

<u>Nova Scotia Department of Fisheries and Aquaculture's</u> <u>Report on Outcomes of Consultations for</u> <u>Lease and Licence AQ#1039</u>

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1.0 APPLICATION DESCRIPTION

Kelly Cove Salmon Limited (KCS) submitted an application on October 28, 2016, to pursue an adjudicative boundary amendment for site #1039, known as Rattling Beach. The amendment is to expand the boundaries of the issued lease space to encompass all aquaculture equipment and aquacultural produce (Figure 1a and 1b) that is currently present on site. The site is located in the waters known as Annapolis Basin, which are surrounded by the lands of Annapolis and Digby County, and is currently licenced to culture Atlantic salmon (*Salmo salar*), Atlantic Halibut (*Hippoglossus hippoglossus*), Atlantic cod (*Gadus morhua*), Rainbow trout (*Oncorhynchus mykiss*) and Haddock (*Melanogrammus aeglefinus*).



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 1a. Proposed adjudicative boundary amendment for lease #1039. Please refer to NSDFA's Site Mapping Tool at https://novascotia.ca/fish/aquaculture/site-mapping-tool/ for an interactive map showing the proposed boundary amendment.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 1b. Proposed adjudicative boundary amendment for lease #1039. Please refer to NSDFA's Site Mapping Tool at https://novascotia.ca/fish/aquaculture/site-mapping-tool/ for an interactive map showing the proposed boundary amendment.

2.0 CONSULTATION WITH MUNCIPAL, PROVINCIAL AND FEDERAL AGENCIES

The application was reviewed by the Municipal, Provincial and Federal agencies that are included in Table 1. These agencies provided advice based on their respective mandates to Nova Scotia Department of Fisheries and Aquaculture (NSDFA) on the proposed application. NSDFA worked with the applicant and the network agencies to respond to questions or comments regarding the application and to record any specific information, advice and recommendations relayed by the network agencies.

Agency	Network Agency
	Consultation
Fisheries and Oceans Canada - Maritime	See Appendix A
Canadian Food Inspection Agency	See Appendix B
Transport Canada	See Appendix C
Environment and Climate Change Canada – Canadian Shellfish Sanitation Program	See Appendix D
Environment and Climate Change Canada – Canadian Wildlife Service	See Appendix E
NS Department of Environment	See Appendix F
NS Department of Agriculture	See Appendix G
NS Municipal Affairs*	See Appendix H
NS Communities, Culture and Heritage	See Appendix I
NS Department of Lands and Forestry**	See Appendix J
NS Department of Fisheries and Aquaculture - Inland Fisheries	See Appendix K

Table 1: Municipal, Provincial and Federal Agencies who reviewed the application

*notification provided although a response was not required.

**at the time of the application submission this was still the Department of Natural Resources (DNR).

Summary of Network Consultations

The following are summaries of the individual network agency consultations NSDFA undertook regarding the adjudicative boundary amendment application for lease #1039. Please see the appendices outlined in Table 1 to review the associated documents related to each of the following network agency summaries.

Fisheries and Oceans Canada (DFO) reviewed the application according to their legislative mandate, which includes the *Fisheries Act, Species at Risk Act* (SARA), *Oceans Act* and applicable regulations. Some initial questions were raised in discussions by DFO requiring clarification from the applicant. These questions are outlined and addressed in KCS Addendum Report, which was provided to NSDFA and DFO for review. DFO completed its review and submitted a Letter of Advice (LOA) accompanied by a Canadian Science Advisory Secretariat (CSAS) Science Response. The LOA provided a summary of the results of DFO's risk assessment to inform of risks posed to fish and fish

habitat and identify where additional avoidance and mitigation measures could be applied.

Clarification was required/requested by NSDFA on DFO's LOA and CSAS response. DFO submitted a modified table with responses and also submitted an Addendum to the LOA that provide additional context related to site specifics and DFO's review process.

The application was reviewed by various DFO sections to assess the following: the deposit of deleterious substances, serious harm to fish or fish habitat, and the killing, harming or harassing of aquatic species listed under SARA and the destruction of their critical habitat.

The assessment by DFO was supported by a modelling exercise that described the "Predicted Exposure Zones for Deposits of Deleterious Substances". DFO's review was also supported by an assessment of "Fish and Fish Habitat" of the area based on their databases and expert knowledge to determine what fish and fish habitat were in the area and if it was susceptible to aquaculture effects. Finally, DFO looked at a number of "Pathways of Effects" that considered potential aquaculture related stressors and their potential effects on fish and fish habitat. These potential stressors included physical alteration of habitat structure, alteration in light, noise, release of nutrients and organic material, release of chemicals, release of farmed fish, and the release of pathogens and sea lice.

DFO determined that, because no critical habitat was identified in the predicted exposure zones, the Annapolis Basin and the proposed lease boundaries, it is unlikely that the residual negative effects will result in further serious harm to fish or fish habitat; or the killing, harming or harassing of aquatic species listed under SARA or the destruction of their critical habitat.

Based on DFO's assessment of the application; information, advice, and recommendations were provided to NSDFA which were considered by the department in a number of ways. DFO provided some recommendations which NSDFA referred to the applicant as information awareness recommendations for the applicant to consider to ensure they were compliant with DFO's legislated mandate. This was accomplished by providing DFO's letter of advice and associated documents to the applicant. DFO also provided advice and recommendations to the NSDFA regarding sections of the Marine Finfish Farm Management Plan (FMP). The FMP for licence/lease #1039 (which is currently approved for implementation) will be re-reviewed by NSDFA after a decision on the application is made by the Nova Scotia Aquaculture Review Board (NSARB). DFO did identify that information which will reside in the FMP may have informed a more precise assessment of the residual risk of the application. However, DFO advised that the information was not needed as the residual risk was below the thresholds of unacceptable impacts. If the application is approved, NSDFA will work with DFO to ensure the advice and recommendations provided are appropriately incorporated into the FMP for licence/lease #1039. NSDFA also considered the advice, recommendations and information provided by DFO directly into NSDFA's review and recommendations to the board.

Canadian Food Inspection Agency (CFIA) reviewed the application and did not raise any questions with the proposed operation regarding their mandate.

Transport Canada (TC) reviewed the application and identified concerns regarding the proximity to the ferry terminal and an expansion towards the terminal. NSDFA provided additional context and clarification to TC regarding the application and that the current configuration was not an expansion beyond what TC had reviewed through their Navigation Protection Program (NPP). TC confirmed with the applicant that the current gear configuration on site is what was approved in 2017 through TC's NPP and is currently marked accordingly. TC also followed up with the Princess of Acadia ferry operator and confirmed that there are no issues with the proposed amendment and no complaints had been received to date. TC concluded that there were no outstanding concerns with the proposed boundary amendment.

Environment and Climate Change Canada (ECCC) – Canadian Shellfish Sanitation Program (CSSP) reviewed this application and did not raise any questions with the proposed operation regarding their mandate. CSSP is not relevant to marine finfish applications.

Environment and Climate Change Canada (ECCC) - Canadian Wildlife Services Division (CWS) reviewed the application and had comments requiring clarification. The additional information requested by CWS was provided by the applicant and NSDFA. Upon review of the additional information, CWS determined that there were no further comments.

Based on CWS's assessment of the application; information, advice, and recommendations were provided to NSDFA which were considered by the department in a number of ways. CWS provided some recommendations NSDFA referred to the applicant, which were an information awareness recommendation for the applicant to consider to ensure they were compliant with CWS's legislated mandate. CWS also provided advice and recommendations, which NSDFA will incorporate into the FMP, as necessary. The FMP for licence/lease #1039 (which is currently approved for implementation) will be re-reviewed by NSDFA after a decision on the application is made by the NSARB. If the application is approved, NSDFA will work with CWS to ensure the advice and recommendations provided are appropriately incorporated into the FMP for licence/lease #1039. NSDFA also considered the advice, recommendations and information provided by CWS directly into NSDFA's review and recommendations to the board.

Nova Scotia Environment (NSE) reviewed the application and did not raise any questions or concerns with the proposed boundary amendment with regards to their mandate.

Nova Scotia Department of Agriculture reviewed the application and determined that due to the straightforward nature of the boundary amendment to the existing site, they did not have any concerns or objections with the application from an agricultural perspective.

Nova Scotia Communities, Culture and Heritage (CCH) reviewed the application and did not have any archaeological concerns as no gear, notably anchors, will be moved to support the boundary amendment. It is advised that if any archeological artifacts are recovered or observed at any time, a Coordinator of Special Places Program at CCH should be contacted. This can be accomplished by incorporating a Standard Operating Procedure (SOP) for reporting to CCH, into the applicant's FMP.

Nova Scotia Department of Lands and Forestry - formally Department of Natural Resources reviewed the application and noted that the proposed expansion lies within the Department of Natural Resources' designated Significant Habitat for overwintering wildfowl. However, the Department indicated that due to the limited extent of this development, it should not impact the biodiversity interests of the Significant Habitat area.

Nova Scotia Department of Fisheries and Aquaculture - Inland Fisheries Division reviewed the application but due to the marine environment where this site is located, the department did not have any concerns from and inland fisheries perspective.

3.0 SUMMARY OF CONSULTATIONS WITH THE MI'KMAQ OF NOVA SCOTIA

Nova Scotia Department of Fisheries and Aquaculture provided the application and associated documents to the Office of Aboriginal Affairs (OAA) for their review to provide advice to NSDFA on requirements regarding consultation with the Mi'kmaq of Nova Scotia. It was recommended that consultation with the Mi'kmaq was not necessary for the aquaculture boundary amendment application #1039 as no new equipment, species, harvesting methods, yield or structural change are associated with the proposal.

4.0 APPENDICIES OF NETWORK AGENCY CONSULTATION DOCUMENTATION

APPENDIX A – FISHERIES AND OCEANS CANADA

From: Winfield, Lynn
Sent: Tuesday, March 20, 2018 2:32 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <<u>Cheryl.Brooking@dfo-mpo.gc.ca</u>>; 'erin.laking@dfo-mpo.gc.ca'
<<u>erin.laking@dfo-mpo.gc.ca</u>>; 'philip.myers@inspection.gc.ca' <<u>philip.myers@inspection.gc.ca</u>>;
'david.macarthur@ec.gc.ca>; 'achel.gautreau@ec.gc.ca'
<<u>rachel.gautreau@ec.gc.ca</u>>
Subject: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca NS Department of Fisheries & Aquaculture Website

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R-1039 Amendment - Network Memo &



novascotia.ca

MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Fisheries and Oceans Canada. From: Winfield, Lynn
Sent: March 20, 2018 2:45 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Qynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Winfield, Lynn
Sent: May 3, 2018 10:38 AM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>; 'david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>; 'Angela.Smith@inspection.gc.ca>
<shane.hood@inspection.gc.ca' <shane.hood@inspection.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Rose-Quinn, Tammy [Tammy.Rose-Quinn@dfo-mpo.gc.ca]
Sent: June-29-18 3:52 PM
To: Richardson, Kate A; Goreham, Brennan CD
Cc: Laking, Erin
Subject: RE: Rattling Beach Site 1039

Good Afternoon Kate and Brennan,

I was wondering if you can help me out? We received the attached email from Cooke Aquaculture with the baseline survey report for the site noted above. I was wondering if this is the final report as it is my understanding that there is underwater video but the email did not contain this and we have not received anything via regular mail. I wasn't sure if you are planning to conduct a review of this document and then provide to us a completed package or are we to consider this the completed package? I will be away next week but feel free to email me and Erin and we will action this accordingly.

Thanks, Tammy **Tammy Rose-Quinn** Senior Advisor, Aquaculture Management Office Fisheries and Oceans Canada | Government of Canada <u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u> | Tel: (902) 448-5311 Conseillère Principale, Bureau de la Gestion de l'Aquaculture, Région des Maritimes Pêches et Océans Canada | Gouvernement du Canada <u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u> | Tél: (902) 448-5311 If you have received this communication by mistake, please notify the sender immediately and delete the communication without printing, copying or forwarding it. Thank you. Si vous avez reçu cette communication par erreur, veuillez en aviser l'expéditeur immédiatement et la supprimer sans l'imprimer, la copier, ou la faire suivre. Merci.

From: Goreham, Brennan CD [mailto:Brennan.Goreham@novascotia.ca]
Sent: June 29, 2018 3:58 PM
To: Rose-Quinn, Tammy; Richardson, Kate A
Cc: Laking, Erin; Feindel, Jessica A; Winfield, Lynn
Subject: RE: Rattling Beach Site 1039
Hi Tammy
Looping Jessica and Lynn Winfield (Licensing Coordinator) into this email. Jessica can perhaps speak to our planned review of the information. The remainder of the application was already sent some time ago

our planned review of the information. The remainder of the application was already sent some time ago (Lynn can confirm date and to whom) to DFO for review. The two should be reviewed in conjunction with one another.

Brennan Goreham Manager, Licensing and Leasing NS Department of Fisheries and Aquaculture 1575 Lake Road Shelburne, Nova Scotia BOT 1W0

Office: (902) 875-7430 Cell: (902) 874-2719 Fax: (902) 875-7429 Email: <u>brennan.goreham@novascotia.ca</u>

From: Rose-Quinn, Tammy [mailto:Tammy.Rose-Quinn@dfo-mpo.gc.ca]
Sent: Friday, June 29, 2018 3:59 PM
To: Goreham, Brennan CD < Brennan.Goreham@novascotia.ca>; Richardson, Kate A
<<u>Kate.Richardson@novascotia.ca</u>>

Cc: Laking, Erin <<u>Erin.Laking@dfo-mpo.gc.ca</u>>; Feindel, Jessica A <<u>Jessica.Feindel@novascotia.ca</u>>; Winfield, Lynn <Lynn.Winfield@novascotia.ca>

Subject: RE: Rattling Beach Site 1039

Agreed, right now I am more concerned with the baseline and whether or not this has been accepted by the province.

Tammy Rose-Quinn

Senior Advisor, Aquaculture Management Office Fisheries and Oceans Canada | Government of Canada <u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u> | Tel: (902) 448-5311 Conseillère Principale, Bureau de la Gestion de l'Aquaculture, Région des Maritimes Pêches et Océans Canada | Gouvernement du Canada <u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u> | Tél: (902) 448-5311

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From: Feindel, Jessica A [mailto:Jessica.Feindel@novascotia.ca] Sent: July 3, 2018 4:08 PM To: Rose-Quinn, Tammy Cc: Laking, Erin; Winfield, Lynn; Goreham, Brennan CD; Richardson, Kate A Subject: RE: Rattling Beach Site 1039 Hi Tammy, Kate is in the field this week; however I am able to address your inquiry. We have now received the complete package of NSDFA and presumably, DFO-AAR baseline information for the #1039 boundary amendment application. The recent submission of baseline information now means that the NSDFA baseline information requirements have been met. The second round of baseline information submitted did include additional video footage. My recommendation would be to request the video footage from Jennifer Hewitt and SIMCorp, otherwise we can burn the videos to a disc and put in the mail this week. Thanks for reaching out, Jessica From: Rose-Quinn, Tammy <Tammy.Rose-Quinn@dfo-mpo.gc.ca>

Sent: July 9, 2018 11:05 AM To: Feindel, Jessica A <Jessica.Feindel@novascotia.ca> Cc: Laking, Erin <Erin.Laking@dfo-mpo.gc.ca>; Winfield, Lynn <Lynn.Winfield@novascotia.ca>; Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>; Richardson, Kate A <Kate.Richardson@novascotia.ca> Subject: RE: Rattling Beach Site 1039

Thanks Jessica! I will contact SimCorp immediately.

Tammy

Tammy Rose-QuinnSenior Advisor, Aquaculture Management OfficeFisheries and Oceans Canada | Government of CanadaTammy.Rose-Quinn@dfo-mpo.gc.ca | Tel: (902) 448-5311Conseillère Principale, Bureau de la Gestion de l'Aquaculture, Région des MaritimesPêches et Océans Canada | Gouvernement du CanadaTammy.Rose-Quinn@dfo-mpo.gc.ca | Tél: (902) 448-5311

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From: Winfield, Lynn
Sent: August 16, 2018 10:48 AM
To: 'Rose-Quinn, Tammy' <<u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u>>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for the proposed amendment to Aquaculture finfish Licence and Lease #1039 in St. Mary's Bay, Digby County. Your comments are requested on or before September 6, 2018.

Sincerely,

Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Goreham, Brennan CD

From:	Jeff Nickerson <jnickerson@cookeaqua.com></jnickerson@cookeaqua.com>	
Sent:	February 12, 2019 1:32 PM	
То:	Goreham, Brennan CD	
Subject:	Accepted: Application Discussion (as per Bruce)	
-		

Goreham, Brennan CD

Subject:	Application Discussion (as per Bruce)
Location:	1800 Argyle Street 6th Floor
Start:	Wed 2019-02-20 9:00 AM
End:	Wed 2019-02-20 12:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Goreham, Brennan CD
Required Attendee	s Jeff Nickerson

Feindel, Nathaniel J

Subject: Location:	Confirmed: DFO-NSDFA-KCS Meeting RM-HLFX-WTCC-PSC-06FL-Brd-KMcNutt; RM-SHEL-NSCC-FA-01FL-Brd-1-VC
Start: End:	Wed 2019-02-20 9:00 AM Wed 2019-02-20 12:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer: Required Attendees:	Goreham, Brennan CD Hancock, Bruce H; Tammy' 'Rose-Quinn; Cusack, Roland R; Buchan, Carla M; Laking, Erin; Reid, Gregor Kyle; Feindel, Nathaniel J

Let's use 1-888-653-2299; 6704329 for those joining from outside Halifax

From: <u>@simcorp.ca</u> < <u>@simcorp.ca</u>>

Sent: April 9, 2019 11:32 AM

To: Tammy Rose-Quinn <<u>Tammy.Rose-Quinn@dfo-mpo.gc.ca</u>>; Goreham, Brennan CD <<u>Brennan.Goreham@novascotia.ca></u>

Cc: Jeff Nickerson <<u>inickerson@cookeaqua.com</u>>; Jennifer Hewitt <<u>@cookeaqua.com</u>>; Ted Weaire <u>@cookeaqua.com</u>>; Amanda Daigle <<u>@simcorp.ca</u>>; Bob Sweeney <<u>@simcorp.ca</u>>; Bob Sweeney

Subject: Rattling Beach Boundary Amendment - Addendum Report

Hello,

Please find attached an addendum to the NS1039 Rattling Beach - Boundary Amendment: Finfish Marine Aquaculture Development Plan submitted by Kelly Cove Salmon Ltd. in November 2017.

Tammy – Please indicate if your department requires a hard copy.

Feel free to contact me if you have any questions or concerns.

Best regards, Leah Lewis-McCrea, M.Sc., EP

Nova Scotia Division Manager; Sr. Laboratory Manager Sweeney International Marine Corp NRC-IMB Research Facilities 1411 Oxford St. Suite 367/368 Halifax, NS Canada B3H 3Z1

Tel:

Rattling Beach (#1039) Addendum_

*Please refer to Application Package AQ#1039, Section 3.0 - Applicant's Development Plan Addendum.

From: Parker, Edward V <<u>Edward.Parker@dfo-mpo.gc.ca</u>>
Sent: October 11, 2019 3:16 PM
To: Winfield, Lynn <<u>Lynn.Winfield@novascotia.ca</u>>
Cc: Ceschiutti, Robert <<u>Robert.Ceschiutti@novascotia.ca</u>>; Laking, Erin <<u>Erin.Laking@dfo-mpo.gc.ca</u>>;
Williams, Wendy <<u>Wendy.Williams@dfo-mpo.gc.ca</u>>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Lynn,

Please find attached DFO's letter of advice for the boundary expansion of Rattling Beach marine finfish aquaculture site 1039.

Thanks, Ed

Edward Parker Telephone | Téléphone 902-402-0298 Facsimile | Télécopieur 902-426-7967 <u>Edward.Parker@dfo-mpo.gc.ca</u> Fisheries and Oceans Canada | Pêches et Océans Canada PO Box 1006, P500, Dartmouth, NS B2Y 4A2 CP 1006, P500, Dartmouth, N-É B2Y 4A2 Government of Canada | Gouvernement du Canada

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Pêches et Océans Canada

1 Challenger Drive, P600 Dartmouth, NS B2Y 4A2

October 11, 2019

DFO File # 2018-MarAq-001

Lynn Winfield, Licensing Coordinator 1575 Lake Road Shelburne, Nova Scotia B0T 1W0

Dear Lynn Winfield:

Subject: Boundary Expansion of Rattling Beach Marine Finfish Aquaculture Site 1039 – Kelly Cove Salmon Ltd.

As requested, Fisheries and Oceans Canada (DFO) has completed its review of the application of Kelly Cove Salmon Ltd., a subsidiary of Cooke Aquaculture Inc., for an amendment to its aquaculture licence under the provincial *Fisheries and Coastal Resources Act*. Kelly Cove Salmon Ltd. is requesting to amend their licence to reflect a change of the boundaries from 8.74 hectares to 29.08 hectares at their existing site near Rattling Beach, Annapolis Basin, Digby County, for the purpose of cultivating Atlantic salmon (Saint John River strain).

DFO's review consisted of the following:

- Email from Lynn Winfield, Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture (NSDFA), dated March 20, 2018, titled, "Boundary Amendment Site 1039 Annapolis Basin, Digby County" and attachments;
- Email from Jessica Feindel, Manager of Aquaculture Operations, NSDFA, dated May 5, 2018, titled, "RE: map of rattling beach", and attachment;
- Email from Jennifer Hewitt, Cooke Aquaculture Inc., dated July 9, 2018, titled, "FW: Rattling Beach Baseline Report Addendum" and attachment; and
- Email from Leah Lewis-McCrea, Sweeney International Management Corp., dated April 9, 2019, titled, "Rattling Beach Boundary Amendment Addendum Report".

In accordance with DFO's legislative mandate, which includes the *Fisheries Act*, *Species at Risk Act* (SARA), *Oceans Act* and applicable regulations, the application was reviewed by various DFO sectors to assess the deposit of deleterious substances; serious harm to fish or fish habitat; and the killing, harming or harassing of aquatic species listed under SARA and the destruction of their critical habitat. The following DFO sectors participated in the review: Ecosystem Management - Regulatory Review, Oceans Management Program, Resource and Aboriginal Fisheries Management, the Area Director's Office, and Science. The result of Science's review is a DFO Canadian Science Advisory Secretariat (CSAS) Science Response titled, "DFO Maritimes Region Review of Proposed Marine Finfish Aquaculture Boundary Amendment, Rattling Beach, Digby County, Nova Scotia" in Appendix A of this letter.

Canada

Predicted Exposure Zones for Deposits of Deleterious Substances:

With some exceptions, the *Aquaculture Activities Regulations* (AAR) apply to all aquaculture facilities in Canada which have a provincial or federal aquaculture licence and whose operations have the potential to deposit or permit the deposit of a deleterious substance into water frequented by fish, and whose activities may cause a harmful alteration, disruption or destruction of fish habitat or the death of fish by means other than fishing. The AAR regulate the deposit of three classes of deleterious substances: drugs whose sale is permitted or otherwise authorized, or whose importation is not prohibited, under the *Food and Drugs Act* ("drugs"); pest control products that are registered, or whose use is authorized, under the *Pest Control Products Act* ("pest control products"); and biochemical oxygen demanding matter. The term "predicted exposure zones" is a reference to modelled predictions of the dispersion of deleterious substances and the predicted areas where the effects of the deposited deleterious substance on fish and fish habitat might occur.

Predicted exposure zones for the three classes of deleterious substances authorized for deposit under the AAR were determined by DFO Science (see Appendix A). The proponent provided a predicted exposure zone for biochemical oxygen demanding matter, but not the other 2 classes of deleterious substances (as required by the AAR). The predicted exposure zone for biochemical oxygen demanding matter provided by the proponent was determined by DFO Science to be consistent with existing scientific prediction capabilities. The prediction suggests a potential for elevated sediment sulfide concentration, which is a measurement of the impact of biochemical oxygen demanding matter, under the net-pens, between the net-pens and 100-200 meters distance from the net-pens. DFO Science's predicted exposure zone for drugs is within 300 meters of the net-pens and for pest control products extends a distance in the order of kilometers beyond the netpens.

Fish and Fish Habitat:

DFO used its own databases and expert knowledge, and information provided by the proponent to determine the fish and fish habitat within the predicted exposure zones and other areas where effects might occur by the construction and operation of the aquaculture site. Much of the data, however, is of low spatial and temporal resolution and too sparse to give a robust indication of the seasonality and spatial distribution of fish and fish habitat in the predicted exposure zones and other areas where effects might occur. Despite these limitations with the data, DFO focused on fish and fish habitat susceptible to aquaculture effects, with particular focus on commercial, recreational and Aboriginal fisheries species, SARA-listed species and species assessed as endangered, threatened or of special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Three designatable units of Atlantic salmon and their habitats are within the predicted exposure zones, the Annapolis Basin and the proposed lease boundaries. Two of the designatable units are Southern Upland and Outer Bay of Fundy Atlantic salmon, are assessed as endangered by COSEWIC and have not yet been considered for listing under SARA by the Government of Canada. The other designatable unit is Inner Bay of Fundy Atlantic salmon, which is listed under SARA as endangered. No critical habitat for Inner Bay of Fundy Atlantic salmon is identified within the predicted exposure zones, the Annapolis Basin or the proposed lease boundaries.

American lobster, sea scallop, clam, haddock, Atlantic cod (southern population) (COSEWICendangered), winter flounder, sculpin, monkfish, cusk, pollock, white hake (Atlantic and Northern Gulf of St. Lawrence population) (COSEWIC-threatened), yellowtail flounder, cunner, Atlantic herring, striped bass (Bay of Fundy population) (COSEWIC-endangered), American eel (COSEWIC-threatened) and North Atlantic right whale (SARA-endangered) and their habitats are also within the predicted exposure zones and other areas where effects might occur by the construction and operation of the aquaculture site. For the fish on which DFO focused, no spawning grounds of any species and no critical habitats of SARA-listed species are within the predicted exposure zones and other areas where effects might occur by the construction and operation of the aquaculture site.

Pathways of Effects:

DFO used the guidance provided in the CSAS Document entitled *Pathways of Effects for Finfish and Shellfish Aquaculture* (DFO 2010) to establish cause-and-effect relationships by linking activities to potential stressors and the potential stressors to effects on fish and fish habitat, including SARA-listed species and their critical habitat. Effects were assessed with consideration of mitigations provided by the proponent. The risk assessment is summarized for each stressor category underlined below.

Physical Alteration of Habitat Structure

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to result in physical alteration of habitat structure of the water column and of the benthos due to the presence of the farmed fish and the infrastructure of the site, such as the mooring system, grid system and net-pens. The potential effects assessed in this stressor category include the following:

- change in water flow;
- change in habitat structure, cover and vegetation; and
- change in access to habitat/migration routes.

Ecosystem Management – Regulatory Review assessed the effects of this stressor category as unlikely to result in further serious harm to fish or fish habitat.

Alteration in Light

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to result in alteration in light due to shading caused by the farmed fish and aquaculture site infrastructure, and due to increased light levels caused by artificial illumination. The potential effects assessed in this stressor category include the following:

- change in primary productivity; and
- change in access to habitat/migration routes.

Ecosystem Management – Regulatory Review assessed the effects of this stressor category as unlikely to result in further serious harm to fish or fish habitat.

<u>Noise</u>

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to produce noise as a result of the use of acoustic deterrent devices, vessels, equipment and machinery for various day-to-day operations. The potential effects assessed in this stressor category include the following:

• change in access to habitat/migration routes; and

• change in wild fish health.

Ecosystem Management – Regulatory Review assessed the effects of vessels, equipment and machinery as unlikely to result in further serious harm to fish or fish habitat. In its assessment of acoustic deterrent devices, Ecosystem Management – Regulatory Review reviewed the proponent's Acoustic Deterrent Policy and recommends the proponent engage them prior to the use of acoustic deterrent devices to prevent contravention of section 35 of the *Fisheries Act* or sections 32 or 33 of SARA.

Release of Nutrients and Organic Material

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to release biochemical oxygen demanding matter in the form of nutrients and organic material through waste feed, feces, metabolic waste products and bio-fouling organisms. Under subsection 7(2) of the AAR, the proponent must take reasonable measures to minimize the deposit of fish feces and unconsumed feed, having regard to the factors set out in paragraphs 7(1)(a) to (c). Subparagraph 10(1)(b)(i) of the AAR restricts operators of marine finfish aquaculture sites from restocking if the mean concentration of free sulfide exceeds 3000 μ M. According to the proponent's predicted exposure zone for biochemical oxygen demanding matter there is a risk that the site could exceed this concentration limit. The potential effects assessed in this stressor category include the following:

- change in suspended sediment concentration;
- change in habitat structure, cover and vegetation;
- change in primary productivity;
- change in oxygen (benthic and water column);
- change in access to habitat/migration routes;
- change in substrate composition/geochemistry;
- change in food availability/food supply;
- change in wild fish populations/communities; and
- change in wild fish health.

DFO was unable to fully assess if the proponent would be meeting the condition set out in the AAR to take reasonable measures to mitigate risks of serious harm to fish outside the facility from the release of biochemical oxygen demanding matter through its operations. Potential mitigations in plans and procedures, such as the Biofouling Plan and Net Washing Plan, are referenced in the application and supporting documents but were not provided to DFO. It is DFO's understanding that these documents will form part of the proponent's Farm Management Plan required under the provincial *Aquaculture Management Regulations*. Prior to it being finalized, DFO recommends the proponent provides the Farm Management Plan to DFO for review in accordance with DFO's legislative mandate.

