366 –**	
	Suggest using NL's seafood industry, not fishing industry.	This text has been revised as suggested to address this issue
S46	**§4.3.5.1 Marine Shipping and Transportation, 2nd para, pg 369 -**	
	Please delete "*Navigable Waters Protection Act*" from 2nd paragraph as it does not regulate harbours.	This text has been revised as suggested to address this issue
S47	**§5.1.1 Potential Environmental Interactions and Effects, 2nd bullet, pg 395 –**	
	Please include reproduction at the end of the comment (…migration, feeding, reproduction and other important activities). It is an "important activity" but worthy of specific mention.	This text has been revised as suggested to address this issue
S48	**§5.1.1 Potential Environmental Interactions and Effects, 6th bullet, pg 396 –**	
	The bullet, *"Changes in the presence, abundance, distribution and/or health of fish and invertebrates…"* is vague. Direct mortality of marine organisms (at various stages of development) resulting from exposure to oil spills should be stated explicitly instead.	This text has been revised as suggested to address this issue
S49	**§5.1.1 Potential Environmental Interactions and Effects, Table 5.1, pg 397 –**	
	Please add "alteration of migration/spawning activities" as a bullet under potential environmental interactions.	Text added in several places in the Table
S50	**§5.1.1 Potential Environmental Interactions and Effects, Table 5.1, pg 397 –**	
•	It should be noted that accidental spills of oils or other	The discussion of potential environmental interactions

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	substances onto the Southeast Shoal during the period capelin are spawning, eggs are incubating, and yolk sac larvae are in the sediment could have a negative impact on that year class and subsequent spawning biomass and related population level effects.	and effects identifies several mechanisms by which many lifestages of fish may be affected by spills. While the southeast shoal is a noted area of importance (see sensitive ecological areas section) these principles apply to fish in all areas. Thus we are reluctant lose the focus of this section, which is to identify the general interactions and effects.
	• Produced water effects should include increased nutrient loading and the ecosystem consequences for benthic pelagic coupling and production (Rivkin *et al.* 2000).	Added as requested
	• Tannen *et al.* (2nd line) is cited incorrectly. The effects found relate to increased oxygen demand not oxygen enrichment. Produced water effects in this section are related to discharge not flaring. Rye *et al.* (2003) is not in the list of references.	Trannum et al. 2010 information was corrected. Rye et al. (2003) was cited from its reference in Boertmann and Mosbech (2012). Therefore, we refer to the reader to the latter document.
S51	**§5.1.1 Potential Environmental Interactions and Effects, Table 5.1, pgs 398-399 –**	
	Reduced fish mortality due to presence of safety zone? This comment is not addressed in the summary section of the table. Please provide clarity of the comment.	A clarification was added in the table outlining that fishery exclusion zones can act as refugia from fishing related mortality.
S52	**§5.1.2 Environmental Mitigation Measures, pg 403 -**	
	Mitigations for ballast water introduction of invasive species are included, but not for fouling organisms on hulls, drilling rigs or equipment. Protocols for mitigation of these introduction vectors should also be included in this section.	Two mitigations were added to address AIS on drill rigs, ship hulls and equipment.
S53	**§5.1.3.1 Fish Species at Risk, pg 405 -**	
	The last paragraph in this is section indicates that Yellowtail Flounder is COSEWIC assessed, this is incorrect. Yellowtail Flounder has not been assessed by COSEWIC.	Yellowtail has been removed from this paragraph.
S54	**§5.1.3.2 Important Areas and Times for Fish and Fish Habitat, pg 405 –**	
	• It is indicated that the Southeast Shoal is a nursery for yellowtail flounder. However, it should also be acknowledged that the Southeast Shoal is the only spawning site for the Southeast Shoal capelin stock.	Added as suggested.
	• This study includes the spatial distribution of abundance indices for the three wolffish species; and potential spatial and temporal trajectories of oil spills have been modelled and/or simulated in previous studies (e.g. Net Environmental Benefit Analysis of Dispersant Use for Responding to Oil Spills from Oil and Gas Facilities on the Newfoundland Grand Banks, 2013); both sources of information could be used to assess the impact of oil spills on the wolffish populations components found in the Study Area and could also be used as a framework for identifying specific mitigation measures in the case of oil spills.	As stated above, oil spill modelling results are contingent on scenario specific conditions. Therefore, such modelling is beyond the scope of this document and is more typically addressed for project-specific EAs. The referenced report on dispersants is not available.
S55	**§5.2.3.2 Important Areas and Times for Migratory Birds, pg 415 -**	