Release of Chemicals

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to result in the intentional or accidental deposit of chemicals into the marine environment. The potential effects assessed in this stressor category include the following:

- change in contaminant concentration (benthic and water column);
- change in wild fish populations/communities; and
- change in wild fish health.

Two of the three deleterious substances that are regulated under the AAR are chemicals: drugs and pest control products. DFO Science's predicted exposure zone for drugs is within 300 meters of the net-pens and for pest control products extends a distance in the order of kilometers beyond the net-pens. According to publically available records from 2016 and 2017 (see CSAS Science Response, Appendix A), Rattling Beach Marine Finfish Aquaculture Site 1039 used one drug, oxytetracycline, one time. DFO Science's assessment of the effects of drugs was not as complete as for pest control products due to scientific uncertainties.

DFO Science assessed the effects of the two pest control products approved by Health Canada at the time of its review: azamethiphos and hydrogen peroxide. DFO Science concluded that azamethiphos and hydrogen peroxide are unlikely to persist in the environment and, if used as per Health Canada's Pest Management regulatory guidelines, are unlikely to cause significant harm to non-target populations.

Under subsection 7(1) of the AAR, the proponent must, in depositing a drug or pest control product referred to in paragraph 2(a) or (b), take reasonable measures to minimize detriment to fish and fish habitat outside the facility, having regard to paragraphs 7(1)(a) to (c).

Mitigation of unauthorized deposits of deleterious substances such as, but not limited to, lubricants, fuels and disinfectants were not provided to DFO. A Spill Prevention and Response Plan and a Spill Prevention, Control and Countermeasure Plan are referenced in the application and supporting documents, but were not provided to DFO. DFO recommends the proponent to have a site-specific chemical spill response plan so that a spill can be responded to in a manner that minimizes impacts to fish, fish habitat and aquatic species at risk. Without seeing this plan, DFO cannot make any comment on its suitability.

Release of Farmed Fish

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to result in the release of farmed Atlantic salmon, also known as escapees. The potential effects assessed in this stressor category include the following:

- change in wild fish health;
- change in wild fish populations/communities;
- change in access to habitat; and
- change in food availability/food supply.

Escapees are known to occupy rivers 200 kilometers from Atlantic salmon marine aquaculture sites. The main threats to wild Atlantic salmon from escapees are changes in genetics from interbreeding, competition for food or breeding spaces, predator attraction and transmission of pathogens or parasites.

DFO was unable to assess the mitigation of effects from the release of farmed fish. Potential mitigations in plans and procedures, such as the Escape Response Plan and Escape and Response Procedures, are referenced in the application and supporting documents but were not provided to DFO. It is DFO's understanding that these documents will form part of the proponent's Farm Management Plan required under the provincial *Aquaculture Management Regulations*. Prior to it being finalized, DFO recommends the proponent provides the Farm Management Plan to DFO for

review in accordance with DFO's legislative mandate. Without seeing this plan, DFO cannot make any comment on its suitability.

Release of Pathogens and Sea Lice

Rattling Beach Marine Finfish Aquaculture Site 1039 has the potential to result in the release of pathogens and sea lice. The potential effects assessed in this stressor category include the following:

- change in wild fish populations/communities; and
- change in wild fish health.

The application and supporting documents identify many options to manage fish health and treat sea lice and state that options will be determined in collaboration with the proponent's Corporate Veterinarian and the provincial Chief Aquatic Animal Health Veterinarian. DFO recommends the proponent take into consideration the drugs and pest control products they are authorized to deposit pursuant the AAR and the conditions under which they may be deposited, including the reasonable measures to minimize detriment to fish and fish habitat outside the facility.

Additionally, Ecosystem Management – Regulatory Review recommends the following updates be made to the proponent's Wildlife Interaction Plan:

- Update section 1.1 to include the *Fisheries Act* requirements under sections 34.4, 35 and 36 (outside of the *Aquaculture Activities Regulations*) as part of the reference to federal legislation.
- Update section 3 to note that COSEWIC assesses the status of wildlife species but doesn't list species under SARA. Species are only listed by the Governor in Council.
- Update section 3 species lists for fish, marine mammals and turtles to include only species that are likely to be in the vicinity of the aquaculture site (e.g. could remove Sowerby's Beaked Whale that is typically a deep water species).
- Update the referenced materials document section to reflect that COSEWIC assessments do not add protections. SARA prohibitions, and the requirement to identify and protect critical habitat, add protections to aquatic species listed as endangered or threatened. As such, only the Inner Bay of Fundy Atlantic salmon is listed under SARA while the Outer Bay of Fundy and Southern Upland Atlantic salmon have been assessed by COSEWIC but not listed under SARA.

As noted previously, it is DFO's understanding that aquaculture licence applicants must submit to NSDFA the Farm Management Plan for review and approval in accordance with the provincial *Aquaculture Management Regulations* and it includes information related to mitigating effects on the environment. Some of the information could be related to sections 34.4, 35 and 36 of the federal *Fisheries Act*, the AAR and of SARA that we were unable to assess without seeing the document. To prevent provincial approval of the application for an aquaculture licence from leading to contravention of sections 34.4, 35 and 36 of the *Fisheries Act*, the AAR or of SARA, DFO and NSDFA should discuss aspects of the Farm Management Plan that fall under the mandate of DFO. We will be in contact with your department soon in regards to a collaborative approach to that end.

Because no critical habitat was identified in the predicted exposure zones, the Annapolis Basin and the proposed lease boundaries, it is unlikely that the residual negative effects will result in further

serious harm to fish or fish habitat; or the killing, harming or harassing of aquatic species listed under SARA or the destruction of their critical habitat.

The proponent should be advised that the movement of any live fish requires a licence from DFO pursuant to sections 55 and 56 of the *Fishery (General) Regulations* made under the federal *Fisheries Act.* To apply for an introductions and transfers license, the proponent should email NSITC.XMAR@dfo-mpo.gc.ca.

If you have any questions concerning this letter, or if DFO's understanding of the application is either incorrect, incomplete, or if there are changes to the application, please contact me either by telephone at 902-402-0298 or by email at Edward.Parker@dfo-mpo.gc.ca.

Sincerely,

Edward Parker Senior Advisor, Aquaculture Management Office Maritimes Region

cc: M. McLean, Ecosystem Management, DFO Maritimes

D. Surette, Southwest Nova Scotia Area Office, DFO Maritimes

J. Berthier, Resource and Aboriginal Fisheries Management, DFO Maritimes

M. Sullivan, Ecosystem Science, DFO Maritimes

G. Herbert, Oceans Management, DFO Maritimes

From: Winfield, Lynn
Sent: October 24, 2019 8:51 AM
To: Parker, Edward V <Edward.Parker@dfo-mpo.gc.ca>
Cc: Ceschiutti, Robert <Robert.Ceschiutti@novascotia.ca>; Laking, Erin <Erin.Laking@dfo-mpo.gc.ca>;
Williams, Wendy <Wendy.Williams@dfo-mpo.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good Morning Ed,

The letter of advice that was attached to your E-mail of October 11, 2019 references Appendix "A" (at the bottom of page 1), there is no Appendix is attached, can you please forward the referenced Appendix "A"?

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Parker, Edward V <Edward.Parker@dfo-mpo.gc.ca>
Sent: October 25, 2019 3:24 PM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Cc: Ceschiutti, Robert <Robert.Ceschiutti@novascotia.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

** EXTERNAL EMAIL / COURRIEL EXTERNE **

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Sorry Lynn,

Please find it attached.

Thanks, Ed

Edward Parker Telephone | Téléphone 902-402-0298 Facsimile | Télécopieur 902-426-7967 <u>Edward.Parker@dfo-mpo.gc.ca</u> Fisheries and Oceans Canada | Pêches et Océans Canada PO Box 1006, P500, Dartmouth, NS B2Y 4A2 CP 1006, P500, Dartmouth, N-É B2Y 4A2 Government of Canada | Gouvernement du Canada

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Fisheries and Oceans Canada

Ecosystems and Oceans Science Canada Sciences des écosystèmes

Pêches et Océans

et des océans

Maritimes Region

Canadian Science Advisory Secretariat Science Response 2019/nnn

DFO Maritimes Region Review of the Proposed Marine Finfish Aquaculture Boundary Amendment, Rattling Beach, Digby County, Nova Scotia

Context

Kelly Cove Salmon Ltd. has made an application to the Province of Nova Scotia to expand the boundaries at their existing site (#1039) near Rattling Beach, Digby County, Nova Scotia. As per the Canada-Nova Scotia Memorandum of Understanding on Aquaculture Development, the Nova Scotia Department of Fisheries and Aquaculture has forwarded this application to DFO for review and advice in relation to DFO's legislative mandate. DFO Science was asked to provide a review of the expected zone of influences of the expanded site, information on the species and habitat presence and use within the zone of influences, as well as possible benthic impacts to inform DFO's review. The location of the site is shown in Figure 1.



site expansion (top panel), and the Rattling Beach site labeled as 1039x (bottom panel). Based on a snapshot of aquaculture activities in the Annapolis Basin from the Nova Scotian Aquaculture Site Mapping Tool website: <u>https://novascotia.ca/fish/aquaculture/site-mapping-tool</u>. Maps retrieved on April 16, 2019.

To help inform DFO's review of this application, the Maritimes Regional Aquaculture Coordination Office asked DFO Science three questions:

Question 1. Based on the biological, physical and geochemical information submitted by the proponent, and the accepted use of approved aquaculture products for fish health treatments in the marine environment, what is the expected zone of influence/exposure, from the use of these products, by species in and around the proposed aquaculture site? Does the expected zone of influence extend beyond the boundaries of the aquaculture facility?

Question 2. What species and habitats, focusing on species at risk, key Commercial Recreational and Aboriginal (CRA) species and species vulnerable to aquaculture impacts, exist within this zone of influence (and the broader Bay)? How do these species utilize (i.e. spawning, migrating, feeding, etc.) this area (e.g. the zone of influence)? Are there any habitats within the zone of influence considered critical or valuable for these species? Specifically,



a. What time of the year and for what duration of time do the species noted above utilize the habitat within the zone of influence?

b. How do the impacts on these species from the proposed aquaculture site compare to impacts from other anthropogenic sources? Does the zone of influence overlap with these activities and if so, what are the consequences?"

Question 3. The proponent has used a depositional model to predict the benthic effects of the proposed aquaculture site. Are the predicted benthic effects, as demonstrated by the output of the depositional model used by the proponent, consistent with the scientific knowledge of the potential impact of this operation?

Maritimes Science staff worked together to generate a science response to these questions, and the results were peer reviewed through a Canadian Science Advisory Secretariat (CSAS) Science Response Process. This Science Response Report results from the Science Response Process of February 8, 2019, on the DFO Maritimes Region Review of the Proposed Marine Finfish Aquaculture Boundary Amendment, Rattling Beach, Digby County, Nova Scotia.

BACKGROUND

Kelly Cove Salmon Ltd. is requesting an amendment to the site boundaries at their existing site #1039 in Rattling Beach, Digby County, Nova Scotia, to change the configuration of the boundaries and increase the size. Kelly Cove Salmon is not requesting an increase in production nor additional cages on site.

Kelly Cove Salmon Ltd. Site #1039 is located on the western side of the Annapolis Basin, near the mouth of the Digby Gut channel in Digby County, Nova Scotia (Figure 1). The site is approximately 2.5 km north of Digby. Rattling Beach is located in the Annapolis Basin, along with seven marine shellfish and two other marine finfish aquaculture sites (Figure 1: right panel.

Supporting information was submitted to DFO for consideration in its review: 1) Nova Scotia Fisheries and Aquaculture Memorandum Regarding Aquaculture Amendment Application No. 1039 - Digby County Aquaculture Network Review, 2) Baseline Assessment Report for Site 1039 Rattling Beach, 3) Baseline Assessment Report Addendum for Site 1039 Rattling Beach, and 4) Kelly Cove Salmon Ltd. Baseline Assessment Videos.

DFO Maritimes is in the process of updating its aquaculture siting review process, as well as reviewing information concerning the use, fate and effects of aquaculture chemicals, models and approaches for predicting the exposure and influence of these chemicals and the approaches for assessing the distribution of coastal organisms and habitats of relevance to aquaculture siting. A review of the approach used by DFO to assess individual aquaculture site applications and site expansions in the Maritimes going forward, i.e., a framework review, is underway, but has not yet been completed. The review of this site application follows the draft framework.

ANALYSIS AND RESPONSE

Zones of Influence

Question 1. Based on the biological, physical and geochemical information submitted by the proponent, and the accepted use of approved aquaculture products for fish health treatments in the marine environment, what is the expected zone of influence/exposure, from the use of these

products, by species in and around the proposed aquaculture site? Does the expected zone of influence extend beyond the boundaries of the aquaculture facility?

Estimations of the exposure of the seabed to organic releases from the finfish farm operation require information concerning the farm layout, feeding practices and the near and far-field oceanographic conditions. The estimates are often also sensitive to some of the input assumptions. The main oceanographic inputs are information on the bathymetry, water current, and wave field.

The response to these questions has been organized into two parts. Part A is a brief summary and review of the input information relevant to an estimation of an exposure and influence zone, and Part B is a rough estimate the expected zone of exposure and influence based on the inputs and a review of the proponent's exposure zone estimate.

Part A: Summary and Review of Input Information

For the purposes of this document, and specifically for the purpose of considering potential exposure and influence zones, the input information has been organized into several subcategories including the location and layout of the site. Comments on the information provided to DFO Science for this review are included with the summary points.

Site Location

- The Rattling Beach site, site #1039, is located near the western shoreline of the Annapolis Basin at a location south of the Digby Ferry terminal and north of the town of Digby.
- The depth of water in the vicinity of the site varies from less than 4m near the western shoreline of the site to more than 20m in the eastern and northern portions of the proposed lease. Depths adjacent to the north and east of the proposed lease can be greater than 20 m and in the main channel to the north east of the site the depths exceed 30 m.
- Depending on the phase of the tides and the time of the year, the tidal range (difference between high tide and low tide) can be as small as 5.5 meters or as large as 8.4 meters.

Site Layout (Based on information contained in Winfield 2018)

- The individual net-pens are 100 m in circumference.
- The net-pens are contained in a mooring grid that consists of square grid cells with side lengths 49 m.
- The complete grid of net-pens is a 2 by 10 array so the outside dimensions of the netpen array are approximately 98 m (2×49m) by 490 m (10×49m)
- The depth of the net associated with the net-pens is approximately 8 m (SIMCorp 2018)
- The net-pen array appears to be located over a sloping bottom in which the depth increases by about 10-20 m in a cross-slope horizontal distance of about 200 m, i.e. from about 10 m on the western side of the net-pen array to about 20-30 m on its eastern side.
- The grow out period for the fish is 20-22 months.
- The maximum number of fish on the site is expected to be 660,000.
- The average harvest weight of fish is expected to be 6 kg.
- The maximum stocking density of fish is to be 25 kg/m³.
- The maximum biomass on this site is expected to be 3,504,000 kg.

Consistency Note: This maximum biomass is the number given in Table 2 of Winfield (2018). The number is comparable, i.e. within about 10%, to the following simple calculations based on numbers given in the memorandum.

- a) The stated maximum biomass (3,504,000 kg) is within 10% of the biomass (3,960,000 kg) calculated as the product of the maximum number of fish expected on the site (660,000) times the expected maximum size of each fish (6 kg). This difference could be related to different assumptions about fish mortality; the simple calculation did not include fish mortality.
- b) The volume of each net-pen implied by the maximum biomass is consistent with volume of a net-pen estimated by the dimensions of a net-pen. The volume of a net-pen based on the stated site maximum biomass and maximum stocking density is 7004 m³ (3,504,000 kg/25 kg/m³/20 net-pens). The estimated volume of a 100 m net-pen that has a net that hangs approximately 8 m below the sea surface is ca. 6350 m³ (V= π r²h and r=100/2 π).

Bathymetry

In general, available bathymetry for the near-shore regions in the vicinity of the site is neither well resolved nor documented on charts (Figure 2). Given that the site is near shore and detailed estimates of bottom exposure will be sensitive to the details of the bottom bathymetry, a lack of detailed bathymetry can influence the estimates of the exposure zone. This is often the situation in the near shore, and it will require time and resources to resolve.

The proponent's higher resolution data in the area of interest is, therefore, useful and confirms the general impression of a significant slope. Since the proponent's data has not been adjusted to chart datum, caution must be used in the interpretation of the bathymetry. In order to incorporate this data into a hydrodynamic model, the data would need to be referenced to the chart datum for the area.



Figure 2. Shaded seafloor relief, Bay of Fundy, sheet 6 (2011). Geological Survey of Canada, "A" Series Map 2179A, 2011, 1 sheet, <u>https://doi.org/10.4095/288683</u> (Open Access).

Water Currents

Water currents are an essential and critical input to estimations of the zone of exposure associated with the release of biological oxygen demand (BOD) organic matter, pesticides and drugs from any farm site.

Information on water currents available at the time of preparing this document include:

- The statistics generated by the proponent from a single current meter, a 600 Khz acoustic doppler current profiler (ADCP) that had been moored in the southern portion of the proposed lease area between June 29 and August 4 of 2016. The ADCP was configured to record current velocity within 1 m thick vertical increments beginning a few meters above the seabed (Winfield 2018). Analysis of the current meter data was based on summary plots provided.
- A four dimensional (x,y,z,t) hydrodynamic model was used by DFO staff to produce a preliminary simulation of approximately 18 months of hydrodynamic conditions in the region under consideration. The model domain encompasses the Bay of Fundy, Gulf of Maine and eastern Scotian Shelf. The model included bathymetry at a resolution of approximately 10-50 m in the Annapolis Basin area. It was forced with spatially and temporally variable winds, heatflux, and offshore tidal and residual sea level. It also included river runoff from the major rivers flowing into the Bay of Fundy. A more detailed description of the model is included in

Appendix 1. The model did not include freshwater inputs from rivers flowing into the Annapolis Basin (Bear, Annapolis and Moose Rivers). The model outputs have been compared to local observations within the model domain and include sea level time series, CTD profiles (i.e. temperature and salinity depth profiles), and SMART Buoy time. The model outputs compare favourably with the observations.

• The model output indicates spatial and seasonal (Figures 3 and 4) variation in the current within the geographic domain of the proposed lease and beyond.



Figure 3. Rose diagrams showing the direction of the predicted water current at 5 m above the seabed at the location of the proponent's moored ADCP for each month from August 1, 2015 to August 1, 2016. The current predictions are from the DFO implementation of the FVCOM model in the Annapolis Basin and surrounding Bay of Fundy area. The proponent's current record was for June 29 through August 4, 2016.



Figure 4. Rose diagrams showing the direction of the predicted water current at 5 m below the sea surface at the location of the proponent's moored ADCP for each month from August 1, 2015 to August 1, 2016. The current predictions are from the DFO implementation of the FVCOM model in the Annapolis Basin and surrounding Bay of Fundy area. The proponent's current record was for June 29 through August 4, 2016.

Based on the above information, the following has been concluded:

- The major axis of the water current in the vicinity of the proposed site is expected to be aligned with the local bathymetry and, hence, oriented primarily in a north-south direction. This expectation is consistent with the summaries of the current meter data provide by the proponent and with the outputs from the DFO model.
- There is significant vertical variation in the speed of the observed current with surface currents reaching greater speeds than mid-depth or bottom currents. This is consistent with the observations provided by the proponent and with the output generated by the DFO circulation model for the vicinity of the current meter.
- The currents are expected to exhibit significant spatial variation on the length scale of the farm, farm lease, and beyond given the spatial variation in the bathymetry. This is consistent with output from the DFO and other hydrodynamic models implemented for the area. A

single current meter record, such as that provided by the proponent, as required by regulators, is insufficient to indicate whether there is significant spatial variation in the current. The location of the proponent's current meter record is in the relatively shallow and flat southern portion of the lease domain and, given the expectation of spatial variation in the current, this record may not be representative of the full exposure and influence domain. The DFO model results suggest that the current speeds in the northern area of the lease, and in the area of the net-pens, are greater than in the southern area of the lease.

- The currents in the vicinity of the Rattling Beach site are expected to undergo seasonal variation. A one-year portion of the simulation of the current in the area generated using the DFO hydrodynamic model is consistent with this and suggests the magnitude of the seasonal variation in the maximum current can be as much as plus or minus 15%.
- The magnitude of the current within the vicinity of the site is expected to be in the tens of centimeters per second.
 - The time averaged mean current speeds generated from the ADCP current record range from 19.8 to 32.7 cm/s (Winfield 2018).
 - The modal current speeds generated from the ADCP current record ranged from 11.7 cm/s at 6 m above the bottom to 40.7 cm/s at 9 m above the bottom (Winfield 2018).
 - The maximum current speed recorded by the ADCP was 81 cm/s and increased from 51.6 cm/s near the bottom to 81 cm/s at a height of 10 m above the bottom (Winfield 2018). These magnitudes are qualitatively consistent with outputs from the DFO circulation model.
 - The modelled time average mean current speed at the ADCP location over the same time period ranges from 29.9 cm/s to 44.9 cm/s. These values are higher than the observed values 19.8 and 32.7 cm/s, therefore suggesting the circulation model is over-estimating the magnitude of the mean current speed at this location by about 10-15 cm/s. This may not be the case for the rest of the model domain but sufficient information is not available to conduct more extensive comparisons between model and currents in the area of interest.

Waves

The wave information provided in the report (Winfield 2018) is not particularly representative of the site. The wave amplitudes presented (from Jonesport Maine) are likely overestimates of the wave heights expected to be experienced at the site. Wave height in the Bay of Fundy is typically less than that in the Gulf of Maine (Swail et al. 2006, Li et al. 2015).

The waves entering the vicinity of the site from the Bay of Fundy should generally be quite damped relative to those in the Bay due to the narrow opening through Digby Gut and the strong water currents in the Gut that may act to dampen incoming waves. Wind waves generated within the Annapolis Basin will not be represented in the Jonesport data, and they will be of relatively small amplitude because the wind fetch is limited by the dimensions of the Annapolis Basin.

Temperature, Salinity and Vertical Stratification

The water temperature and salinity at the Rattling Beach site are expected to vary on at least tidal and seasonal time scales and are expected to be within a few degrees and a few practical salinity units of the general Bay of Fundy conditions.

The graphics provided by the proponent (Winfield 2018) showing temperature data from the Prince 5 station give an indication of Bay of Fundy conditions. The Prince 5 station is not

located within the Annapolis Basin; it is located across the Bay of Fundy to the east of Campobello Island, New Brunswick in about 90 m of open water. However, the Prince 5 data do illustrate the expectation for seasonal changes in the water temperature and salinity of order several degrees and several parts per thousand of salinity.

The specific temperature and salinity conditions within the Annapolis Basin and at the Rattling Beach site will differ somewhat from those at Prince 5. The temperatures recorded at the Rattling Beach farm site (Winfield 2018) indicate the farm site has a seasonal variation in temperatures as expected, with temperatures being colder in winter and warmer in summer and the seasonal range in temperature being of order 10°C. The Rattling Beach temperature record also indicates the water temperatures at Rattling Beach may be a few degrees colder that those at Prince 5 in the winter and a few degrees warmer in late summer-early fall. This is consistent with the site being in an enclosed basin with local temperature and salinity dynamics. The maximum low temperature shown for February – March 2015 in the Rattling Beach record is consistent with a potential for winter chill or winter kill at the site.

A site in the Annapolis basin (north and east of the town of Digby: 44.6362°N and 6S.7442°W) was sampled from 16 December 1988 to 26 March 1994 on 105 occasions (Keizer et al. 1996). Water temperatures were sampled in the surface, mid-depth, and bottom, and ranged seasonally from a minimum of -0.11°C and a maximum of 17.5°C (see Table 6 in Keizer et al. 1996). Salinity also varied seasonally, with a minimum of 31 psu in March through April, and 33 psu in September for the bottom (Keizer et al. 1996).

Vertical stratification of the water column has the potential to affect the transport and dispersal of effluents released from the farm site since it limits the vertical transfer of momentum and substances that have weakly negative sinking rates.

The stratification in the vicinity of the farm site is expected to be weak since the current speeds are relatively large and the water depth is relatively shallow. The data in Keizer et al. 996 support this expectation.

Chemical Use

Consideration of exposure to chemicals has become an important consideration for regulators. Hence, in order to respond to the request for advice on the potential zone of exposure associated with approved aquaculture products for fish health treatments, a first order estimate of the potential zones of exposure and influence for potential chemical use by the farm operator has been made.

The Canadian commercial finfish aquaculture industry as a whole has been required to report on its use of chemicals since 2015, with 2016 being the first full year of reporting. During the 2016 and 2017 calendar years, nine approved chemicals were reported as having been used within Canada. As of the preparation of this document, only data for the 2016 and 2017 calendar years were available. Data for the 2018 calendar year were not available. Publicly available summaries of this data are available from the government of Canada Open Government Portal, specifically through the National Aquaculture Public Reporting Data website (https://open.canada.ca/data/en/dataset/288b6dc4-16dc-43cc-80a4-2a45b1f93383).

According to the above records, the Rattling Beach site has used only one of the chemicals included in the publicly available DFO summaries, and this was used in only one treatment, a treatment conducted in 2016. The chemical used was oxytetracycline. No bath or in-feed pesticides were used.

Pesticides

As noted above, the existing records indicate the Rattling Beach farm operation has not used pesticides and, hence, there has been no potential for the surrounding environment and ecosystem to be exposed to pesticides.

If the Rattling Beach were to use a bath pesticide in the future, there are, at present, only two pesticide active ingredients approved for use in bath treatments conducted in association with net-pens. These are hydrogen peroxide and azamethiphos. A brief description of these chemicals is given in Appendix E. Hydrogen peroxide and azamethiphos are unlikely to persist in the environment and, if used as per Health Canada's Pest Management regulatory guidelines, is unlikely to cause significant harm to non-target populations.

Drugs

As noted above, the existing records indicate the Rattling Beach farm operation has only used one drug, oxytetracycline, during the 2016 and 2017 calendar years. If the Rattling Beach farm operation were to use one or more drugs in the future, the drug may be one of the drugs that has already been reported as having been used in Canada in the 2016 and 2017 calendar years or listed by Fisheries and Oceans Canada on its web site referenced above. These potential drugs include the in-feed pesticides emamectin benzoate and ivermectin and the in-feed antibiotics oxytetracycline, florfenicol, erythromycin, ormetoprim and trimethoprim. Drugs such as lufeneron may be given to the fish while they are in the hatchery stage of production and residues may be released into the marine environment via excreted feces or exchange through the fish gills after the fish are transferred to the net-pens. A brief description of each pesticide and drug is given in Appendix E.

Part B: Estimation of Exposure Zones and Comments on the Proponents Estimates of Exposure Zones

Exposure to BOD

Spatial Extent of Exposure

Estimations of the exposure of the seabed to organic releases from the finfish farm operation require information concerning the farm layout, feeding practices and the near and far-field oceanographic conditions. The estimates are often also sensitive to some of the input assumptions. The main oceanographic inputs are information on the bathymetry, water current, and wave field.

Based on the limited available information and the considerations presented below, it is anticipated that the husbandry, bathymetry and water currents are the dominant factors affecting the exposure zones in the Rattling Beach area. Wave induced bottom resuspension is probably not a first order consideration in the estimation of benthic exposure zones in the vicinity of the Rattling Beach.

The proponent used AquaModel to estimate the zone of exposure associated with organic output from the proposed expansion. Their estimate is shown in Figure 4: top panel. As a consistency check for the proponent's output, a first order estimate of the expected benthic exposure to organic effluent from the Rattling Beach site was also made (Figure 4: bottom panel). The two estimates are similar, although as expected the first order estimate over-estimates the dimension of the exposure zone in the cross-isobath direction, i.e. the direction perpendicular to the shore.



Figure 5: Estimates of the spatial distribution of organic loading released from the proposed finfish expansion. The top panel is the estimate provided by the proponent using AquaModel and is Figure 3 in SIMCorp (2018). The open circles in the top panel indicate the location of the net-pens. The estimate is associated with an estimate of peak feeding. The bottom panel is the first order estimate described here. The yellow line indicated the perimeter of the first order estimate of the BOD exposure zone. It was generated by placing a circle with a radius of approximately 215 m (15 radius net-pen plus a 200m exposure radius) over the center of each net-pens shown in the Google Earth image and outlining the perimeter of the cumulative set of circles.

The first order estimate of the expected benthic exposure to organic effluent was based on the following assumptions and simple calculations (Table 1). The estimates of the size of the potential zone of exposure are based on the information discussed above in Part A and additional information introduced below.

- Although the sinking rate of fish feed varies, it is designed to sink at a reasonably consistent rate, so the fish have an adequate time to feed. For the following simple calculations, a fish feed sinking rate (w_s) of 0.1m/s and a fish faecal sinking rate of 0.01 m/s has been assumed.
- The water depth (*H*) has been assumed to be spatially and temporally constant and to be 15, 25, 30 or 60 m (Table 1).
- First order estimates of the sinking times have been estimated as H/w_s .
- First order estimates of the horizontal distances travelled by the sinking waste feed and faeces has been estimated as $(H/w_s)U$. The water depth, sinking rate and water current speed and direction have been assumed to be spatially and temporally constant.

The above calculations suggest that

- Waste fish feed pellets sink to the bottom within a few minutes (Table 1).
- Waste fish feed pellets could travel horizontal distances of 10s to a few hundred meters during their sinking time.
- Well-formed fish faeces sink to the bottom within a few tens of minutes to over an hour.
- Well-formed fish faeces could travel horizontal distances of 100s to a few thousands of meters, i.e. kilometers, during their sinking time. Faeces that are less well formed could take longer to sink to the bottom and could travel longer distances.
- Given that the exposure domain associated with feed waste and faeces is likely to be dominated by waste feed, and the feed sinks to the bottom before the deeper water is reached, the first order estimate of the potential benthic deposition exposure zone based on a maximum current of 81 cm/s and a depth of 25 m is conservatively a circle of radius about 200 m beyond the cage array (Figure 4) and more likely a curved ellipse with a major axis length scale of about 200 m (Table 1). As indicated in Figure 4, both the proponent and the first order estimates of exposure indicate a possibility of the exposure zone extending beyond the proposed site expansion boundary. The first order estimate likely over-estimates the eastward and westward extent of the exposure boundary.
- These length scales may be increased by benthic resuspension since the near bottom currents are reasonably strong at times.
- These sinking particle estimates of the extent of the exposure zone are relevant to both the potential for exposure to organic loading, drugs, and antibiotics since the drugs and antibiotics are administered as in-feed additives.
- The current meter data provided by the proponent and the outputs from the DFO circulation model both suggest that the exposure zone will be oriented parallel to the bathymetry with the exposure axes longer in the northerly direction than in the southerly direction.
- The DFO circulation model suggests that the orientation of the major axis of the exposure zone may vary by ±25° or so depending on the details of the current.

Table 1. First order estimates of the potential horizontal distances travelled by sinking particles such as waste feed pellets, fish faeces, and in-feed drugs released from the fish farm.

			Duration	Horizontal Distance Travelled		
Sinking Speed (m/s)	Water Depth (m)	Time to Sink to Bottom (min)	of Horizontal Transport (min)	Mean Depth Averaged Current 24 cm/s	Most Frequent Current 36 cm/s	Maximum Current 81 cm/s
Sinking Particles						
0.1 (feed)	15 (near-field low tide)	2.5	2.5	36	54	122
	25 (near-field high tide)	4.2	4.2	60	90	203
	30 (far-field low tide)	5.0	5.0	72	108	243
	60 (far-field high tide)	10.0	10.0	144	216	486
0.01 (faeces)	15 (near-field low tide)	25.0	25.0	360	540	1215
	25 (near-field high tide)	41.7	41.7	600	900	2025
	30 (far-field low tide)	50.0	50.0	720	1080	2430
	60 (far-field high tide)	100.0	100.0	1440	2160	4860

In the case of the Rattling Beach proposal, the proponent has provided some outputs from the AquaModel 2D simulations they have run (SIMCorp 2018). The model includes a salmon growth model and empirical specifications of the number and percentage of mortalities. Although a detailed examination and auditing of the proponent's model runs has not been conducted, the input parameters used to drive the proponents model runs are consistent with present scientific understanding of feed and faeces sinking rates, feed wastage rates, fish, and net pen size, background dissolved oxygen concentrations, etc. Although we did not find information in the provided documentation that specified the initial number of fish present in each cage, an estimate of the initial number of fish based on information provided in the proponent's documentation suggests the initial stocking numbers per cage are reasonable.

The first order estimate of the number of fish assumed to be initially placed into each net-pen is 33,000 (660,000 fish/20 net-pens) and is based on the proponent's specified expected maximum number of fish on the site and the assumption that these fish would be evenly distributed amongst the 20 net-pens on the site. Another consistency check is that the estimated stocking density based on the approximate weight of the fish at the time of stocking, is 0.78 kg/m³ (4950 kg/6350 m³) assuming a mean fish weight of 150 g, a total weight of fish in a net-pen of 4950 kg (150g/fish × 33,000 fish) and a net-pen volume of 6350 m³ (estimated in Part A) above). The mean weight of a fish at the time of stocking is based on the information provided by the proponent's Table 2 (SIMCorp 2018). This estimate of initial stocking density is

consistent with the initial stocking densities reported by the proponent in their Table 2 (SIMCorp 2018).

The proponent's model runs, which include an estimate of benthic resuspension, suggest that the benthic exposure zone for the sinking organics extends about 200 m beyond the proposed net-pen array. This is consistent with the first order estimates described above.

Both the proponent's and the first order estimates of the exposure zone assume the current is spatially homogeneous and seasonally consistent.

As already indicated, the currents in the vicinity of the Rattling Beach site are likely to be spatially and seasonally variable. The current speeds in the area where the transport and dispersal of the organic matter will occur are likely to be higher than those recorded by the current meter and used in the exposure zone estimates. The DFO model suggests the currents are likely to be higher in the late summer, i.e. September, and fall than in the June through August mooring period encompassed by the current meter mooring. These factors may result in an increase in the current speed in the order of 10% to perhaps 20%. Although the influence of this variation on the outputs from the proponent's model are difficult to assess in detail without running the model with spatially varying current field, it can be expected that, since the current directions are predominantly toward the area of higher velocity, the exposure zone estimates will increase to perhaps an order of about 300 m.

Intensity of Exposure to Organic Loading

In an effort to make a first order estimate of the expected intensity of benthic exposure to organic effluent from the Rattling Beach site, the following assumptions and simple calculations result in a flux of carbon to seabed of 10-20 g·C/m²/d.

- The horizontal surface area of the net-pens in use is 800 m²
- The area of benthic impact assuming no transport and dispersal of the feed is the same as the surface area of the net-pen.
- Assuming the number of fish in a net-pen is 30,000 (less than the 33,000 mentioned earlier to account for some mortality) and the mean weight of the each fish is 5 kg (less than the proposed maximum weight of 6 kg per fish), the biomass of fish in a net-pen is 150,000 kg.
- The total amount of feed introduced into a net-pen per day of is approximately 1500 kg, assuming the feeding rate for the fish is 1% of the body weight per day.
- Assuming a feed wastage rate of 2%, the flux of feed to the bottom would be 30 kg.
- Further assuming a carbon content for the feed of 50%, this feed wastage converts to a flux rate of 15 kg·C/m²/d.
- Assuming this carbon is spread over the area of the net-pen (800 m²), the average flux
 of carbon to the bottom is approximately 0.2kg or 20 g·C/m²/d.
- If the above calculations are repeated assuming the feed is spread over an area equivalent to a 120 m perimeter net cage (an estimate of some minimal spreading out of the waste feed), the flux of carbon to the bottom reduces to about 12 g·C/m²/d.
- In reality, the intensity of the exposures is expected to decrease as distance from the net-pen increases, and there should be some overlap between the exposure zones generated by each net-pen. The highest exposure intensities are, therefore, likely to be near the net-pen array, and the intensity of exposure should decrease with distance from the net pen to relatively low levels at a distance of a few hundred meters away from the cage array.

In the case of the Rattling Beach proposal, the proponent has provided some outputs from their running of the AquaModel. Unlike the above simple calculations, the model run includes the multiple daily releases that occur through the production cycle from multiple net-pens.

- The proponent's outputs seem to be consistent with the expectations based on the above simple calculations and do not seem to underestimate the deposition rate.
- The proponent's prediction of the benthic zone of exposure is based on the assumptions of a spatially and seasonally homogeneous current field. However, as acknowledged by the developers of AquaModel, the results are heavily impacted by the precision of the flow field incorporated into the model and that, for many farms, the use of a single current meter, i.e. a spatially homogeneous flow field, results in model outputs that are somewhat uncertain. As already indicated in Part A, the currents in the vicinity of the Rattling Beach site are likely to be spatially and seasonally variable. The influence of this variation on the outputs from the proponent's model are difficult to assess in detail without running a model that includes the spatial and seasonal variations. However, it is expected that the domain of the predicted exposure zones would be increased if this variability was incorporated.

Influence of Exposure to Organic Loading

Based on the above exposure considerations and the spatial distribution of natural resources in the area, it is not unreasonable to expect some of the lobsters, scallops and other organisms within the exposure zone will experience some degree of exposure to sinking organics. A 1 gC/m²/d flux of carbon to the bottom sediment corresponds to a sediment free sulfide concentration of 750 and a flux of 5 gC/m²/d corresponds to a sediment free sulfide concentration of 3,000 μ M (Hargrave 2010). Sediments with carbon fluxes below 1 gC/m²/d are considered to have a low effect on the sediment benthos, carbon fluxes above 5 gC/m²/d are likely to cause adverse decreases in sediment infauna diversity and carbon fluxes above 10 gC/m²/d correspond to sediment anoxia (Hargrave 2010, Table 2 below).

The proponent's model predictions (SIMCorp 2018), which are consistent with the simple calculations presented earlier, suggest the site expansion could result in carbon fluxes greater than 5 gC/m²/d. The combination of our simple estimates and the proponent's model outputs provided by the proponent (SIMCorp 2018) suggest that sediment sulfide concentrations will at times be sufficiently elevated that benthic macro-infauna diversity will be reduced within a zone that extends 100 to 200 m beyond the net-pen array and a bit beyond the northeast boundary of the lease (Table 2 below).

Table 2: Levels of carbon flux to bottom soft sediment and their corresponding levels of sediment free sulfide and qualitative effects on marine sediment bio-diversity (based on Hargrave 2010). A description of the proponent's depositional model results (SIMCorp 2018) is also provided.

Flux of Grams Carbon	Mean Sediment Sulfide	Sediment Classification in Terms of Sediment	Effect on Marine Sediment Macro In-	Proponent's AquaModel Prediction (gC/m²/d)		
(gC/m²/d)	(μM)	Oxygen	Faunal Bio- diversity	At time of peak feeding	At time of mean feeding	
<1	<750	Oxic A	Low effects	<1 gC/m ² /d occurs at more than 100 - 200m distance from the edge of cages	<1 gC/m ² /d occurs at more than 100 - 200m distance from the edge of cages	
1	750		Low effects			
	750- 1499	Oxic B	Low effects	edge of 1 gC/m ² /d contour within ~ 200,	edge of 1 gC/m ² /d contour within ~ 200,	
2.5	1500			~250 & ~150 m of	~250 & ~150 m of	
	1500- 2999	Hypoxic A	May be causing adverse effects	western, eastern, northern & southern edges of cage array, respectively	western, eastern, northern & southern edges of cage array, respectively	
5	3,000					
>5	3000- 4499	Hypoxic B	Likely causing adverse effects	>5 gC/m ² /d under cages and in area to northeast of cage array to just beyond	>5 gC/m ² /d under cages and in area to northeast of cage array to just beyond	
	4500- 5999	Hypoxic C	Causing adverse effects	the lease boundary	the lease boundary	
10	6000					
>10	>6 000	Anoxic	Causing severe damage	>10 gC/m ² /d under cages and in area to northeast of cage array to just beyond the lease boundary		

Cumulative Exposure to Organic Loading

There are seven marine shellfish and two other marine finfish aquaculture sites within the Annapolis Basin area (Winfield 2018). The Rattling Beach site expansion does not increase the total number of marine finfish aquaculture sites in the Annapolis Basin area, since the preexpansion site was already present (Figure 1). The distance between the sites is approximately 3 km based on estimates made from Google Earth imagery and Figure 1.

Estimates of cumulative exposures from multiple fish farms and other sources of organic loading have not been assessed in this report. However, given the location of the other two fish farms in the area and the water circulation within the Basin, an overlap between the benthic organic deposition zones associated with each of the farms is not expected, but an overlap of the pelagic exposure zones is more likely.

A waste water treatment plant is located 4.7 km to the south southeast of the boundary of the proposed site expansion. It is unlikely that the benthic exposure zone associated with the treatment plant overlaps the benthic zone associated with the site expansion.

Exposure to Chemicals

Pesticides

Scale of Exposure to Pesticides

Although pesticides have not been used at the Rattling Beach site in the recent past, an estimate of the scale of exposure if they were to be used is given in this section. The agency responsible for registering pesticides in Canada is the Health Canada Pest Management Regulatory Agency (PMRA). Before registering a pesticide, they try to anticipate the potential for a use pattern to expose sensitive organisms and prescribe in the use label associated with each pesticide the use restrictions that try to minimize potential impacts. The approach used here is based on that used by PMRA, DFO (2013), Page et al. (2014) and Page and Burridge (2014).

If hydrogen peroxide were to be used, the potential exposure zone associated with this chemical would have a length scale in the order of a few hundred meters from the edge of the site's netpen array. This estimate is based on the following considerations. The half-life of hydrogen peroxide (Appendix E) is much longer than the time needed to dilute the peroxide to below toxic levels since the dilution time is in the order of minutes to hours depending upon the species being affected, the measure of effect and the method of treatment. The time to dilute to the 1-h LC50 (lethal concentration required to kill 50% of the population) for lobster adults is 28 minutes when the treatment method used is a tarp. Over this time scale, the hydrogen peroxide could travel a distance of 432, 648 or 1458 m if it was carried by the mean, most frequent or maximum current (Table 2). These current speeds are based on the current meter record provided by the proponent. The maximum distances are unlikely to be realized since tarp treatments cannot be conducted in high current speeds, and the maximum current speed is does not persist for the full duration of the transport period.

If azamethiphos were to be used, the estimated potential exposure zone associated with this chemical would be the horizontal geographic domain encompassed within the boundary defined by a distance in the order of a few hundred meters to a kilometer from the edge of the site's netpen array. This estimate is based on the following considerations. Azamethiphos is highly soluble in water and, thus, is highly unlikely to bind to organics in suspension or in the sediment. The half-life of azamethiphos (Appendix E) is much longer than the time needed to dilute the azamethiphos to below toxic levels since the dilution time scale is of order minutes to hours depending upon the species being affected, the measure of effect and the treatment method. The time to dilute to the LC50 for lobster adults derived from 1-hour exposures to azamethiphos is about 30 minutes when the treatment method used is a tarp (Page et al. 2014). Over this time scale, the azamethiphos could travel a distance of 432, 648 or 1458 m if it was carried by the mean, most frequent or maximum current (Table 3). The time to dilute to the LC50 for stage I lobster larvae derived from 1-hour exposures to azamethiphos is about 5 hours when the treatment method used is a tarp (Page and Burridge 2014). Over this time scale, the azamethiphos could travel a distance of 4.3, 6.5 or 14.6 km if it was carried by the mean, most frequent or maximum current (Table 3). These current speeds are based on the current meter record provided by the proponent. The maximum distances are unlikely to be realized since tarp treatments cannot be conducted in high current speeds and the maximum current speed is does not persist for the full duration of the transport period.

The above exposure scales are consistent with the scale of near-surface drift estimated using the DFO circulation model of the area. Currents from the DFO circulation model were used with a particle tracking model to estimate the potential exposure zone. A total of 43,508 particles uniformly distributed among the cage array were release at a depth of 5 m for the surface. Particles were neutrally buoyant and kept at a constant 5 m depth from the surface. Current fields from the DFO circulation model of the area were used to advect the particles. No

dispersion was included. Particles were tracked for 5 hours, which is the time to dilute azamethiphos to the LC50 for stage I lobster larvae (Page and Burridge 2014). Results of the particle tracking model are shown in Figure 5.

The above distances for both hydrogen peroxide and azamethiphos are much less when the treatment is conducted within the well of a well-boat.

The scales of the estimated zones are such that the zones could extend beyond both the netpen array and the lease boundary. The exposures are expected to occur mainly in the pelagic zone, although the seabed in the shallow water adjacent to the proposed site might be exposed under some circumstances.

Table 3. First order estimates of the potential horizontal distances travelled by non-sinking particles such as pesticides released from the fish farm after a tarp bath treatment. The dilution time scales correspond to the time to dilute to different concentrations (see above text for details).

		Horizontal Distance Travelled			
Chemical	Dilution Time Scale (h)	Mean Depth Averaged Current 24 cm/s	Most Frequent Current 36 cm/s	Maximum Current 81 cm/s	
Hydrogen peroxide	0.5	432	648	1458	
Azamathinhas	0.5	432	648	1458	
Azametniphos	5	4320	6480	14580	



Figure 6. Estimate of the trajectories of particles (shown in blue), released from the proposed farm netpen array (shown in red), at a depth of 5 m below the surface tracked for 5 hours. The trajectories were produced using the current fields from the DFO implementation of the FVCOM model for the Annapolis Basin and Bay of Fundy areas. The yellow area is the overall region of interest for consideration of potential cumulative effects.

Intensity of Exposure to Pesticides

The intensity of exposure to bath pesticides varies with the concentration of the pesticide at the time of treatment, decreases with time and distance from the treatment location due to dilution, decay and behaviour of the pesticide.

The exposure zones estimated in the above section take the decay, behavior and dilution of the pesticide into consideration. The domain between the treatment location and the edge of the exposure domain is exposed at a sufficient intensity to result in the potential for lethal consequences to the sensitive organisms. Low concentrations of pesticide still exist beyond the estimated exposure scales, but these are estimated to be below the lethal limits assumed in the estimation of the exposure scale.

Influence of Exposure to Pesticides

Sea lice pesticides are toxic to primarily crustaceans (Table 4). Based on the above considerations and the estimated distribution of natural resources in the area, it is not unreasonable to expect that the planktonic zooplankton and larval phases of crustaceans, such as lobster located within a few hundred to a few thousand meters of the proposed site, could be exposed and impacted by an exposure to the bath treatments and the azamethiphos treatments in particular. There is a lower degree of expectation that the benthic crustaceans (e.g. lobsters, mysids) present within the shallow water located within a few hundred meters of the proposed site could be exposed and impacted by the bath treatments.

Table 4. Summary of the bath pesticides that could potentially be used by the Canadian aquaculture, and the class of organisms that are sensitive to the pesticide.

Chemical	Organisms Sensitive to the Chemical
Bath Treatments	
Hydrogen peroxide	crustaceans including zooplankton
Azamethiphos	crustaceans and molluscs

Cumulative Exposures to Pesticides

There are seven marine shellfish and two other marine finfish aquaculture sites within the Annapolis Basin area (Winfield 2018). The Rattling Beach site expansion does not increase the number of marine finfish aquaculture sites in the Annapolis Basin (Figure 1). The shellfish sites are not expected to release pesticides.

The potential for cumulative exposures to pesticides has not been considered in this document in any detail. However, the estimates of the exposure zones are expected to be robust to multiple treatments conducted on the same site. Estimates of cumulative exposures from the multiple fish farms and other potential sources of pesticide loading have not been fully assessed in this report, but the DFO model outputs in combination with the anticipated magnitude (approximately 1-15 km length scale depending upon the chemical) of exposure zones originating from the other fish farms sites suggest there could be overlap of the exposure zones associated with pesticide releases from any of the three fish farms in the area.

Drugs

Scale of Exposure to Drugs

Potential exposure and influence zones associated with the release of drugs by aquaculture operations in Canada are not well known and are the subject of active review and investigation both within Canada and internationally.

The exposure zone associated with drugs is expected to be smaller than that associated with pesticides. Drugs are administered as in-feed medications and, hence, environmental exposure to drugs occurs through wasted medicated feed, drug residues excreted in the faeces and perhaps through the gills.

The exposure zone associated with the release of drugs is assumed to be dominated by the waste of medicated feed and faeces. A reasonable first order estimate of the exposure zone of exposure may be the zone estimated for BOD. The exposure zone is, therefore, expected to be similar to that estimated for the release of organics. The estimated exposure zone for drugs is, therefore, within a few hundred meters of the net-pen array associated with the proposed site expansion. The initial deposition zones associated with the drugs may not be as extensive as those associated with regular feeding since BOD zones are estimated by assuming fish are usually fed one of more times per day throughout the production cycle whereas medicated feeds are applied much less frequently. Fish are fed medicated feed for only a few days at a time and for only a few treatment periods in the production cycle and, hence, the distribution of the medicated feed depends on the water velocities, drug quantities and feed wastage rates occurring during the treatment period(s).

Little empirical information exists concerning the spatial and temporal distribution of drugs released from marine aquaculture sites, although in-feed drugs have been found in sediments surrounding fish farms in some areas of the world. The only drug reported to have been used at the Rattling Beach farm, oxytetracycline, has been found in other areas where marine finfish farming takes place (e.g. Anderson, Haya and Burridge 2005). To our knowledge, no sediments from the Rattling Beach area have been sampled and analyzed for the presence of pesticides and/or drugs and sufficient information and consideration is not available whether the presence of the drugs, if used, would be expected in the marine sediments around the site.

Intensity of Exposure to Drugs

Work within the Federal government is being undertaken to develop approaches for estimating the intensity of exposure to drugs. This work is not yet complete and, hence, the intensity of a potential exposure to drugs has not been estimated. The proponent was not asked to make an estimate. However, as has been stated before, only one drug treatment has been reported for the Rattling Beach site for the years in which drug use has been reported, i.e. 2016 and 2017.

Influence of Exposure Drugs

Estimates of the influence of a potential exposure to drugs have not been estimated here or by the proponent; the proponent was not required to make this estimate. As outlined in Part A of this document and Table 5 below, the drugs available for use affect crustaceans, polychaetes, bacteria and parasitic worms. Antibiotics mentioned may induce anti-microbial resistance that may enter the food chain for some period of time depending upon the species (Armstrong et al. 2005). DFO Science is in the process of reviewing the potential for antibiotic impacts and is developing approaches to estimating the potential for an influence by these drugs.

Table 5. Summary of the in-feed drugs that are available for used by the Canadian finfish aquaculture sector and the class of organisms that are sensitive to the drug.

Chemical	Organisms Sensitive to the Chemical
In-Feed Pesticide	
Emamectin Benzoate	crustaceans, polychaetes
Ivermectin	crustaceans
Luefeneron	crustaceans
In-feed Antibiotic	
Erythromycin	bacteria
Florfenicol	bacteria
Oxytetracycline hydrochloride	bacteria
Praziquantel	parasitic worms
Sulfadimethoxine/Ormetoprim	bacteria
Trimethoprim/Sulfadiazine	bacteria

Cumulative Exposures to Drugs

There are seven marine shellfish and two other marine finfish aquaculture sites within the Annapolis Basin area (Winfield 2018). The Rattling Beach site does not increase the number of marine finfish aquaculture sites in the Annapolis Basin (Figure 1). The shellfish sites are not expected to release drugs.

The potential for cumulative exposures to drugs has not been considered in this document in any detail. However, the estimates of the exposure zones are expected to be robust to multiple treatments conducted on the same site. Estimates of cumulative exposures from the multiple fish farms and other potential sources of drug loading have not been assessed in this report. However, as in the case of organic deposition, it is expected that in absence of significant resuspension, there will be little overlap with potential exposure zones from the other farms. Other sources of pesticides and drugs have not been determined.

Species and Habitat Use

Question 2. What species and habitats, focusing on species at risk, key CRA species and species vulnerable to aquaculture impacts, exist within this zone of influence and the broader Bay? How do these species utilize (i.e. spawning, migrating, feeding, etc.) this area (e.g. the zone of influence)? Are there any habitats within the zone of influence considered critical or valuable for these species? Specifically,

a. What time of the year and for what duration of time do the species noted above utilize the habitat within the zone of influence?

b. How do the impacts on these species from the proposed aquaculture site compare to impacts from other anthropogenic sources? Does the zone of influence overlap with these activities and if so, what are the consequences?"

Methods

The proponent provided regional-scale information on a large number of species and habitats, including marine mammals, turtles, groundfish, pelagics, shellfish and other invertebrates, seaweeds, and birds. They also provided some recent information in the near vicinity of the site (SIMCorp 2016).

DFO Maritimes Science conducted a search of the literature and of Fisheries and Oceans regional databases to determine if other, more site-specific, information was available for this area as a complement to the information provided by the proponent, focusing on species at risk, key CRA species, and some limited information on species known to be vulnerable to impacts of aquaculture.

A polygon was created based upon the estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3. This polygon represents an estimate of the pelagic exposure zone associated with the release of a neutrally buoyant particle with a drift duration of five hours; a time scale consistent with the dilution or decay of the bath pesticide azamethiphos to its LC50. It is likely that this polygon is an estimate of the maximum zone of potential exposure and an over-estimate of the benthic exposure zone. The relative frequency of different species distributed within this polygon was obtained from the following databases:

- The Maritime Fishery Information System (MARFIS): MARFIS is a DFO database, managed by the Policy and Economics Branch, that houses information on the fisheries of the Maritimes Region. This fishery monitoring information represents a complete census of almost all commercial fishing activities.
- Industry Survey Database (ISDB): The at-sea monitoring information is maintained by DFO Maritimes Region. At-sea observers are also deployed on selected fishing activities to monitor and record events in greater detail than can be obtained from the submitted fishery monitoring documents.
- Sea scallop inshore survey: surveys are conducted annually and are used to provide advice on stock status to DFO Fisheries Management and industry stakeholders. For more information see Glass (2017).
- Whale sightings database: Most sightings are collected on an opportunistic basis and observations may come from individuals with a variety of expertise in marine mammal identification experiences. Most data have been gathered from platforms of opportunity that were vessel-based. The inherent problems with negative or positive reactions by cetaceans to the approach of such vessels have not yet been factored into the data. Sighting effort has not been quantified (i.e., the numbers cannot be used to estimate true species density or abundance for an area). Lack of sightings do not represent lack of species present in a particular area. Numbers sighted have not been verified (especially in light of the significant differences in detectability among species). For completeness, the data represent an amalgamation of sightings from a variety of years and seasons.

The database searches indicate that many species of interest have been and are likely present within the Annapolis Basin as a whole, within the proposed lease zone, and within the estimated zone of influence. Like much of the proponent's information, the data generated by the database search indicates that, for the most part, available data is of low spatial and temporal resolution and is too sparse to give a robust indication of the seasonality and spatial distribution of the species and habitats in the area of interest.

Information considered to be of particular relevance to the DFO review of this application are summarized below.

Species at Risk

Species listed under the *Species at Risk Act* (SARA), or assessed by COSEWIC, as endangered, threatened or of special concern and of relevance to the Maritimes Region are listed in Appendix B. The likelihood of these species occurring within the pelagic zone of

potential influence associated with the proposed aquaculture site expansion is also indicated. The sections below provide additional information on the species that have a possibility of occurrence within the zone of influence.

Atlantic Salmon

Information provided below on Atlantic Salmon (*Salmo salar*) is a synthesis of earlier science advice. For additional detail, readers are directed to the research documents published in support of the Recovery Potential Assessments for Southern Upland salmon (Bowlby et al. 2013, 2014) and Inner Bay of Fundy (IBOF) salmon (Amiro et al. 2008a,b, Gibson et al. 2008), the IBOF Recovery Strategy (DFO 2010), science responses on wild salmon populations in the vicinity of proposed finfish aquaculture development in St Mary's Bay (DFO 2011a) and Little Musquash Cove (DFO 2011b), science response on fish populations in the vicinity of three proposed finfish aquaculture sites in Shelbourne County (DFO 2012a), a research document on the pathway of effects of escaped aquaculture organisms or their reproductive material on natural ecosystems in Canada (Leggatt et al. 2010), and the most recent stock status update for salmon in the Maritimes Region (DFO 2017a).

Four Designatable Units (DUs) of Atlantic Salmon are identified in the Maritimes Region: Eastern Cape Breton (ECB), Nova Scotia Southern Upland, Outer Bay of Fundy (OBOF), and Inner Bay of Fundy (IBOF). The proposed aquaculture site expansion is located in the Southern Upland DU. Salmon from OBOF and IBOF populations move in and out of the Bay of Fundy and, therefore, have the potential to migrate in the vicinity of the proposed expansion site. The general Bay of Fundy area in the vicinity of the Annapolis Basin is considered to be used as a salmon migratory corridor and feeding ground in support of wild salmon growth, maturation, and post-spawning reconditioning.

IBOF salmon are listed as Endangered under Schedule 1 of SARA. IBOF salmon tend to migrate out along the New Brunswick side of the Bay of Fundy toward the outer Bay and Gulf of Maine (see Figure 1 of Lacroix 2012), but they are also detected on the Nova Scotia side of the outer Bay of Fundy. Some portion of individuals may leave the Bay of Fundy, over a period of approximately five months (June through October), but another portion may remain in the Bay of Fundy during this same period. Post-smolts that remain in the Bay of Fundy tend to move up into the Bay along the Nova Scotia side. They are also known to be present near the coastline and to move in and out of estuaries during this time period. Similarly, IBOF salmon kelts may be going near the mouth of Annapolis Bay (see Lacroix 2013 and Lacroix 2014). Returning adults from the IBOF, OBOF and Southern Upland DUs may pass near the proposed aquaculture site. Annapolis Basin is not part of the currently defined Critical Habitat for IBOF Salmon.

Outer Bay of Fundy and Southern Upland Atlantic Salmon have both been assessed as Endangered by COSEWIC, and are under consideration for listing under SARA by the Government of Canada. The Annapolis Basin contains two rivers that were previously known to be occupied by Southern Upland Salmon: the Annapolis River and Bear River. Historically, the population of Atlantic Salmon in the Annapolis River has been small, owing to a lack of suitable habitat, mostly available in tributaries such as the Nictaux River, covering a much smaller area than other Southern Upland Rivers (Bowlby et al. 2014). Atlantic Salmon were caught in the most recent (2008/2009) regional-wide electrofishing surveys of the Annapolis River in very low numbers, which corresponds to the general trend seen throughout the Southern Upland DU (Gibson et al. 2011). In this region-wide survey, salmon were detected on the Annapolis River (mean number per 100 m² =0.31 based on 7 sampling sites) but not on the Bear River (based on 1 sampling site) (Bowlby et al. 2013). In addition, the Clean Annapolis River Project did capture juvenile Atlantic salmon in an electrofishing survey of the Fales River subwatershed of the Annapolis system in the summer of 2018 (L. Cliche, pers comm). Wild Atlantic salmon populations can be affected by salmon aquaculture either by interaction in the immediate vicinity of the site or by the interactions of escaped aquaculture salmon with salmon in the wild (Leggatt et al. 2010). Escaped aquaculture salmon have been found in rivers at distances greater than 200 km from the nearest aquaculture site (Morris et al. 2008). Salmon aquaculture sites can potentially impact wild populations through the transmission of parasites, pathogens and disease from cage-farmed salmon; potentially increased predation as a result of predator attraction to the cage sites; and through an additional range of pathways that arise from aquaculture escapees (Leggatt et al. 2010). Escapees can hybridize with wild salmon, which has the potential to reduce genetic fitness of wild populations (Leggatt et al. 2010). A number of mitigation measures have been identified to reduce impacts from aquaculture activities on wild salmon populations (DFO 1999, Amiro et al. 2008b, Lacroix and Flemming 1998; DFO 1999, 2008, 2010; Gibson and Bowlby 2013; Clarke et al. 2014; Gibson and Levy 2014; Jones et al. 2014).