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Mitigations should be developed to help make proactive avoidance and mitigation decisions for any activities that might affect migratory birds. The attraction of lights and flaring has been known to inadvertently harm, kill and/or disturb migratory birds. These issues and mitigations should be addressed in this section of the strategic environmental assessment. To assist in drafting this section, advice from EC-CWS regarding lights and flares is stated below.	Text regarding incidental take and permit requirements has been added to Section 5.2.1.
Migratory birds that come into contact with flares or collide with rig structures should be collected. A protocol for handling non-oiled but dead birds found on the vessel is attached (see **Attachment 8**). A permit will be required to implement this protocol and the proponent must be advised that such a permit must be in place prior to the initiation of proposed activities. Please note that *Migratory Birds Convention Act* permit applications can be obtained from EC-CWS via email at Permi.atl@ec.gc.ca.	
<u>Flaring Activities and Migratory Birds</u>	
Incineration or partial incineration of migratory birds has been known to occur during flaring activities. The harming, killing, disturbance or destruction of migratory birds as an unintentional consequence of human activities such as flaring is known as **incidental take** (please see http://www.ec.gc.ca/paom-itmb for more information concerning incidental take). Incidental take, in addition to harming individual birds, can have long-term consequences for migratory bird populations in Canada, especially through the cumulative effects of many different incidents.	Reference to these various mitigatve practices has been added to the Table and/or the associated text in Chapter 5
There is no permit to allow incidental take. It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.	
To minimize risk of incidental take of migratory birds during flaring activities, Environment Canada recommends, at minimum, the following beneficial management practices:	
• Flaring should not occur at any time if concentrations of migratory birds are at, near, or likely to become near the flaring apparatus.	
• Scheduled flaring activities should be avoided at night and during conditions of fog during the day.	
• When emergency flaring must occur during night and/or foggy conditions, EC recommend that flaring be undertaken in short bursts so as to reduce the chance of attracting migratory birds.	
• Should flaring be planned to proceed at night or in	

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foggy conditions, the proponent must address risks to nocturnally migrating birds and breeding seabirds. This must include: ○ the development of an avifauna management plan. In this avifauna management plan should be detailed what measures are to be used by the proponent to avoid incidental take of migratory birds; ○ a mortality monitoring plan which would include corrections for searcher efficiency, carcass persistence, and searchable area; and ○ investigation into the installation of flare shields to reduce light emissions and potentially reduce migratory bird mortality.	
Light Attraction and Migratory Birds	
In Atlantic Canada, nocturnal migrants and night-flying seabirds (e.g. storm-petrels) are the migratory birds most at risk of attraction to lights and flares. Attraction to lights at night or in poor visibility conditions during the day may result in collision with lit structures or their support structures, or with other migratory birds. Disoriented migratory birds are prone to circling light sources and may deplete their energy reserves and either die of exhaustion or be forced to land where they are at risk of depredation.	Reference to these various issues and mitigatve practices has been added to the Table and/or the associated text in Chapter 5
To minimize risk of incidental take of migratory birds due to human-induced light, Environment Canada recommends, at minimum, the following beneficial management practices:	
• The minimum amount of pilot warning and obstruction avoidance lighting should be used on tall structures.	
• The use of only strobe lights at night, at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada, is recommended.	
• Using the minimum number of lights possible is recommended.	
• The use of solid-burning or slow pulsing warning lights at night should be avoided.	
• Lights should completely turn off between flashes	
• Lighting for the safety of the employees should be shielded to shine down and only to where it is needed, without compromising safety.	