For inner Bay of Fundy Atlantic Salmon, survival at sea is low enough that populations are not currently self-sustaining. Increases in mortality in the marine environment are not likely to jeopardize the live gene bank programs being used to sustain the populations but would make it more difficult to meet the longer-term objective of restoring wild, self-sustaining populations. For Southern Upland and Outer Bay of Fundy Atlantic salmon populations, maximum reproductive rates are very low placing populations at risk of becoming extirpated. Increases in mortality for these populations increases this risk.

Atlantic and Northern Wolffish

Atlantic Wolffish (*Anarhichas lupus*) are listed as Special Concern and Northern Wolffish (*Anarhichas denticulatus*) are listed as Threatened under SARA. There are two ISDB records of Atlantic Wolffish from within the pelagic zone of potential influence (1996 and 2018). Atlantic Wolffish are often caught in DFO's RV survey in the Bay of Fundy (several catches in the 2018 survey, for example). The exposure of near-bottom organisms for much of this zone is likely to be limited and unlikely to have a detectable impact on these fish.

There are no records of Northern Wolffish in the zone of influence, as their distribution does not include the Bay of Fundy. They are found in the waters off of Nova Scotia, in the Gulf of St. Lawrence, around the island of Newfoundland, up the Labrador coast to Baffin Island. The preferred depth range of Northern Wolffish is 500-1000 m. The proposed aquaculture site is, therefore, unlikely to have an impact on these fish.

Shortnose and Atlantic Sturgeon

Shortnose Sturgeon (*Acipenser brevirostrum*) are listed as Special Concern under SARA. The Saint John River population tends to reside mainly in the river and estuary and is rarely observed in the marine environment of the Bay of Fundy. It is considered unlikely to be present within the zone of influence and, therefore, unlikely to be impacted by the proposed site expansion.

Atlantic Sturgeon (*Acipenser oxyrinchus*) is assessed as Threatened by COSEWIC. A spawning population of Atlantic Sturgeon is known to occur in the Saint John River. Adults spend much of their non-breeding time at sea where they can migrate over extensive distances along the coast while feeding. Atlantic Sturgeon have been observed in the Annapolis River, and elsewhere in the Bay of Fundy. They are likely to pass by the proposed aquaculture site expansion and through the zone of influence. The site expansion is unlikely to increase any potential impact on these fish.

White Shark

White Shark (*Carcharodon carcharias*) are listed as Endangered under SARA. Sightings and bycatch records encompass a large geographic area in Atlantic Canada: from the coast off northern Newfoundland, along the edge of the continental shelf, and into the Bay of Fundy. There has been consistent records of White sharks in the Bay of Fundy for the past three summers, including the Annapolis Basina area. Prior to this, there were no monitoring efforts and there were fewer tagged individuals.

In an analysis of potential mortality in Canadian waters, the greatest potential for fishery interactions, in terms of gear type, was considered to be coastal gill nets and weirs (DFO 2017b). In relation to other threats, COSEWIC (2006) identified that bioaccumulation of pollutants may adversely affect populations of White Shark, including the one in the North West Atlantic (COSEWIC 2006). Shark species accumulate toxins readily due to their high trophic position, life history characteristics (slow growth and longevity), and large, lipid-rich livers (Schlenk et al. 2005). Due to the transient nature of white sharks, it is considered unlikely that this aquaculture site would lead to significant effects on the White Shark population.

Leatherback Sea Turtle

Leatherback Sea Turtle (*Dermochelys coriacea*) are listed as Endangered under Schedule 1 of SARA. Leatherback Sea Turtles feed in high densities in the North Atlantic during the summer. When in Canada, leatherbacks can be found in coastal, shelf and offshore waters. The Bay of Fundy is not considered to be important habitat for Leatherback Sea Turtles and it hosts relatively few foraging leatherbacks during the summer and fall.

The threat of highest concern to Leatherback Sea Turtles in Atlantic Canadian waters is entanglement in fishing gear, which can cause lethal or sub-lethal injuries to a turtle. There are records of Leatherback Sea Turtles entangled along the Nova Scotia side of the Bay of Fundy between 1998-2014: rock crab (n=1), inshore lobster gear (n=2), miscellaneous/unknown buoy line (n=2), boat mooring rope (n=1) (Hamelin et al. 2017). Entanglement can also compromise a turtle's ability to swim, resulting in drowning. There are reports of Leatherback Sea Turtles becoming entangled in lines associated with coastal aquaculture operations in Atlantic Canada, e.g. scallop spat collector ropes, lines associated with mussel farm operations (Hamelin et al. 2017). The proposed site expansion is unlikely to increase the risk of impact on the leatherback turtles above that associated with the existing site.

North Atlantic Right Whale

North Atlantic Right Whale (*Eubalaena glacialis*) are listed as Endangered under SARA. North Atlantic Right Whale are a migratory species that frequents coastal waters. They come to Atlantic Canadian waters to feed and may be present in the Bay of Fundy in spring, summer and fall (Figure B4). Grand Manan Basin (Bay of Fundy) has been identified as critical habitat. A search of the whale sightings database resulted in 2 records from the entrance of the Annapolis Basin. A record in 2010 corresponds to a North Atlantic Right Whale that was entangled and reported as "dead on gear", while the 2011 record was observed from shore and from passengers onboard the Princess of Acadia. The proposed site expansion is unlikely to increase the risk of impact on the North Atlantic Right Whale above that associated with the existing site.

Harbour Porpoise

Harbour Porpoise (*Phocoena phocoena*) are listed as of Special Concern under SARA. In Eastern Canada, Harbour Porpoise range from the Bay of Fundy to Baffin Island. They are often sighted close to shore, especially during the summer months. Figure 4 shows Harbour Porpoise

sightings (from the marine mammal sightings database) recorded between 2001-2017 in the Bay of Fundy, close to the mouth of the Annapolis Basin. The proposed site expansion is unlikely to increase the risk of impact on the Harbour Porpoise above that associated with the existing site.

Blue Whale

Blue Whale (*Balaenoptera musculus*) are listed as Endangered under SARA. Northwest Atlantic Blue Whales are generally found in waters off eastern Canada: in the northern Gulf of St. Lawrence, off the coasts of Nova Scotia and Newfoundland, and in the Davis Strait (Figure B4). They are migratory and frequent the Gulf of St. Lawrence and eastern Scotian Shelf between January and November. They feed almost exclusively on euphasiids but can also consume copepods (*Calanus*). The proposed site expansion is unlikely to increase the risk of impact on the Blue Whale above the minimal risk associated with the existing site.

Fin Whale

Fin Whale (*Balaenoptera physalus*) are listed as Special Concern under SARA. Fin Whales generally travel alone or in small groups. They can be observed near the coast as well as far offshore. They feed on krill and small fish such as herring and capelin. During summer, they can be found in areas of krill concentration, including turbulent areas in the Bay of Fundy (Figure B4). Although bath pesticides, if released from the site, might negatively impact the crustaceans in the pelagic zone of exposure, the impact on the fin whales is expected to be minimal and the proposed site expansion is unlikely to increase the risk of impact on the Fin Whale above that associated with the existing site.

Other Marine Mammals

Figure 6 shows other marine mammal records from the study area, including Humpback Whale (*Megaptera novaeangliae*) and Harbour seal (*Phoca vitulina*). There was one record of a Humpback Whale inside the Annapolis Basin, which made an incursion into the Annapolis River in 2004. Humpback Whales have been sighted near aquaculture sites. Humpback Whale and Harbour Seal are listed as Not at Risk by COSEWIC and the proposed site expansion is unlikely to increase the risk of impact on these mammals above the minimal risk associated with the existing site.



Figure 7. Map showing the location of marine mammal sightings that have been reported to and recorded in the Fisheries and Oceans whale sightings database. The blue polygon displays the region of interest for this review. The yellow polygon shows the distribution of the proposed aquaculture site expansion.

Commercial Fisheries Species of Interest

Based on a search of the MARFIS database, the commercial fisheries in the zone of influence include Scallop, Sea Urchin, Groundfish, and Lobster.

American Lobster

Based on the original surveys by Lawton et al. (1995), it can be expected that lobsters (*Homarus americanus*) will utilize the area within the zone of influence seasonally, including the potential for some overwintering habitat use. Based on tagging conducted in the early 1990s, it is expected that lobsters could either remain in the area of the zone of influence for a short period (e.g. as part of a seasonal migration through Annapolis Basin), or could remain in the vicinity for significant periods of time (e.g. for feeding and/or moulting).

In the early 1990s, diving surveys conducted between the Victoria Beach and Port Wade area did document the presence of newly-settled lobsters. Though there was no similar survey coverage in the Rattling Beach area, it may be expected that similar, shallow (e.g. <20 m) hard bottom (cobble/boulder) habitat within the aquaculture lease area could be considered as potential lobster settlement habitat. Following initial benthic settlement, lobsters are likely to occupy small home ranges within this type of habitat for at least one, potentially 2 - 3 years following settlement.

For Site 1039, given the documentation on depth profiles and benthic habitat as determined from the baseline video surveys, the primary juvenile habitat contained within the site is likely already within the existing site boundary, and within the existing zone of influence. Research on the interactions between lobster and aquaculture is underway. Much of the habitat in the lease expansion area is beyond 20 m depth and characterized by softer habitat types and so less likely to be significant settlement habitat. There may be potential for lobster in the near-vicinity of the existing and expanded site to be exposed to drugs (e.g. oxytetracycline used in 2016) and pesticides (not used in 2016-17) introduced into the environment via in-feed treatments.

Sea Scallop

The aquaculture site and zone of influence overlaps with Scallop Production Area (SPA) 5, and the nearshore portion of SPA 4 (Figure 7a; Nasmith et al. 2016). The area outlined in red in Figure 7a (referred to as the study area) includes highly productive habitat for the Sea Scallop (*Placopecten magellanicus*) (Shumway and Parsons 2006; Nasmith et al. 2016).

From 2014 to 2018 inclusive (5 years), 29 inshore scallop survey tows were conducted within the Annapolis area (Figure 7a,b). Sea scallops were present in all tows conducted (e.g. scallop found in 29 of 29 tows). Other bycatch recorded on the inshore scallop survey and found within the Annapolis boundary area, along with observed relative frequencies, are listed in Appendix C3. Bycatch recorded on the inshore scallop survey consists of recording lobster, commercial fish species, skates, octopus, and squid. Scallops remain in the area and on the bottom year-round and use the area for spawning and feeding. The scallop larvae are pelagic and are in the water column seasonally.

The effect of finfish farming on scallops is largely unknown. The proposed site expansion is unlikely to increase the risk of impact on scallop above the risk associated with the existing site.







Figure 8b. Inshore scallop survey tow locations (black crosses) from 2014 to 2018 inclusive within the zone of influence.

Clams

The Maritimes Region is divided into seven Clam Harvesting Areas (CHA). Annapolis Basin falls within CHA 2, which includes both recreational and commercial harvest. Subject to any variation or prohibition orders, clam harvesting is open April 1 to Dec. 31, with no harvesting between sunset and sunrise. Clam harvesting may include bar clams, bay quahogs, razer clams and

soft-shell clams. The recreational daily limit for Annapolis Basin is 100 clams/quahogs in total, with no limit for commercial harvesters. Only hand and handheld tools are permitted.

The Annapolis River is considered an important clam spawning area, supplying the rest of Annapolis Basin (Buzeta 2014). In 2007, a report by the Clean Annapolis River project reported that the intertidal zones of the Annapolis Basin had the potential for a very productive and lucrative soft-shell clam industry, but several factors have contributed to the decline of the clam populations and increasing closure of clam harvesting areas since the 1970s (Sullivan 2007).



Figure 9. Clam harvesting zones within the Annapolis basin as of 2009 (data from Environment Canada: <u>http://www.gulfofmaine.org/2/category/ecosystem-indicator-partnership/page/7/</u>)

Sea Urchin

There are 17 commercial dive-only licenses authorized to fish sea urchins in Southwest Nova Scotia by inshore vessels, including 1 license issued as a First National Commercial Communal License. Access is restricted to commercial harvesters only, on a limited entry basis. The Nova Scotia fishery has been limited in recent years. However, a search of the MARFIS database indicates that sea urchins are being landed from the zone of influence of the aquaculture site, as recently as 2017. There may be potential for sea urchins in the near-vicinity of the existing and expanded site to be exposed to drugs (e.g. oxytetracycline used in 2016) and pesticides (not used in 2016-17) introduced into the environment via in-feed treatments. The proposed site expansion is unlikely to increase the risk of impact above the risk associated with the existing site.

Groundfish

DFO's Research Vessel (RV) survey is typically used to describe the distribution of groundfish in the Maritimes Region, including the Bay of Fundy. Research Vessel survey catches and trends over time of key groundfish species are described in the annual Maritimes Research Vessel Survey Trends report for the Scotian Shelf and Bay of Fundy (DFO 2019). Since the RV survey does not conduct stations within the Annapolis Basin, other sources of information were used to confirm presence of groundfish species within the zone of influence of the aquaculture site: including the ISDB, MARFIS and the Scallop Survey. From these various sources, the groundfish species caught within the zone of influence between 2008-2018 include Cunner (Tautogolabrus adspersus), Sea Raven (Hemitripterus americanus), Longhorn Sculpin (Myoxocephalus octodecemspinosus), Thorny Skate (Amblyraja radiata), Winter Flounder (Pseudopleuronectes americanus), Winter Skate (Leucoraja ocellata), Atlantic Cod (Gadus morhua), Haddock (Melanogrammus aeglefinus), Monkfish (Lophius americanus), American Plaice (Hippoglossoides platessoides), Windowpane Flounder (Scophthalmus aquosus), Cusk (Brosme brosme), Halibut (Hippoglossus hippoglossus), Ocean Pout (Zoarces americanus). Pollock (Pollachius virens), Silver Hake (Merluccius bilinearis), Smooth Skate (Malacoraja senta), Little Skate (Leucoraja erinacea), Spiny Dogfish (Squalus acanthias), Summer Flounder (Paralichthys dentatus), White Hake (Urophycis tenuis), Red Hake (Urophycis chuss), Yellowtail Flounder (Limanda ferruginea) and Witch Flounder (Glyptocephalus cynoglossus) (Appendix C).

The most recent update of the RV Survey Trends Report (DFO 2019) includes the current status and trends for most of these species. There may be potential for the benthic feeding species within the near-field zone of influence of site to be exposed to drugs (e.g. oxytetracycline used in 2016) and pesticides (not used in 2016-17) introduced into the environment via in-feed treatments. The proposed site expansion is unlikely to increase the risk of impact above the risk associated with the existing site.

Recreational and Aboriginal Fisheries

There are a number of recreational and aboriginal, including FSC, fisheries of relevance to the study area. These include fisheries for diadromous species such as Striped Bass (*Morone saxatilis*), American Eel (*Anguilla rostrata*), Alewife (*Alosa pseudoharengus*), Blueback Herring (*Alosa aestivalis*), Rainbow Smelt (*Osmerus mordax*), and American Shad (*Alosa sapidissima*), as well as marine species such as Atlantic Tomcod (*Microgadus tomcod*), Mackerel (*Scomber scombrus*) and Tuna. Of these species, there is one ISDB record of Alewife and American Shad from the zone of influence from this aquaculture site expansion.

The **American Shad** (*Alosa sapidissima*) is an anadromous coastal migrant that naturally inhabits the Northwest Atlantic, ranging from Newfoundland and Labrador south to Florida (Scott and Scott 1988). Shad are an important species to commercial, recreational, and aboriginal fisheries. They are fished commercially in the Maritimes Provinces, including the Bay of Fundy, but are no longer fished commercially in the Annapolis River (Melvin et al. 1985, Chaput and Bradford 2003). They are also kept as bycatch in gaspereau fisheries in the Maritimes. They are fished recreationally in many rivers, including the Annapolis River. The Bay of Fundy population of American Shad includes the large Annapolis River spawning population (Hasselman et al. 2010). American Shad native to the Annapolis River are known to spawn in May-June; following spawning, adult fish will leave the estuary, and if in the Bay of Fundy, make their way counter-clockwise around the Bay, and head back out to sea in the fall (Melvin et al. 1985, Dadswell et al. 1987, Williams and Daborn 1984). The migrating fish may, therefore, pass by the aquaculture site.

Alewife and Blueback Herring are often grouped together under the broader term of gaspereau. They range coastally throughout the Northwest Atlantic. They live mostly at sea but

enter freshwater habitats to spawn (Scott and Scott 1988). In the Annapolis River system, adult Blueback Herring and Alewife spawn in the river during spring or early summer and then move back to sea quickly following spawning. They migrate in and out of the Annapolis Basin and likely pass by the proposed lease area on their way to their spawning grounds.

Striped Bass had three spawning populations within the Bay of Fundy DU: Shubenacadie, Saint John, and Annapolis. The Annapolis population is considered extirpated (COSEWIC 2012a, DFO 2014, Bradford et al. 2015). These species are found in large numbers throughout the Bay of Fundy and likely transit in the vicinity of the proposed lease area.

American Eel spend most of their lives in fresh water, and all adults migrate to and spawn in the Sargasso Sea (Scott and Scott 1988, COSEWIC 2012b). Juveniles and adults are present in most freshwater water bodies with a connection to the Atlantic Ocean. Eels are fished commercially at a number of different life stages and are often caught recreationally as well. They are of significant value to aboriginal communities, who have fished them for thousands of years. They have been assessed as Threatened by COSEWIC. American Eel are present in the Annapolis River basin area (Gibson and Daborn 1995). Adults are expected to pass by the proposed lease area as they migrate out of the Annapolis Basin between February and August, with juveniles (glass eels and elvers) returning as they move into estuaries and towards fresh water.

Atlantic Tomcod is an inshore marine fish, seasonally abundant in the Bay of Fundy. In Canada, Atlantic Tomcod spawn in early to mid-winter, moving inshore, often into rivers and estuaries, in December, and moving back to sea in January swiftly following spawning (Scott and Scott 1988). Atlantic Tomcod have been captured in the Annapolis River area (Gibson and Daborn 1993, Gibson and Daborn 1995, Stokesbury 1985).

The interaction between the above species and the aquaculture site is expected to be of a transient nature, and the proposed site expansion is unlikely to increase the risk of impact above the risk associated with the existing site.

Other Species of Interest

Information on potentially vulnerable commercial species and species at risk has been provided above. Some additional information on plankton, other crustaceans, polychaete and potentially vulnerable species is provided below.

The relative abundance and frequency of 148 phytoplankton species was recorded in the Annapolis Basin from 1988-1994 (Keizer et al. 1996). The Annapolis Basin is a zone with high concentrations of biomass of *Ascophyllum nodosum* (Rockweed), an algal species that has commercial value in Atlantic Canada (Figure 3 in Ugarte et al. 2010). The nutrients released from the fish farm are likely diluted very quickly and impacts on the phytoplankton are likely to be minimal, especially if the phytoplankton production is light, rather than nutrient limited.

There are important concentrations of zooplankton and Atlantic Herring (*Clupea harengus*) feeding outside of the Annapolis Basin along Digby Neck and Long Island (Power et al. 2003). The Annapolis River is recognized as an important clam spawning area, supplying the rest of Annapolis (DFO 2013a). Juvenile lumpfish have been observed inside Annapolis Basin between July and October (Daborn and Gregory 1983 in DFO 2013a). Basking Sharks (*Cetorhinus maximus*) are listed as Special Concern by COSEWIC. Their distribution includes de Bay of Fundy. Sightings and tagging information does not include areas nearby the Annapolis Basin (Hoogenboom et al. 2015). The full list of species considered in this analysis is included in Appendix D.

The proponent reported Rock Crab. Green Crab and hermit crab, whelks, barnacles, kelp, rockweed, sea stars, *Flustra*, periwinkles, and quahogs from video footage and collected grab samples. ISDB records reported the presence of several invertebrate species including Jonah Crab, Atlantic Rock Crab, Brachyuran crabs, hermit crabs, Asteroidea (Sea stars) Phylum, and Green Sea Urchin (*Strongylocentrotus droebachiensis*) (Table B:1). Polychaetes such as *Nephtys neotella* under mussel lines and *Nereis diversicolor* under fish pens have been reported nearby aquaculture sites within the Inshore Scotian Shelf (Pocklington et al. 1994) and their presence is probable in the Annapolis Basin. Bloodworms are most abundant on estuarine soft muds rich in organic matter, whereas sandworms are on cleaner soil associated with clam flats (McCullough et al. 2005) and, thus, they may be distributed in the Annapolis Basin area.

Habitat Spatial Distribution and Usage

There is no identified marine Critical Habitat within the estimated zones of influence, but there is habitat suitable for a variety of species including lobster, scallop, and wild Atlantic Salmon.

Comparison of Potential Aquaculture Impacts to Habitat Impacts from Other Activities

No comparison to impacts from other anthropogenic sources have been made for this review. Earlier Science Responses on wild salmon populations in the vicinity of proposed finfish aquaculture provides information on how impacts to the wild salmon population from a proposed aquaculture development site compare to the impacts from other anthropogenic sources (DFO 2011a,b). In future, the application of a cumulative effects (CE) analysis during the advisory process would allow for a comparison of anthropogenic impacts on key marine habitats. As both human activities and marine habitats vary in their spatial (and temporal) distribution, the application of a CE impact analysis using GIS (e.g. Halpern et al. 2009; Clarke Murray et al. 2015) would allow patterns of overlap in human activities to be visualized, in order to identify intensely impacted areas and/or areas with a large human footprint. Partitioning cumulative impact scores among stressor categories or habitat types could identify the highest impact activities or particularly vulnerable habitats, respectively. Successive model scenarios could then be employed to evaluate the additive burden of additional human use activities in the area of interest. For the Annapolis Basin specifically, cumulative effects may stem from both landand ocean-based human activities. For example, detrimental increases in BOD could result from the cumulative impact of the expansion of fin-fish aquaculture combined with excessive nutrient inputs from sewage treatment plant discharge and agricultural run-off from the Annapolis Valley, as well as the occurrence of seasonal algal blooms in the basin.

Co-occurring human activities create multiple impacts on marine ecosystems. The broader goal of cumulative effects research is to quantify the basic linkages along the human activity–stressor–impact pathway and determine how such impacts accumulate and interact to produce cumulative effects (Clarke Murray et al. 2014). Towards this end, DFO has recently acquired capacity to help address cumulative effects through the creation of a National Ecosystem Stressors Program, with a central hub located in the Pacific Region (Ocean Sciences Division, Institute for Ocean Sciences, Sidney BC), whose work is focused on developing frameworks, conceptual models, and best-practice guidance for CE research. In the Maritimes Region, regional CE impact mapping exercises are currently underway, and results of this research will be available for 2019-2020 and beyond.

Although the Annapolis Basin receives nutrient inputs from a large agricultural area (Keizer et al 1996), there has been no attempt in this response to examine the potential for nutrient related effects.

Comments on Proponent's Deposition Model

Question 3. The proponent has used a depositional model to predict the benthic effects of the proposed aquaculture site. Are the predicted benthic effects, as demonstrated by the output of the depositional model used by the proponent, consistent with the scientific knowledge of the potential impact of this operation?

The proponent used the AquaModel to produce outputs concerning the flux of carbon to the seabed and the associated benthic effects. The proponent did not provide, and presumably was not asked to provide, estimates of pesticide or drug exposures or effects.

The predicted benthic effects, as demonstrated by the output of the depositional model used by the proponent, are consistent with the DFOs scientific considerations of the potential impact of the proposed operation. The details supporting this conclusion are given in Part B of the response to Question 1. Some of the uncertainties associated with the model are indicated in the Sources of Uncertainty Section of this Response.

Sources of Uncertainty

Model Estimates

The model results presented here suggest there could be a significant flux of carbon to the sea bed, that if the flux actually occurs there could be significant reduction in the bio-diversity of the benthic macro in-fauna and that the area of exposure and impact will be beyond the proposed site net-pen array, and beyond some portions of the lease boundary.

The model results are estimates of the potential scale and intensity of exposure and impact, especially for benthic impact. As with all models, outputs from the models have uncertainty associated with them. In the case of aquaculture models when predictions have been compared to observations the length scales of the exposure areas are more consistent with observations than the intensities of impact. For example, a comparison of output from the DEPOMOD benthic carbon flux model to observations in the Maritimes Region showed that predictions of low carbon flux corresponded with observations of low impact, but predictions of high carbon flux corresponded with observations (Chang et al. 2012, DFO 2012b).

The uncertainty is related to many factors including differences between assumed and actual feeding and feed wastage rates, actual currents throughout the production cycle, the duration of maximum and mean feeding periods, the assumptions of horizontal homogeneity in the current, errors in bathymetry, the accuracy and number of environmental impact indicators, and the time scale and history need for carbon flux to evolve into sulfide concentrations that result in changes to bio-diversity, among other factors. The deposition model results presented by the proponent are stated as being for the times of peak and mean feeding (SIMCorp 2018), but changes in the timing and duration of these may result in changes in the predictions as was the case in the DEPOMOD evaluation (Chang et al. 2012, DFO 2012b).

The proponent provided high resolution bathymetry data for the area of interest but did not correct the collected data for variation in tidal height at the time of the soundings (SIMCorp. 2016). Since the tidal range varies between 5 m and 8 m, if reduced to chart datum, the uncorrected bathymetry could differ from bathymetry adjusted to chart datum by as much as 8 m, depending on the time of year and phase of the tide the survey was conducted. This error is incorporated into the AquaModel results since it affects the estimated sinking times of the organic material released from the farm.

The current used to drive the proponent's AquaModel was from a single ADCP location. It is likely, however, that current patterns vary spatially as the bathymetry varies spatially. Using a single current meter record, especially in an area of spatially varying bathymetry, can result in either an over or under estimate of the spatial extent and shape of the exposure zone. The general magnitude of the zone is, however, likely to be robust to this uncertainty since the model results are consistent with the simple calculations.

It was determined that the DFO model estimates of the water current speeds at the location of the proponent's ADCP deployment were larger than the observed currents. However, since no other current data were available from the vicinity of the proposed site at the time of response, it was not possible to comprehensively determine the overall performance of the DFO hydrodynamic or particle tracking model in the region of interest. The fact that the model and simple calculations result in similar magnitudes of exposure zone length scales suggests the conclusions are robust to the differences between the model and observations.

Given the uncertainties the magnitude of the spatial scales of the predictions are thought to be reasonably robust but the intensity estimates, although reasonable, are thought to be less robust. Model sensitivity analyses and comparisons between model outputs and observations

will be needed to reduce the uncertainty. Except for a comparison between model and observed current at one location, no comparisons between the present predictions and observations have been made, nor can they be made until data is available from the operations of the expanded site. The existing regulatory environmental monitoring program does not have sufficient spatial resolution or extent to thoroughly test the model predictions.

Species and Habitat Distributions

Coastal areas are generally not adequately sampled on spatial and temporal scales of most relevance to aquaculture, i.e. tens to hundreds of meters and hours to months, and hence information on these space and time scales is generally not contained within the various data sources available to DFO, including the surveys referred to in this document. Therefore, there is uncertainty as to the exact distribution of species in the area of the proposed expansion.

More specifically, the relative frequency of different species in the Annapolis Basin was obtained from MARFIS, ISDB, and the inshore scallop survey. These surveys do not fully sample the basin spatially or temporally and, therefore, additional information on presence and habitat use (i.e. spawning, migration, feeding) must be drawn from larger-scale studies, which were also generally utilized by the proponent.

Effects on Species and Habitats

Science has focused mainly on the effect of organic loading to the seabed and its correspondence with degrees of the bio-diversity of macro-infauna in the upper few centimeters if the bottom sediment. Relatively little effort has been directed to the relation between the benthic carbon fluxes and commercial, recreational, aboriginal and at risk species considered to be within the potential zones of exposure is not well explored in the scientific literature.

Conclusions

Question 1: Does the zone of influence extend beyond the boundaries of the aquaculture facility?

- The estimated zone of influence for BOD, potential pesticides and drugs appears to extend beyond the boundaries of the aquaculture net-pen array and the net-pen anchor system.
- The spatial extent of the predicted zones of benthic exposure and influence associated with both BOD and drugs extend beyond the northeast portion of the proposed site lease boundary by a distance of order 100 m.
- The pelagic zones associated with bath pesticides, if they were to be used, are estimated to extend a distance in the order of kilometers beyond the cage array and lease boundary.

Question 2: What species and habitats, with a focus on species at risk, commercial species and those sensitive to aquaculture, exist within this zone of influence (and the broader Bay)? How do these species utilize (i.e. spawning, migrating, feeding, etc.) this area (eg. the zone of influence)? Are there any habitats within the zone of influence considered critical or valuable for these species?

There are many aquatic marine species and habitats within the Annapolis Basin and within the proposed lease area.

- This response has focused on species of commercial, recreational, aboriginal (CRA) interest and species at risk (SAR).
- Several CRA and SAR species exist within the area of interest.
- The list includes:

- lobsters, scallops, clams, Atlantic Salmon, Striped Bass, American Eel and perhaps North Atlantic Right Whales
- Scallops are expected to be in the area year-round
- Scallop and clam larvae are expected to be in the water seasonally.
- Adult and juvenile Lobsters may be present year-round, with the majority of adult Lobsters migrating away from the area for the winter period.
- The area has been identified as being within or on the fringe of the migration pathways for several species including the endangered wild Atlantic Salmon, Striped Bass, and American Eel.
- No spawning grounds of important marine species have been identified within the Annapolis Basin and within the estimated zones of exposure and influence.
- No critical habitats for important marine species have been identified for the Annapolis Basin and within the estimated zones of exposure and influence.
- No comparison to impacts from other anthropogenic sources have been made.

Question 3: Are the predicted benthic effects, as demonstrated by the output of the depositional model used by the proponent, consistent with the scientific knowledge of the potential impact of this operation?

- The BOD benthic effects associated with organic loading of the sea bed and predicted by the proponent are consistent with existing scientific prediction capabilities.
- The proponent's predictions are limited to the flux of carbon to the seabed and are of most relevance to the bio-diversity of benthic infauna and to the spatial extent of in-feed drugs;
- The predictions suggest a potential for elevated sediment sulfide concentrations under the site net-pens and between the net-pens and 100-200 m distance from the net-pens.
- Previous science has indicated the existing prediction capabilities for BOD benthic impacts agree well with observations on the spatial length scales of the exposure and influence zones and with observations of low impact; predictions of high impact do not necessarily correspond to observations of high impact.
- The proponent was not required and did not provide information on the potential impact of pesticides or drugs.
- One drug, oxytetracycline, has been used at the site in the past. The exposure zone associated with this drug is assumed to be similar to that of exposure to BOD, since the drug is administered through feed.
- The impact of drugs on the benthic organisms and habitat is generally unknown, although the potential for inducing anti-microbial resistance in benthic microbes is a topic of growing interest.
- If the proposed site continues to operate without the use of pesticides there will be no influence or pesticide exposure zones to influence either the pelagic or benthic marine environment. If bath pesticides were to be used in the future, there may be some influence on pelagic zooplankton within a radius of a few hundred to a few kilometers of the site, depending upon the pesticide used. If in-feed drugs, including antibiotics and pesticides, were to be used in the future, there may be some influence on benthic fauna and bacteria within and near the site. The site has used oxytetracycline in the past.
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Sources of information

Amiro, P.G., J.C. Brazner, and J. Voutier, J. 2008a. An assessment of the potential for recovery of the Atlantic salmon designated unit for the inner Bay of Fundy: Habitat issues. DFO Can. Sci. Adv. Sec. Res. Doc. 2008/058.

Amiro, P.G., J.C. Brazner, and J. Voutier, J. 2008b. An assessment of the potential for recovery of the Atlantic salmon designated unit for the inner Bay of Fundy: Threats. DFO Can. Sci. Adv. Sec. Res. Doc. 2008/058.

Armstrong, S.M., B.T. Hargrave and K. Haya. 2005. Antibiotic use in Finfish Aquaculture: Modes of Action, Environmental Fate, and Microbial Resistance. Hdb Env. Chem. Vol 5 Part M (2005): 3541-357

Anderson, Haya and Burridge 2005.

- Bowlby, H.D., Gibson, A.J.F., and Levy, A. 2013. Recovery Potential Assessment for Southern Upland Atlantic Salmon: Status, Past and Present Abundance, Life History and Trends. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/005. v + 72 p.
- Bowlby, H.D., Horsman, T., Mitchell, S.C., and Gibson, A.J.F. 2014. Recovery Potential Assessment for Southern Upland Atlantic Salmon: Habitat Requirements and Availability, Threats to Populations, and Feasibility of Habitat Restoration. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/006. vi + 155 p.
- Bradford, R.G., Halfyard, E.A., Hayman, T., and P. LeBlanc . 2015. Overview of 2013 Bay of Fundy Striped Bass Biology and General Status. DFO Canadian Science Advisory Secretariat Research Document 2015/024. iv+36 p.
- Burridge, L. 2013. A review of potential environmental risks associated with the use of pesticides to treat Atlantic salmon against infestations of sea lice in southwest New Brunswick, Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/050. iv + 25 p.
- Burridge L.E., J.L. Van Geest. 2014. A review of potential environmental risks associated with the use of pesticides to treat Atlantic salmon against infestations of sea lice in Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/002. vi + 39 p.
- Buzeta, M-I. 2014. Identification and Review of Ecologically and Biologically Significant Areas in the Bay of Fundy. DFO. Can. Sci. Advis. Sec. Res. Doc. 2013/065. vi + 59 p. http://waves-vagues.dfo-mpo.gc.ca/Library/359756.pdf
- Canty, M.N., J.A. Hagger, R.T.B. Moore, L. Cooper, T.S. Galloway. 2007. Sublethal impact of short term exposure to the organophosphate pesticide azamethiphos in the marine mollusc *Mytilus edulis*. Marine Pollution Bulletin 54: 396–402.
- Chang, B.D., Page, F.H., Losier, R.J., and McCurdy, E.P. 2012. Predicting organic enrichment under marine finfish farms in southwestern New Brunswick, Bay of Fundy: Comparisons of model predictions with results from spatially-intensive sediment sulfide sampling. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/078. iv + 146 p.
- Chaput, G., and R.G. Bradford. 2003. American shad (*Alosa sapidissima*) in Atlantic Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2003/009. iv + 71 p.
- Clarke, C.N., S.M. Ratelle, and R.A. Jones. 2014. Assessment of the Recovery Potential for the Outer Bay of Fundy Population of Atlantic Salmon: Threats to Populations. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/006.
- Clarke Murray, C., M. Mach, and R.G. Martone. 2014. Cumulative effects in marine ecosystems: scientific perspectives on its challenges and solutions. WWF-Canada and Center For Ocean Solutions. 60 pp.
- Clarke Murray, C., Agbayani, S., Alidina, H.M. and Ban, N.C., 2015. Advancing marine cumulative effects mapping: An update in Canada's Pacific waters. Marine Policy, 58, pp.71-77.
- COSEWIC. 2006. COSEWIC Assessment and Status Report on the White Shark Carcharodon carcharias (Atlantic and Pacific Populations) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. (Accessed September 2016).
- COSEWIC. 2012a. COSEWIC assessment and status report on the Striped Bass *Morone saxatilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Iv + 82 p.
- COSEWIC. 2012b. COSEWIC assessment and status report on the American Eel Anguilla rostrata in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii+109pp.

- Dadswell, M.J., Melvin, G.D, Williams, J.P. and D.E. Themelis. 1987. Influences of Origin, Life History, and Chance on the Atlantic Coast Migration of American Shad. American Fisheries Society Symposium. 1: 313 – 330.
- Davies, P.A. Gillibrand, J.G. McHenery, G.H. Rae. 1998. Environmental risk of ivermectin to sediment dwelling organisms. Aquaculture 163: 29–46. <u>https://ac.els-</u> cdn.com/S0044848698002117/1-s2.0-S0044848698002117-main.pdf?_tid=71d56c1d-<u>3f4d-433c-a36f-</u> 583c97e780bf&acdnat=1548862898_3d75a3e5f9e9ef3070ccb507a3a022ad
- DFO. 1999. Interaction between wild and farmed Atlantic salmon in the Maritime Provinces. DFO Mar. Reg. Hab. Status Rep. 99/1E.
- DFO. 2006. Science Expert Opinion on Critical Habitat designation for inner Bay of Fundy Atlantic salmon. Can. Sci. Adv. Sec. Sci. Res. 2006/004.
- DFO. 2008. Recovery Potential Assessment for Inner Bay of Fundy Atlantic Salmon. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2008/050.
- DFO. 2010. Recovery Strategy for the Atlantic salmon (*Salmo salar*), inner Bay of Fundy populations [Final]. Species at Risk Act Recovery Strategy Series.
- DFO. 2011a. Wild Salmon Populations in the Vicinity of a Proposed Finfish Aquaculture Development in St. Mary's Bay, Nova Scotia. DFO Can. Sci. Advis. Sec. Sci. Resp. 2011/001.
- DFO. 2011b. Wild Salmon Populations in the Vicinity of a Proposed Finfish Aquaculture Development at Little Musquash Cove, New Brunswick. DFO Can. Sci. Advis. Sec. Sci. Resp. 2011/004.
- DFO. 2012a. Fish Populations in the Vicinity of Three Proposed Finfish Aquaculture Sites in Shelburne County, Nova Scotia. DFO Can. Sci. Advis. Sec. Sci. Resp. 2011/017.
- DFO. 2012b. Review of DEPOMOD Predictions versus Observations of Sulfide Concentrations around five Salmon Aquaculture Sites in Southwest New Brunswick, DFO Can. Sci. Advis. Sec. Advis. Rep. 2012/042.
- DFO 2013a. Identification and Review of Ecologically and Biologically Significant Areas in the Bay of Fundy. Can. Sci. Adv. Sec. Sci. Res. 2013/065.
- DFO. 2013b. Potential exposure and associated biological effects from aquaculture pest and pathogen treatments: anti-sea lice pesticides (part II). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/049.
- DFO. 2014. Recovery Potential Assessment for the Bay of Fundy Striped Bass (*Morone saxatilis*) Designatable Units. DFO . Canadian Science Advisory Secretariat Science Advisory Report 2014/053.
- DFO. 2017a. Stock Status Update of Atlantic Salmon in Salmon Fishing Areas (SFAs) 19-21 and 23. DFO Can. Sci. Advis. Sec. Sci. Resp. 2017/020.
- DFO. 2017b. Evaluation of Scope for Harm for White Shark (*Carcharodon carcharias*) in Atlantic Canada. DFO Can. Sci. Advis. Sec. Sci. Resp. 2017/025.
- DFO. 2019. 2018 Maritimes Research Vessel Survey Trends on the Scotian Shelf and Bay of Fundy. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/012.
- EC. 2005. Use of Emamectin Benzoate in the Canadian Finfish Aquaculture Industry: A Review of Environmental Fate and Effects. Doug A. Bright, Ph.D., R.P.Bio. and Scott Dionne, M.Eng. UMA Engineering Ltd. <u>http://publications.gc.ca/collections/Collection/En4-51-2005E.pdfl. M</u>.
- Fergusson, I., L.J.V. Compagno, and Marks, M. 2009. *Carcharodon carcharias*. The IUCN Red List of Threatened Species 2009: e.T3855A10133872.; (Accessed September 2016).
- Glass, A. 2017. Maritimes Region Inshore Scallop Assessment Survey: Detailed Technical Description. Can. Tech. Rep. Fish. Aquat. Sci. 3231: v + 32 p

- Gibson, A.J.F., and H.D. Bowlby. 2013. Recovery Potential Assessment for Southern Upland Atlantic Salmon: Population Dynamics and Viability. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/142. iv + 129 p.
- Gibson, A.J.F., H.D. Bowlby, D.C. Hardie, and P.T. O'Reilly. 2011. Populations on the brink: Low abundance of Southern Upland Atlantic salmon in Nova Scotia, Canada. North Amer. J. Fish. Manag. 31: 733-741.
- Gibson, A.J.F., H.D. Bowlby, J.R. Bryan, and P.G. Amiro. 2008. Population Viability Analysis of inner Bay of Fundy Atlantic Salmon with and without Live Gene Banking. DFO Can. Sci. Advis. Sec. Res. Doc. 2008/057. v + 71 p.
- Gibson, A.J.F. and G.R. Daborn. 1993. Distribution and Downstream Movement of Juvenile Alosines in the Annapolis River Estuary, Final Report. Acadia Centre for Estuarine Research Publication No. 33, Wolfville, N.S.
- Gibson, A.J.F. and G.R. Daborn. 1995. Population Size, Distribution and Fishway Utilization of Juvenile Alosines in the Annapolis River Estuary. Acadia Centre for Estuarine Research Publication No. 36, Wolfville, N.S.
- Gibson, A.J.F., H.D. Bowlby, D.L. Sam, and P.G. Amiro. 2009. Review of DFO Science Information for Atlantic Salmon (Salmo salar) Populations in the Southern Upland Region of Nova Scotia. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/081. vi + 83 p.
- Gibson, A.J.F., and A.L. Levy. 2014. Recovery Potential Assessment for Eastern Cape Breton Atlantic Salmon (*Salmo salar*): Population Viability Analyses. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/005. v + 43 p.
- Halpern, B. S., C.V. Kappel, K.A. Selkoe, F. Micheli, C., Ebert, C. Kontgis, C.M. Crain, R. Martone, C. Shearer, and S.J. Teck. 2009. Mapping cumulative human impacts to California Current marine ecosystems. Conservation Letters 2:138–148.
- Hargrave, B. T. 2010. Empirical relationships describing benthic impacts of salmon aquaculture. Aquacult Environ Interact. Vol. 1: 33–46
- Haya, K., L.E. Burridge, I.M. Davies, and A. Ervik. 2005. A Review and Assessment of Environmental Risk of Chemicals Used for the Treatment of Sea Lice Infestations of Cultured Salmon. Env Chem, Vol. 5, Part M. Pp 305 – 340.
- HC. 2016. Azamethiphos, Proposed Registration Decision, PRD2016-25. Pesticide Management Regulatory Agency, Health Canada. http://publications.gc.ca/collections/collection_2016/sc-hc/H113-9-2016-25-eng.pdf
- Hasselman, D.J, R.G. Bradford, and P. Bentzen. 2010. Taking stock: defining populations of American shad (*Alosa sapidissima*) in Canada using neutral genetic markers. Canadian Journal of Fisheries and Aquatic Sciences. 67:1021-1039.
- Hamelin, K.M, M.C. James, W. Ledwell, J. Huntington, and K. Martin. 2017. Incidental capture of leatherback sea turtles in fixed fishing gear off Atlantic Canada. Aquatic Conserv: Mar Freshw Ecosyst. 1-12. doi: 10.1002/aqc.2733.
- Hoogenboom, J. L., Wong, S. N., Ronconi, R. A., Koopman, H. N., Murison, L. D., and Westgate, A. J. 2015. Environmental predictors and temporal patterns of basking shark (*Cetorhinus maximus*) occurrence in the lower Bay of Fundy, Canada. J. Exp. Mar. Biol. Ecol. 465, 24–32. doi: 10.1016/j.jembe.2015.01.005

Huntsman, A.G. 1937. The cause of periodic scarcity in Atlantic salmon. Royal Soc. Can. 17-27.

- Jones, R.A., L. Anderson, and C.N. Clarke. 2014. Assessment of the Recovery Potential for the Outer Bay of Fundy Population of Atlantic Salmon (*Salmo salar*): Status, Trends, Distribution, Life History Characteristics and Recovery Targets. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/008. vi + 94 p.
- Keizer P, D. Milligan, D. Subba Rao, P. Strain, and G. Budgen. 1996 Phytoplankton monitoring program: Nova Scotia component—1989 to 1994. Canadian Technical Report of Fisheries and Aquatic Sciences 2136. Department of Fisheries and Oceans. Bedford

Institute of Oceanography. <u>http://publications.gc.ca/collections/collection_2014/mpo-dfo/Fs97-6-2136-eng.pdf</u>

- Kenneth D. Black, Stuart Fleming, Thomas D. Nickell and Paula M. F. Pereira. 1997. The effects of ivermectin, used to control sea lice on caged farmed salmonids, on infaunal polychaetes. ICES Journal of Marine Science, 54: 276–279.
- Lacroix, G.L. 2012. Migratory strategies of Atlantic Salmon (*Salmo salar*) postsmolts and implications for marine survival fo endangered populations. Canadian Journal of Fisheries and Aquatic Sciences 70: 32-48.
- Lacroix G. L. 2013. Population-specific ranges of oceanic migration for adult Atlantic salmon (*Salmo salar*) documented using pop-up satellite tags, Canadian Journal of Fisheries and Aquatic Sciences 70:1011-1030.
- Lacroix G. L. 2014. Large predators could jeopardize the recovery of endangered Atlantic salmon, Canadian Journal of Fisheries and Aquatic Sciences 71: 343-350.
- Lacroix, G.L. and I.A. Flemming. 1998. Ecological and behavioural interactions between farmed and wild Atlantic salmon: consequences for wild salmon. CSAS Research Document 98/162.
- Lawton, P., D.A. Robichaud, and M. Moisan. 1995. Characteristics of the Annapolis Basin, Nova Scotia, lobster fishery in relation to proposed marine aquaculture development. Can. Tech. Rep. Fish. Aquat. Sci. 2035. iii + 26 p.
- Leggatt, R.A., P.T. O'Reilly, P.J. Blanchfield, C.W. McKindsey, and R.H. Devlin. 2010. Pathway of effects of escaped aquaculture organisms or their reproductive material on natural ecosystems in Canada. Can. Sci. Adv. Sec. Res. Doc. 2010/019. vi + 70 p.
- Levy, A.L., and A.J.F. Gibson. 2014. Recovery Potential Assessment for Eastern Cape Breton Atlantic Salmon (*Salmo salar*): Status, past and present abundance, life history, and trends. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/099. v + 72 p.
- Li, M. Z., C. G. Hannah, W. A. Perrie, C. C.L. Tang, R. H. Prescott and D. A. Greenberg. 2015. Modelling seabed shear stress, sediment mobility, and sediment transport in the Bay of Fundy. Can. J. Earth Sci. 52: 757–775
- Lyons, McKeigan, Wong and F.H. Page. 2014. Degradation of hydrogen peroxide in seawater using the anti-sea louse formulation Interox® Paramove™50. Canadian Technical Report of Fisheries and Aquatic Sciences 3080. http://publications.gc.ca/collections/collection_2014/mpo-dfo/Fs97-6-3080-eng.pdf
- McCullough, D.M., P.A. Doherty, H.L. Schaefer, C. Deacoff, S.K. Johnston, D.R. Duggan, B.D. Petrie and V.V. Soukhovtsev. 2005. Significant Habitats: Atlantic Coast Initiative (SHACI): Halifax Regional Municipality, Units 4-6. Can. Manuscr. Rep. Fish. Aquat. Sci. 2724: xvii + 501 p.
- Melvin, G.D., Dadswell, M.J., and J.D. Martin. 1985. Impact of Lowhead Hydroelectric Tidal Power Development on Fisheries. Part 1: A Pre-Operation Study of the Spawning Population of American Shad, *Alosa sapidissima* (Pisces: Clupeidae), in the Annapolis River, Nova Scotia, Canada. Canadian Technical Report of Fisheries and Aquatic Sciences. 1340: iv+33p.
- Morris, M.R.J., D.J. Fraser, A.J. Heggelin, F.G. Whoriskey, J.W. Carr, S.F. O'Neil, and J.A. Hutchings. 2008. Prevalence and recurrence of escaped farmed Atlantic salmon (Salmo salar) in eastern North American rivers. Can. J. Fish. Aquat. Sci. 65: 2807–2826.
- Nasmith, L., Sameoto, J., and Glass, A. 2016. Scallop Production Areas in the Bay of Fundy: Stock Status for 2015 and Forecast for 2016. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/021. vi + 140 p.
- Page, F.H. and L. Burridge. 2014. Estimates of the effects of sea lice chemical therapeutants on non-target organisms associated with releases of therapeutants from tarped net-pens and well-boat bath treatments: a discussion. Canadian Science Advisory Secretariat (CSAS) Research Document 2014/103, v+36 p.

- Page, F.H., B.D. Chang, M. Beattie, R. Losier, P. McCurdy, J. Bakker, K. Haughn, B. Thorpe, J. Fife, S. Scouten, G. Bartlett and B. Ernst. 2014. Transport and dispersal of sea lice bath therapeutants from salmon farm net-pens and well-boats operated in Southwest New Brunswick: a mid-project perspective and perspective for discussion. Canadian Science Advisory Secretariat (CSAS) Research Document 2014/102, 63 p.
- Pocklington, P., D.B. Scott and C.T. Schaefer. 1994. Polychaete response to different aquaculture activities. Mem. Mus. Hist. Nat. 162: 511-520.
- Power, M.J., G.D.Melvin and R. I. Stephenson. 2003. Stock status report of 4VWX herring. Dept. of Fish and Ocean Can. Mar. Reg. Stock Status Report 2003/027.
- McCullough, D.M., P.A. Doherty, H.L. Schaefer, C. Deacoff, S.K. Johnston, D.R. Duggan, B.D. Petrie and V.V. Soukhovtsev. 2005. Significant Habitats: Atlantic Coast Initiative (SHACI): Halifax Regional Municipality, Units 4-6. Can. Manuscr. Rep. Fish. Aquat. Sci. 2724: xvii + 501 p.
- Scott, W.B., and M.G. Scott. 1988. Atlantic fishes of Canada. Toronto, Canada: Toronto University Press.
- Schlenk, D., Sapozhnikova, Y., and Cliff, G. 2005. Incidence of Organochlorine Pesticides in Muscle and Liver Tissues of South African Great White Sharks *Carcharodon carcharias*. Mar. Pollut. Bull. 42:703-704.
- Shumway, S.E., Parsons, G.J. (Eds). Scallops: Biology, Ecology and Aquaculture. Second Edition. Elsevier, B.V. Amsterdam, The Netherlands. pp. 765-868.
- SIMCorp. 2016. Baseline Assessment Report Site #1039 Rattling Beach Annapolis Basin. Halifax, Nova Scotia, Canada: Sweeney International Marine Corporation.
- SIMCorp. 2018. Baseline Assessment Report Addendum Site #1039 Rattling Beach Annapolis Basin. Halifax, Nova Scotia: Sweeney International Marine Corp.
- Stokesbury, K. 1985. Downstream Movements of Juvenile Alosids and Preliminary Studies of Juvenile Fish Mortality associated with the Annapolis Tidal Power Turbine. Acadia Centre for Estuarine Research, Wolfville, N.S. Publication 2. 28p.
- Sullivan, D. 2007. A Population Survey and Resource Valuation of Soft-shell Clams (*Mya arenaria*) in the Annapolis Basin, NS. Clean Annapolis River Project. 27 p. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.493.8476&rep=rep1&type=pdf
- Swail, V.R., V.J. Cardone, M. Ferguson, D.J. Gummer, E.L. Harris, E.A. Orelup and A.T. Cox. 2006. The Msc50 Wind and Wave Reanalysis. 9th International Workshop on Wave Hindcasting and Forecasting September 25-29, 2006 Victoria, B.C. Canada
- Ugarte, R., J. Craigie and A. T. Critchley. 2010. Fucoid fauna of the rocky intertidal of the Canadian Maritimes: implications for the future with rapid climate change. In A. Israel, R. Einav and J. Seckbach (eds.) Seaweeds and their roles in globally changing environments. Springer, Heidelberg.
- Wildsmith, B. 1981. Annapolis valley tidal project. Atl. Salmon J. Oct. 1981: 28-29.
- Williams, R.R.G., and G.R. Daborn. 1984. Spawning of the American Shad (*Alosa sapidissima*) in the Annapolis River, Nova Scotia. Proceedings of the Nova Scotian Institute of Science. 34: 9 – 14.
- Winfield, L. 2018. Memorandum to Aquaculture Network Agencies Re: Aquaculture Amendment Application No. 1039 - Digby County Aquaculture Network Review. Nova Scotia Department of Fisheries and Aquaculture.

Appendix A: Description of DFO Modelling

As part of several DFO aquaculture research programs, a FVCOM (Finite Volume Coastal Ocean Model) was developed for the coastal areas of southwest New Brunswick. A triangular unstructured grid was developed which encompasses the Bay of Fundy, the Gulf of Maine and extends to the Scotian Shelf Break. The model domain extends west to Narragansett, RI, USA and east to Louisbourg, NS. The model uses 21 geometrically spaced vertical sigma-levels resulting in layer thicknesses ranging from centimeters to hundreds of meters. The horizontal grid resolution ranges from ~30m to ~10km with the finest resolution occurring in areas of aquaculture activities. The horizontal grid contains 178291 nodes (triangle vertices) and 342191 cells (triangles). The model was run using a time step of 1.5 seconds (Table A:1).

Grid	
Nodes	178291
Cells	342191
Horizontal Resolution	~30m - ~10km
Vertical Resolution	21 geometrically spaced sigma-levels
Time step	1.5 seconds

Table A:1. Details of the FVCOM grids.

FVCOM version 4.1 (DFO repository) was used. The model was run in fully baroclinic mode. The vertical mixing scheme was the GOTM implementation of the Mellor-Yamada 2.5 turbulence model. The simulation started on February 1st 2015 and ran for ~18 months, ending on August 5th 2016. The model used wetting and drying and the same time step for both external (barotropic) and internal (baroclinic) solutions.

Model forcing included fresh water input from 9 rivers. The open boundary was forced with sea surface height, temperature and salinity. At the sea surface, winds and heat-flux fields were applied. The model was started from rest (i.e. flat sea surface and zero currents) and initialized with temperature and salinity from daily averaged RIOPS values. The model forcing was ramped up over 18 hours and spun-up over a two-month period.

The 9 rivers included in the model run were the St Croix, Dennis Stream (which discharges into the St Croix River), Magaquadavic, Lepreau, Black, Point Wolfe, Petitcodiac, Digdeguash, Saint John rivers. Discharge data were obtained from Environment and Climate Change Canada (ECCC) and NB Power. The rivers were forced as a discharge, by adding a volume of fresh water into an element.

At the open boundary, the model was forced with sea surface height which had both tidal and non-tidal components. The tidal components were acquired from the OSU East Coast of the USA regional model. Five tidal constituents were included in the model forcing: M2, N2, S2, K1 and O1. The model was preliminary tuned for tides by altering the minimum bottom friction parameter. The non-tidal component was obtained by de-tiding hourly sea-surface height data

from RIOPS (Regional Ice Ocean Prediction System, an ECCC product). Temperature and salinity were specified at the open boundary using RIOPS daily averaged fields.

At the sea surface, atmospheric conditions were applied using data from the High Resolution Deterministic Prediction System (HRDPS), also an ECCC product, and included surface winds, air temperature, specific humidity, air pressure and long and short wave radiation. The heat-flux was calculated internally within FVCOM using the COARE 3.0 algorithm. Although evaporation and precipitation were not fully integrated in the model run, the COARE 3.0 algorithm computes the latent heat-flux thereby including the effects of evaporation on the total heat-flux.

Appendix B: Summary of SARA and COSEWIG species within the region of interest.

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
Acadian Redfish	Sebastes fasciatus	Atlantic population	Atlantic Ocean	Threatened	No	No Status	Possible. This population is found along most of Canada's Atlantic coast, from Baffin Island to the Scotian Shelf, as well as in the Gulf of St. Lawrence.
American Plaice	Hippoglossoides platessoides	Maritime population	Atlantic Ocean	Threatened	No	No Status	Possible. Prefer depths of 50 to 200 meters.
Atlantic Bluefin Tuna	Thunnus thynnus		Atlantic Ocean	Endangered	No	No Status	Possible. Fisheries for Atlantic Bluefin Tuna include the Bay of Fundy.
Atlantic Cod	Gadus morhua	Laurentian South population	Atlantic Ocean	Endangered	No	No Status	No
Atlantic Cod	Gadus morhua	Southern population	Atlantic Ocean	Endangered	No	No Status	Likely. Distribution extends from southern Nova Scotia and the Bay of Fundy, to Eastern Georges Bank.
Atlantic Salmon	Salmo salar	Inner Bay of Fundy population	New Brunswick, Nova Scotia, Atlantic Ocean	Endangered	Yes	Endangered	Possible
Atlantic Salmon	Salmo salar	Eastern Cape Breton population	Nova Scotia, Atlantic Ocean	Endangered	No	No Status	No
Atlantic Salmon	Salmo salar	Nova Scotia Southern Upland population	Nova Scotia, Atlantic Ocean	Endangered	No	No Status	Likely. Annapolis and Bear River in the Annapolis Basin are part of the southern Bay of Fundy DU; migration

¹ Listing under Schedule 1 of the *Species at Risk Act (SARA)*. SARA establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either extirpated, endangered, threatened, or a special concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
							routes would include the study area.
Atlantic Salmon	Salmo salar	Outer Bay of Fundy population	New Brunswick, Atlantic Ocean	Endangered	No	No Status	Possible
Atlantic Wolffish	Anarhichas Iupus		Arctic Ocean, Atlantic Ocean	Special Concern	Yes	Special Concern	Likely. There are 2 observer records from this location, but they are usually found at depths between 100-500m.
Basking Shark	Cetorhinus maximus	Atlantic population	Atlantic Ocean	Special Concern	No	No Status	Possible
Deepwater Redfish	Sebastes mentella	Gulf of St. Lawrence - Laurentian Channel population	Atlantic Ocean	Endangered	No	No Status	No. Distributed in the Gulf of St. Lawrence and on the Scotian Shelf, up to the continental slope.
Lumpfish	Cyclopterus lumpus		New Brunswick, Nova Scotia, Atlantic Ocean	Threatened	No	No Status	Likely. Lumpfish are widespread in both the pelagic and the demersal realm in waters off eastern Canada.
<u>Northern</u> <u>Wolffish</u>	Anarhichas denticulatus		Arctic Ocean, Atlantic Ocean	Threatened	Yes	Threatened	No. Found in the waters off of Nova Scotia, in the Gulf of St. Lawrence, around the island of Newfoundland, up the Labrador coast to Baffin Island.
Porbeagle	Lamna nasus		Atlantic Ocean	Endangered	No	No Status	Possible. Continuous distribution in Canadian waters ranging from northern Newfoundland and Labrador to the Gulf of St. Lawrence and around Newfoundland to the Scotian Shelf and the Bay of Fundy.