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The full effects of light attraction to migratory birds are poorly understood. In order to understand the full impacts of light attraction to migratory birds, proponents should be encouraged to monitor the attraction of seabirds to illumination produced on offshore structures using the results and/or mitigation procedures generated by on-going research conducted in Atlantic Canada and elsewhere in the world.	
More detailed Beneficial Management Practices concerning potential effects and mitigations related to light attraction and migratory birds are currently being developed by Environment Canada. Proponents should be encouraged to contact EC-CWS to obtain updated information.	
S56 §5.3 Marine Mammals and Sea Turtles (Effects Assessment), pg 417 –	
• This section of the document is generally well written as it pertains to marine mammals given the objectives of the SEA. However, it is noted the sections on Important Areas and Times for each of the key VEC species groups (e.g. Marine Mammals and Sea Turtles - 5.3.3.2) have considerable repetition from earlier sections of text. While some of this is warranted, there should also be an effort to link this information with the appropriate mitigation measures presented in each of the preceding sections of text.	The inherent repetition in Section 5.3.3.2 has been reduced, with reference back to the earlier discussion on important areas and times for marine mammals and turtles (Section 4.2.3.6). Similarly, in Section 5.2.3.2, repetition of text was replaced with reference back to Section 4.2.2.6.
• The risk from ingestion of floating debris (i.e. plastic bags) for turtles should be discussed and garbage management and onshore disposal proposed as mitigations.	This potential interaction has been added to Table 5.5, and mitigation added to Table 5.6.
S57 §5.4 Sensitive and Special Areas (Effects Assessment), pg 425 –	
• The effects of drilling wastes on sensitive and sessile benthic species such as corals and sponges are not well understood. However, since they are filter feeders and known to be sensitive to increased sedimentation, organic matter loading, and quality of suspended particulate material, it can be anticipated that they will be negatively affected. There is also very little information on the potential effects of seismic exploration on these organisms. These aspects should be highlighted as a critical information gap within this consideration of sensitive and special areas.	We have highlighted the lack of information regarding the sensitivity of many sessile organism to oil and gas activities in the "Information Availability, Requirements and Opportunities" section.
• This section implies that only designated VMEs and Coral Areas will be considered in this section. Other coral and sponge populations are only briefly referred to in the ecosystem overview and generally ignored in the assessment of potential effects. This should be addressed accordingly.	For obvious reasons, the "env planning considerations" are focused on particularly sensitive times and areas. As DFO and NAFO have spent considerable time and effort identifying sensitive ecological areas, it is prudent to incorporate such findings in this SEA Report. To address this comment we have added that coral and sponge populations are widespread throughout the SEA Study Area, but we maintain that planning considerations need to focus on particularly valuable areas and/or in

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		areas where considerable measures are already in place to protect species.
	• The Orphan Spur EBSA should be included in the list of EBSAs on p 426.	Orphan Spur has been added as requested.
	• In general, there are other EBSAs from the NL Shelves exercise that are in proximity to the SEA Study Area and that should be mentioned for the sake of completeness. It is done in other parts of the document but it's not consistent.	As we are discussing env planning considerations there is an emphasis on areas within the SEA Study Area. Nonetheless, we have identified that other EBSAs could be influenced through indirect interactions. The reader is referred to the previous Figure 4.89 for these EBSAs.
	• There wasn't an entry for the NL Shelves EBSA CSAS Report in the references. Correct Citation for this Publication: DFO. 2013. Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) within the Newfoundland and Labrador Shelves Bioregion. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/048.	This reference was cited and added to the citations list.
S58	**§5.6 Cumulative Environmental Effects, pg 431 -**	
	This section is superficial as presented. It is noted within the report that information on cumulative effects is undeveloped because upcoming projects and their footprints are unknown. However, there is also no attempt to describe how cumulative effects are currently being assessed nor is there acknowledgment and discussion regarding the advancements in cumulative effects research in recent years. These issues need to be addressed and the SEA amended accordingly.	Some additional information on "other projects and activities" in the SEA Study Area that may be relevant for future CEAs, as well as applicable methods for same, has been added to this section.
	Regarding the issue of unknown projects and unknown project footprint sizes as an explanation for providing no relevant industry information, it is noted that it is indicated elsewhere in the current SEA and on the C-NLOPB website that up to ten Environmental Assessments for petroleum exploration/production activities are in progress. At the very least, an overview and time line of these activities should be presented here to allow basis for potential cumulative effects/interactions between ongoing oil and gas activities.	
S59	**§5.7 Information Availability, Requirements and Opportunities, pg 432 -**	
	Coral and sponge effects and sensitivity should be identified as a significant information gap.	Text added as suggested.
S60	**§6.4 Sensitive and Special Areas, pg 439 -**	
	Figure 6.2 (previously mentioned error in name of Newfoundland Seamounts (not Corner Seamounts)). Also this map should include the previously mentioned EBSAs including Orphan Spur. These elements are included in a subsequent map in Section 6 Summary and Conclusions but should also be included in the relevant section of the document where these areas are being discussed.	EBSAs have not been added to Figure 6.2 to avoid clutter. However, the figure caption has been clarified to distinguish why EBSAs have not been included and the reader is directed to Figure 6.1 to see the location of EBSAs in the text. The Newfoundland Seamount label has been corrected.