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
Roundnose Grenadier	Coryphaenoides rupestris		Arctic Ocean, Atlantic Ocean	Endangered	No	No Status	Unlikely. Species is most abundant from Davis Strait, on the continental slope off of Newfoundland and Labrador, and along the edge of the Grand Banks to Georges Bank. It is sometimes captured on the Scotian Shelf. Usually found at depths between 400- 1200m.
<u>Shortfin Mako</u>	Isurus oxyrinchus	Atlantic population	Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador, Atlantic Ocean	Special Concern	No	No Status	Possible
Smooth Skate	Malacoraja senta	Laurentian- Scotian population	Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Atlantic Ocean	Special Concern	No	No Status	Likely
Thorny Skate	Amblyraja radiata		Nunavut, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador, Arctic Ocean, Atlantic Ocean	Special Concern	No	No Status	Possible

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
White Hake	Urophycis tenuis	Atlantic and Northern Gulf of St. Lawrence population	Atlantic Ocean	Threatened	No	No Status	Likely
White Shark	Carcharodon carcharias	Atlantic population	Atlantic Ocean	Endangered	Yes	Endangered	Yes
Winter Skate	Leucoraja ocellata	Eastern Scotian Shelf - Newfoundland population	Atlantic Ocean	Endangered	No	No Status	No. Designatable Unit is limited to 4VW (Eastern Scotian Shelf).
<u>American Eel</u>	Anguilla rostrata		Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador, Atlantic Ocean	Threatened	No	No Status	Possible
Atlantic Sturgeon	Acipenser oxyrinchus	Maritimes populations	New Brunswick, Nova Scotia, Atlantic Ocean	Threatened	No	No Status	Likely. A spawning population is known to occur in the Saint John River. Adults spend much of their non-breeding time at sea where they can migrate over extensive distances along the coast while feeding. Atlantic Sturgeon have been observed in the Annapolis River, and elsewhere in the Bay of Fundy.
Atlantic Whitefish	Coregonus huntsmani		Nova Scotia	Endangered	Yes	Endangered	No

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
Rainbow Smelt	Osmerus mordax	Lake Utopia small-bodied population	New Brunswick	Endangered	Yes	Threatened	No
Rainbow Smelt	Osmerus mordax	Lake Utopia large-bodied population	New Brunswick	Endangered	No	No Status	No
<u>Shortnose</u> <u>Sturgeon</u>	Acipenser brevirostrum		New Brunswick, Nova Scotia	Special Concern	Yes	Special Concern	Unlikely. The Saint John River population tends to reside mainly in the river and estuary, and is rarely observed in the marine environment of the Bay of Fundy.
<u>Striped Bass</u>	Morone saxatilis	Bay of Fundy population	New Brunswick, Nova Scotia, Atlantic Ocean	Endangered	No	No Status	Unlikely. Historically, three rivers draining into the Bay of Fundy supported striped bass spawning populations; however, the Annapolis River has shown no evidence of spawning or recruitment since 1976. A recreational fishery for striped bass is concentrated at the base of the dam in summer and fall.
Blue Whale	Balaenoptera musculus	Atlantic population	Atlantic Ocean	Endangered	Yes	Endangered	Unlikely. Observed in the entrance of Bay of Fundy.
Fin Whale	Balaenoptera physalus	Atlantic population	Atlantic Ocean	Special Concern	Yes	Special Concern	Possible. Observed near the coast, as well as far offshore. They feed on krill and small fish such as herring and capelin. During summer, they can be found in areas of krill concentration, such as turbulence areas in the Bay of Fundy.

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
Harbour Porpoise	Phocoena phocoena	Northwest Atlantic population	Atlantic Ocean	Special Concern	No	Threatened	Likely. Often sighted close to shore, especially during the summer months. In eastern Canada, harbour porpoises range from the Bay of Fundy to Baffin Island.
Killer Whale	Orcinus orca	Northwest Atlantic / Eastern Arctic population	Arctic Ocean, Atlantic Ocean	Special Concern	No	No Status	Unlikely. Distribution maps include the Bay of Fundy.
North Atlantic Right Whale	Eubalaena glacialis		Atlantic Ocean	Endangered	Yes	Endangered	Possible. A migratory species that frequents coastal waters. Come to Atlantic Canadian waters to feed and may be present in the Bay of Fundy in spring, summer and fall. Grand Manan Basin (Bay of Fundy) is critical habitat.
<u>Northern</u> <u>Bottlenose</u> <u>Whale</u>	Hyperoodon ampullatus	Scotian Shelf population	Atlantic Ocean	Endangered	Yes	Endangered	No. The Scotian Shelf population inhabits deep waters (>500 m) along the continental slope off of NS and southeastern NL. The majority of sightings to date have been in three adjacent submarine canyons on the Eastern Scotian Shelf: the Gully, Shortland Canyon, and Haldimand Canyon.
Sowerby's Beaked Whale	Mesoplodon bidens		Atlantic Ocean	Special Concern	Yes	Special Concern	No. Sowerby's Beaked Whale is thought to mostly inhabit deep waters (>500 metres) along the continental slope from Nova Scotia to the Davis Strait.

Common name	Scientific name	Population	Range	COSEWIC status	Schedule 1 ¹ (Yes/No)?	SARA status	Expected Presence in Study Area?
Leatherback Sea Turtle	Dermochelys coriacea	Atlantic population	Atlantic Ocean	Endangered	Yes	Endangered	Unlikely. Bay of Fundy hosts relatively few foraging leatherbacks during the summer and fall.

Appendix C: ISDB and MARFIS Species within the Region of Interest

The search of the Industry Survey Database (ISDB) resulted in 412 records within the zone of influence polygon (Figure B1; Table B1). These records indicated that multiple fish and invertebrate species are in the Annapolis Basin to the east and north of the proposed lease site.





Figure B1. Maps showing the location of samples recorded in the ISDB database. Yellow polygon indicates location of the aquaculture site expansion. Records were cropped to the polygon created based upon the estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3.

Table B:1. ISDB records for the Annapolis Basin by species or species group from 2008 to 2018. Records were cropped to the polygon created based upon the estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3.

Species	ISDB Records
SEA SCALLOP	58
AMERICAN LOBSTER	49
CUNNER	32
JONAH CRAB	19
SEA RAVEN	19
LONGHORN SCULPIN	18
ATLANTIC ROCK CRAB	16
ASTEROIDEA S.C.	15
SEA URCHINS	12
THORNY SKATE	10

Species	ISDB Records
SCALLOP SHELLS	7
WINTER FLOUNDER	7
STRONGYLOCENTROTUS	
DROEBACHIENSIS	6
BRACHIURAN CRABS	5
SEAWEED,(ALGAE),KELP	5
LEMONWEED	4
SEA CUCUMBERS	4
WINTER SKATE	4
SKATES (NS)	3
SPONGES	3
BRYOZOANS P.	2
COD(ATLANTIC)	2
HADDOCK	2
HERMIT CRABS	2
MONKFISH,GOOSEFISH,ANGLER	2
STRIPED ATLANTIC WOLFFISH	2
ALEWIFE (Gaspereau)	1
AMERICAN PLAICE	1
BRILL/WINDOWPANE	1
CRAB	1
CUSK	1
HALIBUT(ATLANTIC)	1
HERRING(ATLANTIC)	1
MUSSELS (NS)	1
NEW ENGLAND NEPTUNE	1
OCEAN POUT(COMMON)	1
POLLOCK	1
SCULPINS	1
SHAD AMERICAN	1
SILVER HAKE	1
SMOOTH SKATE	1
SPINY DOGFISH	1
SUMMER FLOUNDER	1
WHITE HAKE	1
YELLOWTAIL FLOUNDER	1

The search of the MARFIS database resulted in 1523 records particularly within the Digby Gut area but also within the proposed lease area. This data indicated that sea scallops, lobster and sea urchins were within the Annapolis Basin, that sea scallops and lobster were within the proposed lease area and that sea urchins were near the lease area (Figure B2; Table B2). The baseline surveys conducted by the proponent found scallop shells rather than live scallops and found evidence of the presence of live adult lobsters.



Figure B2. Maps showing the location of samples recorded in the MARFIS database. Yellow polygon indicates location of the aquaculture site expansion. Records were cropped to the polygon created based upon the estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3.

Table B:2. MARFIS records for the Annapolis Basin by species or species group from 2008 to 2018. Records were cropped to the polygon created based upon the estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3.

Species	MARFIS records
SCALLOP, SEA	1218
SEA URCHINS	178
HALIBUT	23
HADDOCK	22
ATLANTIC COD	18
WINTER FLOUNDER	16
SCULPIN	15
MONKFISH	12
CUSK	5
POLLOCK	5
WHITE HAKE	5
YELLOWTAIL	4
LOBSTER	2

Table B3. Bycatch recorded on the inshore scallop survey within the Annapolis zone of influence from 2014 to 2018. Note the field 'observed individuals' can be used to interpret relative frequency within catch but abundances are not standardized. Bycatch recorded on the inshore scallop survey consists of recording lobster, commercial fish species, skates, octopus, and squid.

COMMON	SCIENTIFIC	Observed Individuals	Total Tows
AMERICAN LOBSTER	HOMARUS AMERICANUS	252	29
WINTER FLOUNDER	PSEUDOPLEURONECTES AMERICANUS	121	29
SQUIRREL OR RED HAKE	UROPHYCIS CHUSS	16	29
MONKFISH,GOOSEFISH,ANGLER	LOPHIUS AMERICANUS	11	29
LITTLE SKATE	RAJA ERINACEA	8	29
WHITE HAKE	UROPHYCIS TENUIS	6	29
WINTER SKATE	RAJA OCELLATA	6	29
BRILL/WINDOWPANE	SCOPHTHALMUS AQUOSUS	4	29
AMERICAN PLAICE	HIPPOGLOSSOIDES PLATESSOIDES	2	29
COD(ATLANTIC)	GADUS MORHUA	2	29
LEUCORAJA <35cm	LEUCORAJA SP	2	29
HADDOCK	MELANOGRAMMUS AEGLEFINUS	1	29
SHORT-FIN SQUID	ILLEX ILLECEBROSUS	1	29
SMOOTH SKATE	RAJA SENTA	1	29
WITCH FLOUNDER	GLYPTOCEPHALUS CYNOGLOSSUS	1	29



Figure B4. Map showing sightings that have been reported to and recorded in the Fisheries and Oceans whale sightings database of six SARA listed species. Records of this database are from 1963 to 2018. The blue polygon displays estimates of the trajectories of particles released from the proposed farm net-pen array illustrated in Figure 3.

Appendix D: List of Species considered in this report.

Algae Ascophyllum nodosum (rockweed) **Echinoderms** Sea urchin Mollusks Sea Scallop (*Placopecten magellanicus*) Mussels Clams, including soft-shell clam (Mya arenaria) Crustaceans American lobster (Homarus americanus) Rock Crab Jonah Crab **Diadramous** Atlantic Salmon (Salmo salar) American Eel (*Anguilla rostrata*) Alewife (Alosa pseudoharengus) Shortnose Sturgeon (Acipenser brevirostrum) Atlantic Sturgeon (Acipenser oxyrinchus) Striped Bass (Morone saxatilis) Rainbow Smelt (Osmerus mordax) American Shad (Alosa sapidissima) **Pelagics** Atlantic herring (Clupea harengus) Mackerel Bluefin Tuna Groundfish Cunner (Tautogolabrus adspersus) Sea Raven (Hemitripterus americanus) Longhorn Sculpin (Myoxocephalus octodecemspinosus) Thorny Skate (Amblyraja radiata) Winter Flounder (Pseudopleuronectes americanus) Winter Skate (Leucoraja ocellata) Atlantic Cod (Gadus morhua) Haddock (Melanogrammus aeglefinus) Monkfish (Lophius americanus) American Plaice (*Hippoglossoides platessoides*) Windowpane Flounder (Scophthalmus aquosus) Cusk (Brosme brosme) Halibut (Hippoglossus hippoglossus) Ocean Pout (Zoarces americanus) Pollock (Pollachius virens) Silver Hake (Merluccius bilinearis)

Smooth Skate (Malacoraja senta) Little Skate (Leucoraja erinacea) Spiny Dogfish (Squalus acanthias) Summer Flounder (Paralichthys dentatus) White Hake (Urophycis tenuis) Red Hake (Urophycis chuss) Yellowtail Flounder (Limanda ferruginea) Witch Flounder (Glyptocephalus cynoglossus) Atlantic Wolffish (Anarhichas lupus) Northern Wolffish (Anarhichas denticulatus) Atlantic Tomcod (Microgadus tomcod) Lumpfish (Cyclopterus lumpus) Sharks White Shark (Carcharodon carcharias) **Basking Shark** Reptiles Leatherback Sea Turtle (Dermochelys coriacea) **Marine Mammals** North Atlantic Right Whale (Eubalaena glacialis) Harbour Porpoise (Phocoena phocoena) Blue Whale (Balaenoptera musculus) Fin Whale (Balaenoptera physalus) Humpback Whale (Megaptera novaeangliae) Harbour Seal (Phoca vitulina) Killer Whale (Orcinus orca) Northern Bottlenose Whale (Hyperoodon ampullatus)

Appendix E: Description of chemicals that have been used by the Canadian Marine Finfish Industry in 2016 and 2017.

Bath Pesticides

Hydrogen peroxide is a pesticide used to help control sea lice on cultured salmon while in the aquaculture facility net-pens. The pesticide is applied by using a bath treatment that involves either tarping of a net-pen or pumping of the fish from the net-pen into a well-boat well. In both cases, the untreated pesticide is released into the receiving environment after the treatment. The non-target organisms affected by hydrogen peroxide include crustaceans (DFO 2013b) and zooplankton. Hydrogen peroxide in its purest form is a short-lived compound and decomposes very quickly to form water and oxygen. Studies have shown that the anti-sea lice form of hydrogen peroxide has a half-life of ca 14 to 28 days in unfiltered seawater at a concentration of 1.2 g·L-1 (Lyons et al. 2014). A half-life of 7 days in seawater has also been documented (Haya 2005). Due to its decomposition and rapid dilution and dispersion effects after release from the net pen or when discharged from a well boat, it is thought that hydrogen peroxide would not persist significantly in the environment.

Azamethiphos is a pesticide used to help control sea lice on cultured salmon while in the aquaculture facility net-pens. The pesticide is applied by using a bath treatment that involves either tarping of a net-pen or pumping of the fish from the net-pen into a well-boat well. In both cases the untreated pesticide is released into the receiving environment after the treatment. The non-target organisms affected by azamethiphos include crustaceans (DFO 2019) and molluscs such as Blue Mussel (*Mytilus edulis*)(Canty et al. 2007). Due to its low log Kow value, azamethiphos is highly soluble in water and, thus, is highly unlikely to bind to organics in suspension or in the sediment. The half-life of azamethiphos is ca 8.9 days. These characteristics, coupled with physical dispersion and dilution after released into the aquatic environment, suggest that it would not be persistent in the aquatic or benthic environment (HC, 2016).

In-Feed Pesticides

Emamectin Benzoate is a drug used to help control sea lice on the cultured salmon while contained within the aquaculture facility net-pens. The pesticide is delivered to the fish in the net-pen through the use of medicated fish feed. A portion of the pesticide is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the pesticide are released into the receiving environment as part of faecal release and exchanges through the fish gills. The non-target organisms affected by emamectin benzoate include crustaceans (DFO, 2019) as well as polychaetes in sediment. The risk to other non-target organisms is documented (EC 2005) with LC50 toxicity data citing effects to a wide range of organisms ranging from sand fleas (Corophium volutator) to American lobster (Homarus americanus). Emamectin benzoate has been shown to be persistent in both water and sediment (EC, 2005). In water, hydrolytic decomposition did not occur in a pH range of 5.2 to 8; however, at pH 9, the half-life of emamectin benzoate was reduced to 19.5 weeks. These values changed when photolysis was taken into consideration (0.7 to 35.4 days, summer/winter respectively). Due to the high log Kow value of emamectin benzoate it has a propensity to bind to organics. This is confirmed by an increase in half-life values in the region of 79 days and 349 days in aerobic and anaerobic soils respectively. Therefore, if the site were to be treated with this in-feed drug, it can be expected that it would persist in the benthic environment.

Ivermectin is a drug used to help control sea lice on the cultured salmon while in the aquaculture facility net-pens. The pesticide is delivered to the fish contained with a net-pen through the use of medicated fish feed. A portion of the pesticide is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the pesticide are released into the receiving environment as part of faecal release and exchanges through the fish gills. The non-target organisms affected by ivermectin include crustaceans (DFO, 2019). Ivermectin has a high log Kow value which means that it readily partitions into sediment. A half-life value of 100 days in sediment was determined by Davies et al (1998). This study determined that ivermectin was also toxic to starfish (*Asterias rubens*) and sand fleas (*Corophium volutator*). Polychaetes were also found to be affected by the presence of ivermectin in sediment at concentrations greater than would be expected from a single treatment. Such effects are possible due to the nature of the treatment application and the accumulative nature of the compound in sediment (Black et al, 1997).

Lufeneron is a drug used to help control sea lice on the cultured salmon. The pesticide is delivered to the fish through the use of medicated fish feed. A portion of the pesticide is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the pesticide are released into the receiving environment as part of faecal release and gill transfer. The non-target organisms affected by lufenuron include crustaceans (DFO, 2019). Lufenuron has a high log Kow value which suggests that it partitions readily into sediment with a half-life range of 13 to 23.7 days (Elanco Animal Health, 2016).

In-feed antibiotics

Erythromycin is an antibiotic drug used in the control of bacterial pathogens in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the antibiotic is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the pesticide are released into the receiving environment as part of faecal release and gill transfer. Though not directly toxic to marine organisms, the presence of antibiotics in the marine environment raises the possibility of the development of anti-microbial resistant bacteria. Erythromycin partitions readily into sediment due to its relatively high log Kow with a half-life of ca 29 to 38 days in experiments conducted in artificial seawater and ca 11 days in an artificial seawater/sediment mix (Jin-Wook Kwon, 2016).

Florfenicol is an antibiotic drug used in the control of bacterial pathogens in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the antibiotic is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the drug are released into the receiving environment as part of faecal release and gill transfer. Though not directly toxic to marine organisms, the presence of antibiotics in the marine environment raises the possibility of the development of anti-microbial resistant bacteria. The half-life of florfenicol in marine sediment (loam) containing 3.2% organic carbon was determined to be 8.4 days (Shering-Plough Animal Health Corp., 2006).

Oxytetracycline hydrochloride is an antibiotic drug used in the control of bacterial pathogens in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the antibiotic is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the drug are released into the receiving environment as part of faecal release and gill transfer. Though not directly toxic to marine organisms, the presence of antibiotics in the marine environment raises the possibility of the development of anti-microbial resistant bacteria. The half-life of oxytetracycline in marine sediment has been shown to range from 12 days (Coyne et al, 2001) to 32 ± 3 days

(Samuelsen, 1988). Other studies determined oxytetracycline half-lives in marine sediment to be in the range of 16 to 419 days (MELP, 1996). Coyne et al (1994) analysed sediments (top 2 cm) for oxytetracycline collected on day 10 of a 12 day treatment regime from under and around a cage block. Results showed concentrations were highest directly under the cage block with a lower concentration detected 25 m to the west; oxytetracycline was not detected in any other samples collected. Seventy-one days post end of treatment showed oxytetracycline to be below the limit of detection in all samples. Therefore, it may be assumed that the zone of exposure for oxytetracycline is directly under the cage site, although this may change in highly dynamic sites which experience strong tides and currents.

Praziquantel is a drug used in the control of internal parasitic worm infections in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the drug is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the pesticide are released into the receiving environment as part of faecal release and gill transfer. No data could be found regarding this drug's persistence in the environment.

Sulfadimethoxine/Ormetoprim is an antibiotic drug combination used in the control bacterial pathogen infections in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the drug is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the drug are released into the receiving environment as part of faecal release and gill transfer. Though not directly toxic to marine organisms, the presence of antibiotics in the marine environment raises the possibility of the development of anti-microbial resistant bacteria. Investigations have shown that Sulfadimethoxine/Ormetoprim can be detected 2 days after use but not 3 weeks after treatment of salmon net cages (Capone et al, 1996). This suggests that these compounds are relatively non-persistent in sediment after standard treatment.

Trimethoprim/Sulfadiazine is an antibiotic drug combination used in the control bacterial pathogen infections in cultured salmon while they are in the aquaculture facility net-pens. The drug is delivered to the fish through medicated fish feed. A portion of the drug is released into the receiving environment via uneaten fish feed and fish faeces and metabolites of the drug are released into the receiving environment as part of faecal release and gill transfer. Though not directly toxic to marine organisms, the presence of antibiotics in the marine environment raises the possibility of the development of anti-microbial resistant bacteria. Sulfadiazine and trimethoprim were found to have half-lives of 50 and 75 days respectively at 0 to 1 cm sediment depth. This increased to 100 days for both compounds when sampled at 5 to 7 cm sediment depth (Hektoen *et al*, 1994).

This Report is Available from the:

Center for Science Advice (CSA) Maritimes Region Fisheries and Oceans Canada 1 Challenger Drive, P.O. Box 1006 Dartmouth, Nova Scotia B2Y 4A2

Telephone: 902-426-7070 E-Mail: <u>XMARMRAP@dfo-mpo.gc.ca</u> Internet address: <u>www.dfo-mpo.gc.ca/csas-sccs/</u>

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Aussi disponible en français :

MPO. 2019. << insérez le titre ici – il doit correspondre exactement à celui de la page couverture, mais en lettres minuscules >>. Secr. can. de consult. sci. du MPO, Rép. des Sci. 2019/nnn.

From: Feindel, Nathaniel J <<u>Nathaniel.Feindel@novascotia.ca</u>>
Sent: Tuesday, February 11, 2020 11:37 AM
To: Parker, Edward V <<u>Edward.Parker@dfo-mpo.gc.ca</u>>
Cc: Williams, Wendy <<u>Wendy.Williams@dfo-mpo.gc.ca</u>>; Hancock, Bruce H
<<u>Bruce.Hancock@novascotia.ca</u>>
Subject: AQ#1039 Review of DFO Feedback

Hey Ed,

As discussed on the file call today. Please see the attached NSDFA review and comments in response to the comments provided to NSDFA by DFO on lease #1039.

This is what we would like to discuss in the morning of the "regulators meeting" apart from the proponent. Which I believe, this meeting date is still to be identified. We wanted to get this to you now so you can review and enable you to make arrangements to have the appropriate reviewers at the meeting to speak to the comments identified.

If you have any questions, let me know.

Thanks, Nathaniel

Nathaniel Feindel

Aquaculture Development and Marine Plants Harvesting- Manager N.S. Dept. Fisheries & Aquaculture 1575 Lake Rd., Shelburne, N.S., B0T1W0 T: (902) 875-7450 F: (902) 875-7429 E: Nathaniel.Feindel@novascotia.ca

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AQ#1039 Review of DFO Feedback

Issue	Document	Issue Identified	DFA Comments
ID #	Reference		
1	LOA - P. 2	"The proponent provided a predicted exposure zone for biochemical oxygen demanding matter, but not the other 2 classes of deleterious substances (as required by the AAR)."	This site already has approval under the AAR. Is DFO asking for this information to be provided? Clarification is required on intent of this statement
2	LOA - P.4	"Regulatory Review reviewed the proponent's Acoustic Deterrent Policy and recommends the proponent engage them prior to the use of acoustic deterrent devices to prevent contravention of section 35 of the Fisheries Act or sections 32 or 33 of SARA."	DFA could include in letter of approval (if one is issued).
3	LOA - P.4	"According to the proponent's predicted exposure zone for biochemical oxygen demanding matter there is a risk that the site could exceed this concentration limit."	This site already has approval under the AARs. No increase in production is proposed, therefore there should be no increase in risk.
4	LOA - P.4	"Biofouling Plan and Net washing Plan	DFO is requesting FMP for review. Continued discussions between DFO and DFA related to FMP.
5	LOA - P.5	"DFO Science's assessment of the effects of drugs was not as complete as for pest control products due to scientific uncertainties."	What are the scientific uncertainties? Clarification is required on intent of this statement.
6	LOA - P.5	"DFO recommends the proponent to have a site- specific chemical spill response plan so that a spill can be responded to in a manner that minimizes impacts to fish, fish habitat and	Spill response is contained within FMP but is also a requirement under AAR. This site currently has an AAR approval.

		aquatic species at risk. Without seeing this plan, DFO cannot make any comment on its suitability."	Continued discussions between DFO and DFA related to FMP.	
7	LOA - P.5/6	"DFO was unable to assess the mitigation of effects from the release of farmed fishPrior to it being finalized, DFO recommends the proponent provides the Farm Management Plan to DFO for review in accordance with DFO's legislative mandate."	Need clarification from DFO on if they are asking for the FMP before it is finalized or if they are asking to view the T&C of license. Continued discussions between DFO and DFA related to FMP.	
8	LOA - P.6	"DFO recommends the proponent take into consideration the drugs and pest control products they are authorized to deposit pursuant the AAR and the conditions under which they may be deposited, including the reasonable measures to minimize detriment to fish and fish habitat outside the facility."	Unclear as to what the action is here for DFA or the applicant? Clarification is required on intent of this statement.	
9	LOA - P.6	"DFO and NSDFA should discuss aspects of the Farm Management Plan that fall under the mandate of DFO. We will be in contact with your department soon in regards to a collaborative approach to that end."	Question the necessity of including this in a science advice letter on a specific application. Continued discussions between DFO and DFA related to FMP.	
10	LOA - P.6/7	"it is unlikely the residual negative effects will result in further serious harm to fish or fish habitat; or"	As written, it appears as though "serious harm to fish habitat" is occurring. Question the use of the word "further". Ongoing discussion between DFO and DFA.	
11	CSAS - P.2 "Context"	"Maritimes Science staff worked together to generate a science response to these questions, and the results were peer reviewed through a Canadian Science Advisory Secretariat (CSAS) Science Response Process."	Request clarification from DFO on Science Response being "peer reviewed". See reference on DFO website - <u>http://www.dfo- mpo.gc.ca/csas-sccs/process-processus/srp- prs-eng.htm</u>).	
12	CSAS - P.10 "Drugs"	"the existing records indicate the Rattling Beach farm operation has only used one drug, oxytetracycline, during the 2016 and 2017	DFO has not made a statement regarding drugs. This leaves uncertainty related to DFOs position on the use of drugs at this site. Can a	

		-	
12	CSAS D 12 first	calendar years. If the Rattling Beach farm operation were to use one or more drugs in the future, the drug may be one of the drugs that has already been reported as having been used in Canada in the 2016 and 2017 calendar years or listed by Fisheries and Oceans Canada on its web site referenced above. These potential drugs includeDrugs such asA brief description of each pesticide and drug is given in Appendix E."	statement similar to that made for pesticides be included in the DFO response? Clarification is required on intent of this statement.
13	CSAS - P.12 first bullet; and P.3 first paragraph	"For the following simple calculations, a fish feed sinking rate (<i>ws</i>) of 0.1m/s and a fish faecal sinking rate of 0.01 m/s has been assumed." "Estimations of the exposure of the seabed to organic releases from the finfish farm operation require information concerning the farm layout, feeding practices and the near and far-field oceanographic conditions. The estimates are often also sensitive to some of the input assumptions."	A 1 cm/s faecal settling rate is inconsistent with mean literature values of 3.2 (e.g. Reid et al 2012). However, different mass factions will settle at different rates. It could be the authors are using a minimal value to determine worst case scenario. It is stated that their approach is intended to be a 'rough estimate'. Nevertheless, the choice of 1 cm/s faecal settling rate is not cited nor described, which seems counter to statements that exposure of the seabed to organic releases is 'sensitive to some of the input assumptions' at the top of page 3. Clarification is required on use of 1 cm/s rate.
14	CSAS - Throughout document, e.g. P.16, P.17, P.19, P.21	Analysis of BOD, drugs, pesticides. "There are seven marine shellfish and two other marine finfish aquaculture sites within the Annapolis Basin area"	References to three finfish sites in Annapolis Basin throughout document; however, only two sites are active. The third site has not been actively farmed since 1990s. DFO's analysis takes into consideration three sites instead of two; therefore, results are an overestimate. DFA to provide clarification to DFO.

15	CSAS – P.10; P.17, second paragraph; P.19, second paragraph; P.36 - question 3, last bullet	 "If bath pesticides were to be used in the future, there may be some influence on pelagic zooplankton within a radius of a few hundred to a few kilometers of the site, depending upon the pesticide used." P. 10: "at present, only two pesticide active ingredients approved for use in bath treatments conducted in association with net-pens. Hydrogen peroxide and azamethiphos are unlikely to persist in the environment and, if used as per Health Canada's Pest Management regulatory guidelines, is unlikely to cause 	Inconsistency between wording in this bullet and statement made on p.10 relating to impact to non-target populations (identified as issue above). Should statement be included that speaks to the fact that there is uncertainty related to the impact of drugs? Lack of clarification on scale and impact. Potential for future discussion on delineation of the zones of influence - different for therapeutants; related to proper definition of scale. Clarification is required on intent of this statement.
16		significant harm to non-target populations."	
16	CSAS - P.24, first paragraph	"Wild Atlantic salmon populations can be affected by salmon aquaculture either by interaction in the immediate vicinity of the site or by the interactions of escaped aquaculture salmon with salmon in the wildSalmon aquaculture sites can potentially impact wild populations through the transmission of parasites, pathogens and disease from cage- farmed salmon; potentially increased predation as a result of predator attraction to the cage sites; and through an additional range of pathways that arise from aquaculture escapees Escapees can hybridize with wild salmon, which has the potential to reduce genetic fitness of wild populationsmitigation measures have been identified to reduce impacts from aquaculture activities on wild salmon populations"	Uncertain of the relationship of this comment to the specific application. DFO to clarify intent of statement. Clarification is required on intent of this statement.

	1		
17	CSAS - P.28, first	"There may be potential for lobster in the near-	Uncertain of the intent of the last statement.
	paragraph, last	vicinity of the existing and expanded site to be	What is the scale of potential impact and/or
	sentence	exposed to drugs (e.g. oxytetracycline used in	risk? Is there data to suggest that there may be
		2016) and pesticides (not used in 2016-17)	impacts associated with drugs and pesticides?
		introduced into the environment via in-feed	
		treatments."	Clarification is required on intent of this
			statement.
18	CSAS -	"The temperatures recorded at the	Using reference of "Winfield, 2018".
	Throughout	Rattling Beach farm site (Winfield 2018) indicate	Information sent to DFO by DFA staff member
	document e.g.	the farm site has a seasonal variation in	"Winfield". They are not the author of the
	P.9	temperatures as expected"	document.
19	CSAS - P.33, first	"No comparison to impacts from other	Refers to a comparison that was not made.
	statement; P.36,	anthropogenic sources have been made for this	
	last bullet on	review."	Clarification is required on intent of this
	question 2		statement.
20	CSAS - P.12, 9th	"Given that the exposure domain associated with	Should this be "dominated by faeces"? Where
	bullet	feed waste and faeces is likely to be dominated	deposited vs. overall load?
		by waste feed"	
			Clarification is required on intent of this
			statement.
21	CSAS - P.15, last	'The combination of our simple estimates and	Deposition rate contours are illustrated by the
	paragraph	that of the proponent suggest sediment sulfide	proponent (although it is not clear which
		concentrations will at times be sufficient	contour is which, without the colours defined
		elevated that benthic macro-infauna diversity	in figure 5. These should be detailed). The
		will be reduced within a zone that extends 100 to	simple model projection does not illustrate
		200m beyond the net pen array'.	deposition greater than 5 gC/m ² /d which would
			reduce biodiversity. Measuring the scale of
			200m in the proponent's model (figure 5) and
			applying that distance to the edge of the array,
			suggests that the vast majority (>95%) of
			deposition occurs within 200m. While there is
			no scale on the simple model, this appears as it
			may also be the case. Presumably the 1
			gC/m ² /d also occurs at the outer periphery of

	the depositional footprint and this would result in low effects at the furthest reaches plotted on the figures, according to the Hargrave table. Deposition beyond 200m to the extent biodiversity will be reduced, seems unlikely.
	Clarification is required on intent of this statement.

On May 6, 2020, at 4:36 PM, Parker, Edward V <<u>Edward.Parker@dfo-mpo.gc.ca</u>> wrote:

** EXTERNAL EMAIL / COURRIEL EXTERNE ** Exercise caution when opening attachments or clicking on links / Faites preuve de prudence si vous ouvrez une pièce jointe ou cliquez sur un lien

Hi Nathaniel,

Thank you for this as we appreciate the opportunity to improve the clarity by which we communicate the results of our reviews of aquaculture project proposals in the future. We are currently reviewing your document and organizing responses to the specific comments/questions you provided us. We will communicate with you soon regarding how to share our responses in a most constructive manner.

Thanks, Ed

Edward Parker Regional Senior Aquaculture Management Officer Telephone | Téléphone 902-402-0298 Facsimile | Télécopieur 902-426-7967 <u>Edward.Parker@dfo-mpo.gc.ca</u> Fisheries and Oceans Canada | Pêches et Océans Canada PO Box 1006, P600, Dartmouth, NS B2Y 4A2 CP 1006, P600, Dartmouth, N-É B2Y 4A2 Government of Canada | Gouvernement du Canada

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From: Feindel, Nathaniel J
Sent: May 6, 2020 6:15 PM
To: Parker, Edward V <<u>Edward.Parker@dfo-mpo.gc.ca</u>>
Cc: Williams, Wendy <<u>Wendy.Williams@dfo-mpo.gc.ca</u>>; Hancock, Bruce H
<<u>Bruce.Hancock@novascotia.ca</u>>; Dobson, Suzanne <<u>Suzanne.Dobson@dfo-mpo.gc.ca</u>>
Subject: Re: AQ#1039 Review of DFO Feedback

Thanks Ed,

Look forward to your review and discussing it with you.

Nathaniel

Sent from my iPhone

From: "Dobson, Suzanne" <<u>Suzanne.Dobson@dfo-mpo.gc.ca</u>>
Date: September 2, 2020 at 3:37:45 PM ADT
To: "Feindel, Nathaniel J" <<u>Nathaniel.Feindel@novascotia.ca</u>>
Cc: "Parker, Edward V" <<u>Edward.Parker@dfo-mpo.gc.ca</u>>, "Hancock, Bruce H"
<<u>Bruce.Hancock@novascotia.ca</u>>
Subject: Response to NSDFA Comments on DFO Advice and CSAS

** EXTERNAL EMAIL / COURRIEL EXTERNE ** Exercise caution when opening attachments or clicking on links / Faites preuve de prudence si vous ouvrez une pièce jointe ou cliquez sur un lien Hello Nathaniel,

Please find our responses to your comments on the DFO Advice and CSAS with regards to AQ#1039. Sue

Suzanne Dobson A/Regional Manager Aquaculture Management Maritimes Region Department of Fisheries and Oceans



AQ#1039 Review of DFO Feedback - DFO's response

Issue	Document Reference	Issue Identified	DFA Comments	DFO Comments
1	LOA - P. 2	"The proponent provided a predicted exposure zone for biochemical oxygen demanding matter, but not the other 2 classes of deleterious substances (as required by the AAR)."	This site already has approval under the AAR. Is DFO asking for this information to be provided? Clarification is required on intent of this statement.	No, DFO is not asking for this information to be provided. Statement could have been worded better to reflect that the biochemical oxygen demanding matter predicted exposure zone is the only one required in accordance with the AAR.
2	LOA - P.4	"Regulatory Review reviewed the proponent's Acoustic Deterrent Policy and recommends the proponent engage them prior to the use of acoustic deterrent devices to prevent contravention of section 35 of the Fisheries Act or sections 32 or 33 of SARA."	DFA could include in letter of approval (if one is issued).	Noted.
3	LOA - P.4	"According to the proponent's predicted exposure zone for biochemical oxygen demanding matter there is a risk that the site could exceed this concentration limit."	This site already has approval under the AARs. No increase in production is proposed, therefore there should be no increase in risk.	Noted.
4	LOA - P.4	"Biofouling Plan and Net washing Plan	DFO is requesting FMP for review. Continued discussions between DFO and DFA related to FMP.	Noted.
5	LOA - P.5	"DFO Science's assessment of the effects of drugs was not as complete	What are the scientific uncertainties?	More work has been done on biological effects of pest control
		as for pest control products due to		products and there is a better
---	-------------	---	---	--
		scientific uncertainties."	Clarification is required on intent of	understanding of the impacts on the
			this statement.	most sensitive species (i.e. non-
				target crustaceans, juvenile lobster).
				Less work has been done on the
				effects of drugs (e.g., does the drug
				have to be ingested? how long does
				it persist on the bottom? how
				quickly does it get buried?) and the
				CSAS peer-review of this work is not
				yet complete. There are
				uncertainties which will be
				addressed, hopefully, with ongoing
				work.
				The intent of this statement was to
				advise NSDFA of the scientific
				uncertainty associated with
				assessing the risk of drugs.
6	LOA - P.5	"DFO recommends the proponent to	Spill response is contained within	Noted.
		have a site-specific chemical spill	FMP but is also a requirement under	
		response plan so that a spill can be	AAR. This site currently has an AAR	
		responded to in a manner that	approval.	
		minimizes impacts to fish, fish habitat		
		and aquatic species at risk. Without	Continued discussions between DFO	
		seeing this plan, DFO cannot make	and DFA related to FMP.	
-		any comment on its suitability."		
/	LOA - P.5/6	"DFO was unable to assess the	Need clarification from DFO on if	DFO needs to see mitigations to
		of formed fich Drier to it heirs	they are asking for the FIVIP before it	morm its risk assessment and
		finalized DEO recommands the	is initialized of it they are asking to	review of the proposal.
		propopent provides the Farm		
		Management Plan to DEO for review	Continued discussions between DEO	
			and DEA related to EMP	
			and DFATEIALEU LU FIVIP.	

		in accordance with DFO's legislative		
8	LOA - P.6	"DFO recommends the proponent	Unclear as to what the action is here	The intent is for the proponent to be
		take into consideration the drugs and	for DFA or the applicant?	advised that they consider the use of
		authorized to deposit pursuant the	Clarification is required on intent of	authorized to use to mitigate the
		AAR and the conditions under which	this statement.	effects of pathogens and sea lice on
		they may be deposited, including the		wild fish. Also, the proponent is to
		reasonable measures to minimize		be advised of the AAR requirement
		detriment to fish and fish habitat		to undertake reasonable measures
		outside the facility."		to minimize detriment of drug and
				pesticide deposits to fish and fish
9		"DEO and NSDEA should discuss	Question the necessity of including	Noted
		aspects of the Farm Management	this in a science advice letter on a	Noted.
		Plan that fall under the mandate of	specific application.	
		DFO. We will be in contact with your		
		department soon in regards to a	Continued discussions between DFO	
		collaborative approach to that end."	and DFA related to FMP.	
10	LOA - P.6/7	"it is unlikely the residual negative	As written, it appears as though	Noted.
		effects will result in further serious	"serious harm to fish habitat" is	
		harm to fish or fish habitat; or"	occurring. Question the use of the	
			word further .	
			Ongoing discussion between DEO	
			and DFA.	
11	CSAS - P.2	"Maritimes Science staff worked	Request clarification from DFO on	A DFO Science Response Process
	"Context"	together to generate a science	Science Response being "peer	was conducted on February 9,
		response to these questions, and the	reviewed". See reference on DFO	2019. Peer review was provided by
		results were peer reviewed through a	website - <u>http://www.dfo-</u>	DFO staff.
		Canadian Science Advisory Secretariat	mpo.gc.ca/csas-sccs/process-	
12		(LSAS) Science Response Process."	processus/srp-prs-eng.ntm).	
12	(CSAS - P.10) "Drugs"	Pattling Reach farm operation has	regarding drugs. This leaves	
1	Diugs	I NATHING DEACH TATHI UPETALION HAS	i egai ullig ulugs. I IIIS leaves	

	only used one drug, oxytetracycline, during the 2016 and 2017 calendar years. If the Rattling Beach farm operation were to use one or more drugs in the future, the drug may be one of the drugs that has already	uncertainty related to DFOs position on the use of drugs at this site. Can a statement similar to that made for pesticides be included in the DFO response?	The CSAS response informed DFO's risk assessment of drugs and formed only part of the information DFO considered in its risk assessment of drugs.
	been reported as having been used in Canada in the 2016 and 2017 calendar years or listed by Fisheries and Oceans Canada on its web site referenced above. These potential drugs includeDrugs such asA brief description of each pesticide and drug is given in Appendix E."	Clarification is required on intent of this statement.	DFO's letter of advice includes a summary of its risk assessment of drugs.
13 CSAS - P.12 first bullet; and P.3 first paragraph	 "For the following simple calculations, a fish feed sinking rate (<i>ws</i>) of 0.1m/s and a fish faecal sinking rate of 0.01 m/s has been assumed." "Estimations of the exposure of the seabed to organic releases from the finfish farm operation require information concerning the farm layout, feeding practices and the near and far-field oceanographic conditions. The estimates are often also sensitive to some of the input assumptions." 	A 1 cm/s faecal settling rate is inconsistent with mean literature values of 3.2 (e.g. Reid et al 2012). However, different mass factions will settle at different rates. It could be the authors are using a minimal value to determine worst case scenario. It is stated that their approach is intended to be a 'rough estimate'. Nevertheless, the choice of 1 cm/s faecal settling rate is not cited nor described, which seems counter to statements that exposure of the seabed to organic releases is 'sensitive to some of the input assumptions' at the top of page 3.	It was recognized that there are ranges of sinking rates reported for different particulate materials, and the distribution of sinking speeds is poorly understood. Therefore, minimum sinking rates were used, along with maximum site depth and maximum observed current speed in the proponent's record, given that the intent was to provide a precautionary first order estimate.

14	CSAS -	Analysis of BOD, drugs, pesticides.	References to three finfish sites in	The CSAS response clearly
	Throughout	"There are seven marine shellfish and	Annapolis Basin throughout	indicates that cumulative exposures
	document,	two other marine finfish aquaculture	document; however, only two sites	to organic loading, pesticides, drugs
	e.g. P.16, P.17,	sites within the Annapolis Basin	are active. The third site has not	have not been considered in the
	P.19, P.21	area"	been actively farmed since	document in any detail. There are
			1990s. DFO's analysis takes into	some cautionary statements
			consideration three sites instead of	about the potential for cumulative
			two; therefore, results are an	interactions of multiple sites in an
			overestimate.	area; but these statements are not
				specific for the number of currently
			DFA to provide clarification to DFO.	active sites.
15	CSAS – P.10;	"If bath pesticides were to be used in	Inconsistency between wording in	These two statements are not
	P.17, second	the future, there may be some	this bullet and statement made on	entirely inconsistent: although the
	paragraph;	influence on pelagic zooplankton	p.10 relating to impact to non-target	bath pesticides are unlikely to
	P.19, second	within a radius of a few hundred to a	populations (identified as issue	persist in the environment, they do
	paragraph;	few kilometers of the site, depending	above). Should statement be	dilute from their treatment dose to
	P.36 - question	upon the pesticide used."	included that speaks to the fact that	non-toxic levels, potentially
	3, last bullet		there is uncertainty related to the	influencing pelagic zooplankton. The
		P. 10: "at present, only two	impact of drugs? Lack of clarification	interpretation of persistence is a
		pesticide active ingredients approved	on scale and impact. Potential for	longer time scale than the dilution
		for use in bath treatments conducted	future discussion on delineation of	time scale. The impact is likely not
		in association with net-pens.	the zones of influence - different for	significant as it is short lived.
		Hydrogen peroxide and	therapeutants; related to proper	
		azamethiphos are unlikely to persist	definition of scale.	
		in the environment and, if used as per		
		Health Canada's Pest Management	Clarification is required on intent of	
		regulatory guidelines, is unlikely to	this statement.	
		cause significant harm to non-target		
		populations."		
16	CSAS - P.24,	"Wild Atlantic salmon populations can	Uncertain of the relationship of this	This information informed DFO's risk
	first	be affected by salmon aquaculture	comment to the specific	assessment of escapees, which is an
	paragraph	either by interaction in the immediate	application. DFO to clarify intent of	effect that falls within DFO's
		vicinity of the site or by the	statement.	legislative mandate.
		interactions of escaped aquaculture		

		salmon with salmon in the wild	Clarification is required on intent of	DFO's letter of advice includes a
		Salmon aguaculture sites can	this statement.	summary of its risk assessment of
		potentially impact wild populations		escapes.
		through the transmission of parasites,		
		pathogens and disease from cage-		
		farmed salmon; potentially increased		
		predation as a result of predator		
		attraction to the cage sites; and		
		through an additional range of		
		pathways that arise from aquaculture		
		escapeesEscapees can hybridize		
		with wild salmon, which has the		
		potential to reduce genetic fitness of		
		wild populationsmitigation		
		measures have been identified to		
		reduce impacts from aquaculture		
		activities on wild salmon		
		populations"		
17	CSAS - P.28,	"There may be potential for lobster in	Uncertain of the intent of the last	This information informed DFO's risk
	first	the near-vicinity of the existing and	statement. What is the scale of	assessment of drugs and pesticides.
	paragraph, last	expanded site to be exposed to drugs	potential impact and/or risk? Is	DFO's letter of advice includes a
	sentence	(e.g. oxytetracycline used in 2016)	there data to suggest that there may	summary of its assessment of the
		and pesticides (not used in 2016-17)	be impacts associated with drugs	use of drugs and pesticides.
		introduced into the environment via	and pesticides?	
		in-feed treatments."		The literature cited below, as well as
			Clarification is required on intent of	environmental assessments
			this statement.	conducted by Health Canada,
				support the assertion that there is
				potential for harm to lobster and
				other organisms:
				 studies of in-feed drugs such as
				emamectin benzoate have
				shown lethal and non-lethal
				(premature moulting) toxic

				 effects to lobster (Burridge et al. 2000; Waddy et al., 2002; Burridge et al. 2008) lab assessments of azamethiphos have suggested lobster population impacts are a possibility, lethal or sublethal (i.e. reproductive impairment) (HCPMRA 2016, 2017; Burridge et al. 2005; Burridge et al. 2010; Burridge et al. 2011; Burridge 2013)
18	CSAS -	"The temperatures recorded at the	Using reference of "Winfield, 2018".	Noted.
	document e g	2018) indicate the farm site has a	member "Winfield" They are not	
	P.9	seasonal variation in	the author of the document.	
	_	temperatures as expected"		
19	CSAS - P.33,	"No comparison to impacts from	Refers to a comparison that was not	Intent of this statement was to
	first	other anthropogenic sources have	made.	advise Aquaculture Management
	statement;	been made for this review."		that this analysis was not done given
	P.36, last		Clarification is required on intent of	that DFO Science had been asked:
	bullet on		this statement.	"how do the impacts on these
	question 2			species from the proposed
				aquaculture site compare to impacts
				from other anthropogenic sources".
				for clarity
20	CSAS - P 12	"Given that the exposure domain	Should this be "dominated by	Wording is not clear. Dominance will
20	9th bullet	associated with feed waste and faeces	faeces"? Where deposited vs. overall	depend on the release scenario and
		is likely to be dominated by waste	load?	spatial location. The point of the
		feed"		statement was that DEPOMOD or
			Clarification is required on intent of	AQUAMOD simulates the release
			this statement.	and deposition of both waste feed
				and faeces, and the near-field

				intensities, which are usually the highest, are often dominated by the flux of waste feed.
				Therefore, when comparing predicted exposure zones (PEZs) to the DEPOMOD or AQUAMOD outputs, especially the 5g and 1g carbon outlines, the waste feed PEZ is likely the most appropriate. This has been the experience for several sites in which this type of comparisons has been made.
21	CSAS - P.15, last paragraph	'The combination of our simple estimates and that of the proponent suggest sediment sulfide concentrations will at times be sufficient elevated that benthic macro-infauna diversity will be reduced within a zone that extends 100 to 200m beyond the net pen array'.	Deposition rate contours are illustrated by the proponent (although it is not clear which contour is which, without the colours defined in figure 5. These should be detailed). The simple model projection does not illustrate deposition greater than 5 gC/m ² /d which would reduce biodiversity. Measuring the scale of 200m in the proponent's model (figure 5) and applying that distance to the edge of the array, suggests that the vast majority (>95%) of deposition occurs within 200m. While there is no scale on the simple model, this appears as it may also be the case. Presumably the 1 gC/m ² /d also occurs at the outer periphery of the depositional footprint and this would result in low effects at the furthest reaches	This information informed DFO's risk assessment of biochemical oxygen demanding matter. 5 gC/m ² /d is a value indicating a specific degree of biodiversity reduction; it is not an all or nothing threshold. Any flux of carbon has the potential to change biodiversity.

	plotted on the figures, according to the Hargrave table. Deposition beyond 200m to the extent biodiversity will be reduced, seems unlikely.
	Clarification is required on intent of this statement.

References cited:

Burridge, L.E., Haya, K., Waddy, S.L., and Wade, J. 2000. The lethality of anti-sea lice formulations Salmosan[®] (azamethiphos) and Excis[®] (cypermethrin) to stage IV and adult lobsters (Homarus americanus) during repeated short-term exposures. Aquaculture. 182: 27-35.

Burridge, L.E., Haya, K., and Waddy, S.L. 2005. Seasonal lethality of the organophosphate pesticide, azamethiphos to female American lobster (Homarus americanus). Ecotoxicol. Environ. Saf. 60: 277-281.

Burridge, L., Weis, J., Cabello, F., and Pizarro, J. 2008. Chemical use in salmon aquaculture: A review of current practices and possible environmental effects. Accessed Sept 5, 2009. www.worldwildlife.org/what/globalmarkets/aquaculture.

Burridge, L.E., Weis, J.S., Cabello, F., Pizarro, J. and Bostick, K. 2010. Chemical use in salmon aquaculture: a review of current practices and possible environmental effects. Aquaculture 306: 7-23.

Burridge, L.E., Doe, K.G. and Ernst, W. 2011. Pathway of effects of chemical inputs from the aquaculture activities in Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/017. vi + 57 p.

Burridge, L. 2013. A review of potential environmental risks associated with the use of pesticides to treat Atlantic salmon against infestations of sea lice in southwest New Brunswick, Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/050. iv + 25 p

HCPMRA. 2016a. Hydrogen Peroxide, Registration Decision, PRD2016-18, Pesticide Management Regulatory Agency, Health Canada.

HCPMRA. 2016b. Azamethiphos, Proposed Registration Document, PRD2016-25. Pesticide Management Regulatory Agency, Health Canada.

HCPMRA. 2017. Azamethiphos, Registration Decision, PRD2017-13. Pesticide Management Regulatory Agency, Health Canada.

Waddy, S.L., Burridge, L.E., Hamilton, M.N., Mercer, S.M, Aiken, D.E., and Haya, K. 2002. Emamectin benzoate induces molting in American Lobster, Homarus americanus. Can. J. Fish. Aquat. Sci. 59: 1096-1099.

From: Feehan, Jennifer <Jennifer.Feehan@novascotia.ca>
Sent: September 25, 2020 9:47 AM
To: 'Jeff Nickerson' <jnickerson@cookeaqua.com>; Jennifer Hewitt @@cookeaqua.com>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>; Watts, Melinda <Melinda.Watts@novascotia.ca>;
Feindel, Nathaniel J <Nathaniel.Feindel@novascotia.ca>; Ceschiutti, Robert
<Robert.Ceschiutti@novascotia.ca>
Subject: AQ#1039 Network Comments

Hi Jeff and Jennifer,

This email is regarding the Network Comments received for AQ#1039 Boundary Amendment. Please find attached:

- 1. DFO's Letter of Advice ("DFO Comments")
- 2. DFO CSAS Science Response: Appendix A
- 3. Table of NSDFA and DFO comments regarding letter of advice and CSAS
- 4. Compilation of Network Comments excluding those from DFO (see above) and Nova Scotia Office of Aboriginal Affairs (a separate meeting will be held)

We would like to set up a call to discuss once you have had a chance to review the documents. Please reach out to Lynn Winfield, <u>lynn.winfield@novascotia.ca</u>, to arrange a meeting.

Kind regards, Jennifer

Jennifer Feehan Aquaculture Advisor Nova Scotia Department of Fisheries and Aquaculture 1800 Argyle Street, 6th Floor WTCC Halifax, NS B3J 2R5 902-237-0771 jennifer.feehan@novascotia.ca DFO Comments - DFO_CSAS DFO Response to AQ1039 2018-MarAq-001_Ra Appendix A_25 Oct : NSDFA Comments o Compilation of Netv

*Please refer to correspondence above for attachments #1-3 in this email (see October 11, 2019, October 25, 2019, and September 2, 2020). For attachment #4, please refer to: Nova Scotia Department of Fisheries and Aquaculture's Report on Outcomes of Consultations for Lease and Licence AQ#1039, Section 4.0 - Appendices of Network Agency Consultation Documentation.

2020.10.06 2020.10.23 #1039 AQ#1039 Network C Rattling Beach Discu

Feehan, Jennifer

Subject: Location:	AQ#1039 Network Comments Discussion Microsoft Teams Meeting
Start: End:	Tue 2020-10-06 3:00 PM Tue 2020-10-06 4:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer: Required Attendees:	Feehan, Jennifer Jeff Nickerson; Jennifer Hewitt; Michael Szemerda; Feindel, Nathaniel J; Ceschiutti, Robert; Winfield, Lynn; Watts, Melinda

Hi all,

Discussion with KCS on AQ#1039 network comments received (see attached).

Cheers, Jennifer

Join Microsoft Teams Meeting

Learn more about Teams | Meeting options Join with a video conferencing device 20014895@t.plcm.vc VTC Conference ID: 1459813860 Alternate VTC dialing instructions



Help

Feehan, Jennifer

Subject: Location:	#1039 Rattling Beach Discussion Microsoft Teams Meeting
Start: End:	Fri 2020-10-23 1:00 PM Fri 2020-10-23 2:30 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer: Required Attendees:	Feindel, Nathaniel J Williams, Wendy; Parker, Edward V; Dobson, Suzanne; Jeff Nickerson; Feehan, Jennifer; Watts, Melinda; Cusack, Roland R; Hancock, Bruce H; Winfield, Lynn; Michael Szemerda
Optional Attendees:	Jennier Hewill, Kobert Ceschiulli

Hello all,

Just sending an update to make this a teams meeting. Please forward on to those in your respective organizations you would like to have attend if not currently included.

Thanks, Nathaniel

Join Microsoft Teams Meeting

Learn more about Teams | Meeting options Join with a video conferencing device 20014895@t.plcm.vc VTC Conference ID: 1424236355 Alternate VTC dialing instructions



Help

From: Dobson, Suzanne <<u>Suzanne.Dobson@dfo-mpo.gc.ca</u>>
Sent: December 1, 2020 5:25 PM
To: Hancock, Bruce H <<u>Bruce.Hancock@novascotia.ca</u>>
Cc: Williams, Wendy <<u>Wendy.Williams@dfo-mpo.gc.ca</u>>; Feindel, Nathaniel J
<<u>Nathaniel.Feindel@novascotia.ca</u>>; Parker, Edward V <<u>Edward.Parker@dfo-mpo.gc.ca</u>>
Subject: Addendum: Rattling Beach Marine Finfish Aquaculture Site 1039

** EXTERNAL EMAIL / COURRIEL EXTERNE **

Exercise caution when opening attachments or clicking on links / Faites preuve de prudence si vous ouvrez une pièce jointe ou cliquez sur un lien

Hello Bruce,

Please find attached an addendum from Edward Parker to the letter of advice, dated October 11, 2019, that Fisheries and Oceans Canada (DFO) provided to your department on Kelly Cove Salmon Ltd.'s application.

If you have an questions concerning this letter please contact myself or Edward Parker at <u>Edward.Parker@dfo-mpo.gc.ca</u>.

Sue

Suzanne Dobson A/Manager of Aquaculture Management, Maritimes Region <u>Suzanne.Dobson@dfo-mpo.gc.ca</u>

Fisheries and Oceans Canada | Pêches et Océans Canada PO Box 1006, P600, Dartmouth, NS B2Y 4A2 CP 1006, P600, Dartmouth, N-É B2Y 4A2 Government of Canada | Gouvernement du Canada



Addendum to LoA_2018-MarAq-00 1 Challenger Drive, P600 Dartmouth, NS B2Y 4A2

December 1, 2020

DFO File # 2018-MarAq-001

Lynn Winfield, Licensing Coordinator 1575 Lake Road Shelburne, Nova Scotia B0T 1W0

Dear Lynn Winfield:

Subject: Addendum to Letter of Advice Dated October 11, 2019 on Boundary Expansion of Rattling Beach Marine Finfish Aquaculture Site 1039 – Kelly Cove Salmon Ltd.

This is an addendum to the letter of advice, dated October 11, 2019, that Fisheries and Oceans Canada (DFO) provided to your department on Kelly Cove Salmon Ltd.'s application for an amendment to its aquaculture licence under the provincial *Fisheries and Coastal Resources Act*. Kelly Cove Salmon Ltd. is requesting to amend their licence to reflect a change of the boundaries from 8.74 hectares to 29.08 hectares at their existing site near Rattling Beach, Annapolis Basin, Digby County, for the purpose of cultivating Atlantic salmon (Saint John River strain).

The letter of advice summarized the results of our risk assessment to inform your department of the risks posed to fish and fish habitat and identified where additional avoidance and mitigation measures could be applied. Because DFO did not have recent baseline information pre-amendment, our risk assessment was of the site as a whole given that the boundary amendment had already occurred including changes to infrastructure, site location and operations. The letter of advice and accompanying Canadian Science Advisory Secretariat Science Response, which informed DFO's risk assessment, remain as the official advice from DFO.

This addendum is meant to provide additional context related to site specifics and DFO's review process, not initially included. Going forward, all DFO letters of advice will include a broader contextual piece to better situate the letter of advice and its supporting science advice.

DFO's risk management approach for review of the application

DFO's review of the application is focused on the protection of fish and fish habitat and uses a risk management approach to formulate its assessment. The threshold for unacceptable risk to fish and fish habitat is population-level negative effects.

The scope of our review was reflective of our legislative mandate, which includes the *Fisheries Act*, *Species at Risk Act* (SARA), *Oceans Act* and applicable regulations. The residual risk, after avoidance and mitigation measures, was assessed against criteria for unacceptable risk to fish and fish habitat to determine if further risk treatment was needed. Using the precautionary approach,

the amount of risk treatment applied was commensurate with the level of scientific uncertainty and seriousness of residual risk.

DFO employs a series of risk treatment tools to protect fish and fish habitat such as avoidance, mitigation, monitoring, compliance and remediation. Our review also takes into account other regulatory tools employed by other federal and provincial authorities to further protect fish and fish habitat. If DFO had concluded that additional risk treatment was needed, it would have been stated in the letter of advice.

Farm Management Plan

It is DFO's understanding that the Farm Management Plan contains details on operational practices that influence the likelihood of, as well as avoidance and mitigation of, impacts on fish and fish habitat. Having had this information for the specific areas stated in the letter of advice would have enabled a more precise determination of residual risk by DFO, but were not needed as the residual risk was below the threshold of unacceptable impacts.

Issues-specific

Clarification for the following sentence in the letter of advice is offered below: "The proponent provided a predicted exposure zone for biochemical oxygen demanding matter, but not the other 2 classes of deleterious substances (as required by the AAR)."

This sentence could have been worded better to reflect the fact that, in accordance with the *Aquaculture Activities Regulations*, the predicted exposure zone for biochemical oxygen demanding matter is the only one required to be provided by the proponent.

Clarification for the following sentence in the letter of advice is offered below: "DFO Science's assessment of the effects of drugs was not as complete as for pest control products due to scientific uncertainties."

More work has been done on biological effects of pest control products and there is a better understanding of the impacts on the most sensitive species (i.e. non-target crustaceans, juvenile lobster). Less work has been done on the effects of drugs (e.g., does the drug have to be ingested? how long does it persist on the bottom? how quickly does it get buried?) and the CSAS peer-review of this work is not yet complete. There are uncertainties which may be addressed with ongoing work. The intent of this statement was to advise NSDFA of the scientific uncertainty associated with assessing the risk of drugs.

If you have any questions concerning this letter, or if DFO's understanding of the application is either incorrect, incomplete, or if there are changes to the application, please contact me either by telephone at 902-402-0298 or by email at Edward.Parker@dfo-mpo.gc.ca.

Sincerely,

Edward Parker

Senior Advisor, Aquaculture Management Office Maritimes Region

M. McLean, Ecosystem Management, DFO Maritimes
 M. Comley, Southwest Nova Scotia Area Office, DFO Maritimes
 J. Ford, Resource and Aboriginal Fisheries Management, DFO Maritimes
 M. Sullivan, Ecosystem Science, DFO Maritimes
 G. Herbert, Marine Planning and Conservation, DFO Maritimes

From: Feehan, Jennifer
Sent: December 4, 2020 10:00 AM
To: Jeff Nickerson
inickerson@cookeaqua.com>; Jennifer Hewitt @cookeaqua.com>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>; Watts, Melinda <Melinda.Watts@novascotia.ca>;
Feindel, Nathaniel J <Nathaniel.Feindel@novascotia.ca>; Ceschiutti, Robert
<Robert.Ceschiutti@novascotia.ca>
Subject: AQ#1039 DFO Addendum

Hi Jeff and Jennifer,

Please find attached DFO's addendum to the letter of advice dated October 11, 2019 for AQ#1039.

Kind regards, Jennifer

Jennifer Feehan

Aquaculture Advisor Nova Scotia Department of Fisheries and Aquaculture 1800 Argyle Street, 6th Floor WTCC Halifax, NS B3J 2R5 902-237-0771 jennifer.feehan@novascotia.ca



Addendum to LoA_2018-MarAq-00

*Please refer to correspondence above (see December 1, 2020) for the attachment in this email.

APPENDIX B – CANADIAN FOOD INSPECTION AGENCY

From: Winfield, Lynn
Sent: March 20, 2018 2:32 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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R-1039 Amendment - Network Memo &



novascotia.ca

MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Canadian Food Inspection Agency. From: Winfield, Lynn
Sent: March 20, 2018 2:45 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

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All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Winfield, Lynn
Sent: March 21, 2018 9:41 AM
To: 'Angela.Smith@inspection.gc.ca' <Angela.Smith@inspection.gc.ca>
Subject: FW: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good Morning Angela,

Please see the below email sent to Philip Myers yesterday, I apologize that I did not forward it to you as well.

Thanks,

₽)**F**

Lynn



R-1039 Amendment 171009 FINAL - Network Memo & Network Agency Rei

*Please refer to correspondence above (see March 20, 2018) for attachments.

From: Winfield, Lynn

Sent: May 3, 2018 10:38 AM

To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca' <erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>; 'david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'

 Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

To: Winfield, Lynn <Lynn.Winfield@novascotia.ca> **Subject:** RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Hi Please find attached the completed Agency Review document for 1039.

Angela Smith Acting/Regional Program Officer, Shellfish and Food Safety Programs, Operations Branch, Nova Scotia Canadian Food Inspection Agency / Government of Canada <u>angela.smith@inspection.gc.ca</u> / Tel: 902-742-0865 (office) 902-986-1679 (cell)

Agissant/Agent régionale des programmes mollusques et salubrité des aliments (N-É) / Direction générale des Opérations Agence canadienne d'inspection des alimetns / Gouvernement du Canada <u>angela.smith@inspection.gc.ca</u> / Tel: 902-742-0865 (bureau) 902-986-1679 (cell)

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Network Agency Review of an Aquaculture Application

Agency	Canadian Food Inspection Agency
Division (if applicable)	
Reviewer	Angela Smith
Title of Reviewer	Acting Regional Program Officer
Date	May 16, 2018
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- ☑ No concerns regarding the proposed development
- □ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

APPENDIX C – TRANSPORT CANADA

From: Winfield, Lynn
Sent: March 20, 2018 2:58 PM
To: 'NPPATL-PPNATL@tc.gc.ca' <NPPATL-PPNATL@tc.gc.ca>
Subject: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfteld

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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Transport Canada - 171009 FINAL Network Package.pc Network Agency Rev

Å⊨ ₽XF



novascotia.ca

MEMORANDUM

To: Transport Canada, Network Agency

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you confirm that the approval dated January 11, 2017, your file #8200-94-3045 is still valid, please review all components that pertain to this application by **May 22, 2018**. Note: We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Transport Canada.

Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

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From: Winfield, Lynn
Sent: May 3, 2018 10:43 AM
To: 'NPPATL-PPNATL@tc.gc.ca' <NPPATL-PPNATL@tc.gc.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Sent: May 16, 2018 9:09 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: 1039 - Kelly Cove Salmon

Good Morning Lynn,

I just wanted to forewarn you that Transport Canada is preparing a response. The expansion would impact Ferry operations.

Mélanie LeBlanc

Navigation Protection Program Officer Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 | <u>melanie.leblanc@tc.gc.ca</u> / Tel: 506-962-1412

Agente, Programme de la protection de la navigation Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6 <u>melanie.leblanc@tc.gc.ca</u> / Tél. : 506-962-1412



From: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Sent: May 17, 2018 2:45 PM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Cc: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Subject: Re: Aquaculture Amendment Application No. 1039 - Digby County

Good afternoon Lynn,

The Navigation Protection Program has reviewed the submitted documents for the expansion/amendment to the existing aquaculture site lease AQ#1039 located in Annapolis Basin (Rattling Beach), Digby County.

During the review, significant concerns were raised with the expansion in the proximity of the Ferry Terminal. Factoring in tides, weather conditions and drifting of the vessel etc., the expansion, as proposed, would likely interfere with the operational area, especially the turning circle of the ferry. This will increase the risk of collision and damage to both the ferry and aquaculture equipment, as well as, potentially cause ferry service disruptions /cancellations.

Considering the above, the Navigation Protection Program is not willing to approve the expansion toward the ferry terminal. The NPP is willing, however, to consider alternative options the proponent may want to propose.

Do not hesitate to give me a call if you wish to discuss further or if you have questions.

Mélanie LeBlanc

Navigation Protection Program Officer Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 | <u>melanie.leblanc@tc.gc.ca</u> / Tel: 506-962-1412

Agente, Programme de la protection de la navigation Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6 <u>melanie.leblanc@tc.gc.ca</u> / Tél. : 506-962-1412





From: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca> Sent: May 17, 2018 2:48 PM To: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: Re: Aquaculture Amendment Application No. 1039 - Digby County

Hi Melanie

Thanks for the update. I had thought this expansion already had an updated NPP approval in early 2017 that addresses this expansion?

Brennan Goreham Manager, Licensing and Leasing Nova Scotia Department of Fisheries and Aquaculture (P) 902-875-7430 (C) 902-874-2719

From: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Sent: May 22, 2018 5:23 PM
To: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Aquaculture Amendment Application No. 1039 - Digby County

Hi Melanie

Attached is the approved NPP we have on file, which appears to line up with the proposed amendment area.

Brennan Goreham Manager, Licensing and Leasing NS Department of Fisheries and Aquaculture 1575 Lake Road Shelburne, Nova Scotia BOT 1W0

Office: (902) 875-7430 Cell: (902) 874-2719 Fax: (902) 875-7429 Email: brennan.goreham@novascotia.ca

1039- TC Approval.pdf




November 2017

Appendix D – Transport Canada Approval Package

Transport Transports Canada Canada

Navigation Protection Program P.O. Box 42 Moncton, N.B. E1C 8K6

Your file

Our file 8200-94-3045

January 11, 2017

Kelly Cove Salmon Limited C/O Cooke Aquaculture PO Box 1546 Shelburne, NS B0T 1W0

Attention: Jeff Nickerson

RE: Notice to the Minister under the Navigation Protection Act for Approval of an Aquaculture Facility, located at 44" 39' 12.00" N x 065" 45' 22.00" W, Rattling Beach, Annapolis Basin, Annapolis County, In the Province of Nova Scotia

The Minister of Transport has determined under section 5 of the Navigation Protection Act (NPA) that your work is likely to substantially interfere with navigation.

Enclosed please find the Approval for the above-noted work issued by the Minister of Transport in accordance with subsection To Be Determined of the NPA.

This permission relates only to the effect of your work on navigation under the NPA and does not grant any rights related to the ownership of the bed of the waterway.

You are reminded that all buoys must conform to the Federal Private Buoy Regulations.

Please note that the NPA, amongst other obligations, requires the owner to immediately notify the Minister if your work causes or is likely to cause serious or imminent danger to navigation and take reasonable measures to remediate the danger to navigation (section 12 of the NPA).

Should you have any questions, please do not hesitate to contact our office in Moncton by phone at (506) 851-3113, by fax at (506) 851-7542 or by e-mail at NPPATL-PPNATL@tc.gc.ca.

Respectfully.

Mélanie LeBlanc Officer, Navigallon Protection Program Programs Group Transport Canada Atlantic Region

Atlachments

cc: Amanda Daigle - SIMCorp Shaun Allain – SIMCorp Amanda Spencer – Nova Scolia Department of Fisheries and Aquaculture Carrie Brayall - CHS

Canadä

Transport Transports Canada Canada

NAVIGATION PROTECTION ACT Subsection 6(1)

8200-94-3045

Approval

OWNER:	Kelly Cove Salmon Limited C/O Cooke Aquaculture PO Box 1546 Shelburne, NS B0T 1W0
WORK:	Aquaculture Facility
SITE LOCATION:	Located at Approximately 44* 39' 12.00" N x 065* 45' 22.00" W, Rattling Beach, Annapolis Basin, Annapolis County, Province of Nova Scotia, in the Province of Nova Scotia

Regarding the notice and application to the Minister of Transport, submitted pursuant to the *Navigation Protection Act*, for an approval of a work, the Minister hereby approves the placement of the abovedescribed work and the attached plans pursuant to subsection 6(1) in accordance with the following terms and conditions:

- At all times, all anchorage systems, gear and associated work(s), including anchors, are to be contained within the limits of the marked area and not to extend beyond these boundaries.
- Buoy markings to be installed and maintained as per Transport Canada conditions outlined on the enclosed Site-specific Marking Plan and Aquaculture Buoy Standard Sheets, at all times aquaculture gear Is in the water.
- 3. In the event that any material or equipment drifts for any reason, it is to be marked immediately with a flashing cautionary light and radar reflector and removed from the waterway or returned to its original location as soon as possible. The Canadian Coast Guard, Marine Communications and Traffic Services (MCTS) Sydney at (902) 564-7751 or toll-free 1-800-686-8676 is to be advised in order to allow for appropriate Notices to Shipping/Mariners action.

SIGNED in two copies on _____ in Moncton, N.B.

Mélanle LeBlanc Navigation Protection Program Officer Programs Group Transport Canada Atlantic Region For the Minister of Transport

Canadä



















Schedule A GPS COORDINATE INFORMATION SHEET

Proposed Expansion #: 1039x

Applicant:	Kelly Cove Salmon Ltd.		
Location:	Annapolis Basin	County:	Digby
Hydrographic Chart:	4396	Orthophoto #	ŧ:
Dimensions of site:	Approx. 190m x 180m x 720m x 370m 625m x 282m	Size:	Approx. 29.10 ha.

Approximate Coordinates of Application:

Datum used:			NAD 83	3		
Centre coordina	tes (Appi	rox.)	Lat. Long.	44° 39' 12.68' -65° 45' 18.47	"	
Corner #1	Lat. Long.	44° 39' 27.69" -65° 45' 24.29"		Corner #2	Lat. Long.	44° 39' 28.17" -65° 45' 15.70"
Corner #3	Lat. Long.	44° 39' 22.82" -65° 45' 12.46"		Corner #4	Lat. Long.	44° 38' 59.59" -65° 45' 09.59"
Corner #5	Lat. Long.	44° 38' 58.53" -65° 45' 26.32'	,	Corner #5	Lat. Long.	44° 38' 58.53" -65° 45' 26.32"

Note: The coordinates and dimensions for this site have been taken from the survey.





From: LeBlanc, Mélanie [melanie.leblanc@tc.gc.ca]
Sent: May-23-18 2:54 PM
To: Goreham, Brennan CD
Cc: Winfield, Lynn; Ripley, Carl
Subject: RE: Aquaculture Amendment Application No. 1039 - Digby County

Good Morning Brennan and Lynn,

The approval issued in January 2017 is valid, which was issued following findings on a site visit where gear was outside the original lease.

We have received notice from the Ferry operators that the proximity of the aquaculture site could be problematic depending on weather conditions and tides.

I have verified with Kelly Cove and the gear that is in the water is what was approved in 2017 and marked as such.

All that being said, with the information received from the ferry operators, and after talking with Sweeney International (Kelly Cove), we <u>may be</u> open to amend the conditions to add a no gear zone in the North Eastern corner of the proposed lease, but that would remove a buoy from a lease corner which would maybe cause an issue with the provincial legislation.

Mélanie LeBlanc

Canada

Navigation Protection Program Officer

Canada

Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 | <u>melanie.leblanc@tc.gc.ca</u> / Tel: 506-962-1412 Agente, Programme de la protection de la navigation Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6 <u>melanie.leblanc@tc.gc.ca</u> / Tél. : 506-962-1412 Transport Transport

From: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Sent: May 23, 2018 2:58 PM
To: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>; Ripley, Carl <carl.ripley@tc.gc.ca>
Subject: RE: Aquaculture Amendment Application No. 1039 - Digby County

Thanks Melanie. Would you folks be open to arranging a telephone call with KCS/Sweeney to discuss options?

Brennan Goreham Manager, Licensing and Leasing NS Department of Fisheries and Aquaculture 1575 Lake Road Shelburne, Nova Scotia BOT 1W0

Office: (902) 875-7430 Cell: (902) 874-2719 Fax: (902) 875-7429 Email: <u>brennan.goreham@novascotia.ca</u>

From: Ripley, Carl <carl.ripley@tc.gc.ca>
Sent: May 23, 2018 3:07 PM
To: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>; LeBlanc, Mélanie
<melanie.leblanc@tc.gc.ca>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Aquaculture Amendment Application No. 1039 - Digby County

Now that we have confirmed that the gear in the water is what was approved in 2017 and marked as such, we are going to follow-up with the ferry operator to confirm if they are having any difficulties with the current configuration and location (we haven't received any complaints to date)

We'll circle back to you shortly.

-C

From: LeBlanc, Mélanie <melanie.leblanc@tc.gc.ca>
Sent: August 15, 2018 4:37 PM
To: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Cc: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: Rattling Beach (#1039) / 8200-94-3045

Good afternoon Brennan / Lynn,

To follow up with lease 1039, I have spoken to the Ferry Operator/Master of the Fundy Rose and they are ok with what is there now, which is the proposed alteration to the lease.

To add, Kelly Cove has offered to meet with the ferry operator to which I have extended the invitation to them. The ferry operator have not requested a meeting.

Therefore there are no issues with the proposed (existing) alteration.

Mélanie LeBlanc

Navigation Protection Program Officer Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 | <u>melanie.leblanc@tc.gc.ca</u> / Tel: 506-962-1412

Agente, Programme de la protection de la navigation Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6 <u>melanie.leblanc@tc.gc.ca</u> / Tél. : 506-962-1412



APPENDIX D – ENVIRONMENT & CLIMATE CHANGE CANADA – CANADIAN SHELLFISH SANITATION PROGRAM

From: Winfield, Lynn
Sent: March 20, 2018 2:32 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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R-1039 Amendment - Network Memo &



novascotia.ca

MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Environment & Climate Change Canada – Canadian Shellfish Sanitation Program. From: Winfield, Lynn
Sent: March 20, 2018 2:45 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Qynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
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- □ Request additional information (described below)
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In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Winfield, Lynn
Sent: May 3, 2018 10:38 AM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>; 'david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>; 'Angela.Smith@inspection.gc.ca>
<shane.hood@inspection.gc.ca' <shane.hood@inspection.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: MacArthur, David (EC) <david.macarthur@canada.ca>
Sent: May 4, 2018 9:26 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

David MacArthur

Senior Biologist, Canadian Shellfish Sanitation Program - Atlantic Environment & Climate Change Canada / Government of Canada <u>david.macarthur@canada.ca</u> / Tel: 902-426-6296 / Fax: 902-426-8041 Biologiste Principal, Programme canadien de contrôle de la salubrité des mollusques - Atlantique Environnement & Changement Climatique Canada / Gouvernement du Canada <u>david.macarthur@canada.ca</u> / Tél: 902-426-6296 / Téléc: 902-426-8041



Network Agency Review of an Aquaculture Application

Agency	ECCC
Division (if applicable)	
Reviewer	David MacArthur
Title of Reviewer	Area Coordinator
Date	May 4, 2018
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \boxtimes No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: MacArthur, David (EC) <david.macarthur@canada.ca>
Sent: October 19, 2018 12:31 PM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

David MacArthur

Senior Area Coordinator, Shellfish Water Classification Program - Atlantic Environment & Climate Change Canada / Government of Canada <u>david.macarthur@canada.ca</u> / Tel: 902-426-6296 / Fax: 902-426-8041 Coordonnateur Principal Zone, Programme de Classification des Eaux Coquillieres - Atlantique Environnement & Changement Climatique Canada / Gouvernement du Canada <u>david.macarthur@canada.ca</u> / Tél: 902-426-6296 / Téléc: 902-426-8041



Application 1039 -DMacArthur ECCC.d

Network Agency Review of an Aquaculture Application

Agency	ECCC
Division (if applicable)	SWCP
Date	Oct 19, 2018
File No.	1039
Type of application	
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- □ Request meeting with applicant and NSDFA (described below)
- \boxtimes No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

This is outside my area of expertise. No comment.

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

APPENDIX E – ENVIRONMENT & CLIMATE CHANGE CANADA – CANADIAN WILDLIFE SERVICE

From: Winfield, Lynn
Sent: March 20, 2018 2:32 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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R-1039 Amendment - Network Memo &



novascotia.ca

MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Environment & Climate Change Canada – Canadian Wildlife Service. From: Winfield, Lynn
Sent: March 20, 2018 2:45 PM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>;
'david.macarthur@ec.gc.ca' <david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Qynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):
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From: Winfield, Lynn
Sent: May 3, 2018 10:38 AM
To: 'Cheryl.Brooking@dfo-mpo.gc.ca' <Cheryl.Brooking@dfo-mpo.gc.ca>; 'erin.laking@dfo-mpo.gc.ca'
<erin.laking@dfo-mpo.gc.ca>; 'philip.myers@inspection.gc.ca' <philip.myers@inspection.gc.ca>; 'david.macarthur@ec.gc.ca>; 'rachel.gautreau@ec.gc.ca'
<rachel.gautreau@ec.gc.ca>; 'Angela.Smith@inspection.gc.ca>
<shane.hood@inspection.gc.ca' <shane.hood@inspection.gc.ca>
Subject: RE: Boundary Amendment - Site 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Gautreau, Rachel (EC) <rachel.gautreau@canada.ca>
Sent: May 23, 2018 10:08 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Cc: Hanson, Al (EC) <al.hanson@canada.ca>; Mailhiot, Joshua (EC) <joshua.mailhiot@canada.ca>
Subject: Boundary amendment of existing aquaculture lease #1039 - Digby County, N.S.

Hi Lynn,

Environment and Climate Change Canada's Canadian Wildlife Service has reviewed the proposed amendment to the existing aquaculture lease/license #1039 to change the boundaries and increase the size of the lease, located in Annapolis Basin (Rattling Beach), Digby County, Nova Scotia, and we have the following comments:

- On page 1, the proponent states that "KCS has implemented policies and procedures to manage their farms and protect wildlife". These policies and procedures are not further discussed in the document submitted for review. Further details should be provided.
- On page 76, the proponent refers to a Wildlife Interaction Plan which "... outlines all control measures and special requirements as they relate to wildlife encounters at the site. Birds are specifically addressed in the WIP." The Wildlife Interaction Plan was not included in the document submitted for review. This document should be provided.

- The References section appears to have been omitted from the document submitted for review. The References section should be provided.
- It should be clarified whether grow lights are proposed for this site. Bright lights can cause problems for night migrating birds and night-flying seabirds (e.g. storm-petrels), especially during periods of fog, drizzle, and haze. A powerful pencil of light shining upwards into the fog can appear as a corridor through darkness into which the birds fly. Birds then get killed or injured by flying into the lit object, by flying into the light itself, or by colliding with other birds. For those that don't get killed or injured but flutter in the light pencil for a long period, they may deplete their energy reserves and either die of exhaustion or drop to the ground where they are at risk from predators. In order to avoid impacts on migratory birds, it is recommended that lights be shielded and aimed downwards.
- On page 95, it is stated that "... if a predator cannot be deterred and is threatening the security of the containment, it may be dispatched in accordance with Government Policy and Saltwater Management consent." The proponent should clarify its measures to deal with migratory birds that are potential predators of fish, keeping in mind its obligations under the *Migratory Birds Convention Act* and associated regulations.

We will be in a better position to comment on the proposal once the information requested above has been submitted. In the meantime, we have the following comments in the event that the project is ultimately approved:

- Food scraps and other garbage left on beaches and other coastal habitat can artificially enhance the populations of avian and mammalian predators of eggs and chicks of migratory birds. A similar effect could occur if gulls are attracted and have access to excess feed. The proponent should ensure that no litter (including food wastes) is left in coastal areas staff and/or contractors. Also the feed program should be managed to minimize waste, and should include use of tarps to prevent bird access to fish feed.
- Project staff/contractors and vessels should not approach concentrations of seabirds, waterfowl or shorebirds.
- Project staff/contractors should use well muffled vessels.
- Beaches and wetlands are sensitive habitats and proponents should not utilize these habitats for construction, operational or decommissioning activities, with the exception of beach clean-up activities, which should be timed to not coincide with sensitive periods for breeding birds and other wildlife.
- Since even small spills of oil can have very serious effects on migratory birds, every effort should be taken to ensure that no oil spills occur. The proponents should ensure that all precautions are taken by the contractors and staff to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared.

Applicable Legislation

The *Migratory Birds Convention Act* (MBCA) protects most bird species in Canada however, some families of birds are excluded. A list of species under MBCA protection can be found at https://ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1.

Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

"5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds."

It is the responsibility of the proponent to ensure that activities comply with the MBCA and regulations. In fulfilling its responsibility for MBCA compliance, the proponent should take the following points into consideration:

- Information regarding regional nesting periods can be found at <u>http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1</u>. Some species protected under the MBCA may nest outside these timeframes
- Most migratory bird species construct nests in trees (sometimes in tree cavities) and shrubs, but several species nest at ground level (e.g., Common Nighthawk, Killdeer, sandpipers), in hay fields, pastures or in burrows. Some bird species may nest on cliffs or in stockpiles of overburden material from mines or the banks of quarries. Some migratory birds (including certain waterfowl species) may nest in head ponds created by beaver dams. Some migratory birds (e.g., Barn Swallow, Cliff Swallow, Eastern Phoebe) may build their nests on structures such as bridges, ledges or gutters.
- One method frequently used to minimize the risk of destroying bird nests consists of avoiding certain activities, such as clearing, during the regional nesting period for migratory birds.
- The risk of impacting active nests or birds caring for pre-fledged chicks, discovered during project activities outside the regional nesting period, can be minimized by measures such as the establishment of vegetated buffer zones around nests, and minimization of activities in the immediate area until nesting is complete and chicks have naturally migrated from the area. It is incumbent on the proponent to identify the best approach, based on the circumstances, to complying with the MBCA.

Further information can be found at <u>http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=C51C415F-1</u>

The proponent should also be reminded that the prohibitions under the *Species at Risk Act* (SARA) are now in force. The complete text of SARA, including prohibitions, is available at <u>www.sararegistry.gc.ca</u>.

Please do not hesitate to contact me should you have any questions regarding our comments.

Sincerely,

Rachel

Rachel Gautreau

Coordinator, Environmental Assessment / Canadian Wildlife Service Environment and Climate Change Canada / Government of Canada rachel.gautreau@canada.ca / +1-506-364-5028

Coordinatrice, Évaluations environnementales / Service canadien de la faune Environnement et Changement climatique Canada / Gouvernement du Canada <u>rachel.gautreau@canada.ca</u> / +1-506-364-5028

From: Winfield, Lynn
Sent: June 22, 2018 10:53 AM
To: 'Gautreau, Rachel (EC)' <rachel.gautreau@canada.ca>
Cc: Hanson, Al (EC) <al.hanson@canada.ca>; Mailhiot, Joshua (EC) <joshua.mailhiot@canada.ca>
Subject: RE: Boundary amendment of existing aquaculture lease #1039 - Digby County, N.S.

Good Morning Rachel;

Further to your email of May 23, 2018, I provide the attached additional information for your review.

Can you please provide your additional comments by **July 6, 2018**, for your convenience I have attached the Network Agency Review Form.

Thanks,

Lynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture PF Appendix E - References for KCS 171009 FINAL Wildlife Interaction AQ#1039.pdf Network Agency Rei

*Please refer to correspondence above (see March 20, 2018) for attachment #3.



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Appendix E – Wildlife Interaction Plan

Wildlife Interaction Plan

for Salmon Farms in North America

Cooke Aquaculture Inc.

This Wildlife Interaction Plan (WIP) has been created to meet the requirements for Section 7 Environment – Predator and Wildlife Interactions of the Best Aquaculture Practices (BAP) Salmon Farms Standard. The guidance and practice herein have and will continue to be followed by all North American employees of Cooke Aquaculture who are employed in the Saltwater Division and those who directly interact with the salmon farms. This plan merely acts as an overall summary of the current requirements that each salmon farm must follow and in the effect of any conflict of information or direction between this document and the requirements, the requirements will prevail.

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Appendix 3 – Acoustic Deterrent Policy

Section 1; Local Laws and Regulations for Wildlife Management and Protection

- 1.1 Canadian Federal Legislation
 - **1.1.1 Species At Risk Act (SARA), 2002** The purposes of this Act are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.¹
 - **1.1.2** Fisheries Act, 2012 Established to manage and protect Canada's fisheries resources. It applies to all fishing zones, territorial seas and inland waters of Canada and is binding to federal, provincial and territorial governments.² Subsection 35(1) is a general prohibition of harmful alteration, disruption or destruction (HADD) of fish habitat.³
 - **1.1.3** Aquaculture Activities Regulations, 2015 Fisheries and Oceans Canada has developed the Aquaculture Activities Regulations (AAR), to clarify conditions under which aquaculture operators may treat their fish and deposit organic matter, while ensuring the protection of fish and fish habitat and sector sustainability. The Regulations are designed to align with policies and regulatory regimes that already exist in provincial and other federal jurisdictions through codification of these measures, while providing further clarification with the addition of AAR-specific conditions. Reconciling and clarifying aquaculture-related regulations will improve coherence, simplicity and accountability. The Regulations will also increase operational certainty across Canada, improve environmental protection, and increase reporting with the intention of strengthening public confidence.⁴
 - **1.1.4** Health of Animals Act, 2015 The Canadian Food Inspection Agency may, for the purposes of fish pathogen or pest control and the Health of Animals Act, deposit a deleterious substance as defined in the AAR.⁵
 - **1.1.5** Canadian Environmental Assessment Act, 2012 CEAA is an environmental assessment focused on potential adverse environmental effects that are within federal jurisdiction, including: fish and fish habitat; other aquatic species; migratory birds; federal lands; effects that cross provincial or international boundaries; effects that impact on Aboriginal peoples, such as their use of lands and resources for traditional purposes; changes to the environment that are directly linked to or necessarily incidental to any federal decisions about a project. If there is a Provincial requirement for an environmental assessment or review, the applicant has an exemption form the CEAA.⁶
 - **1.1.6 Oceans Act, 1997** Canada made a legal commitment to conserve, protect and develop the oceans in a sustainable manner.⁷
 - 1.1.7 Migratory Birds Convention Act, 1994 Protecting and conserving Migratory Birds
 - **1.1.8** Canadian Environmental Protection Act, 1999 An Act respecting pollution prevention and the protection of the environment and human health in order to contribute to sustainable development.⁸
 - **1.1.9** Marine Mammal Regulations, 2010 These Regulations apply in respect of the management and control of (a) fishing for marine mammals and related activities in Canada or in Canadian fisheries waters; and (b) fishing for marine mammals from Canadian fishing vessels in the Antarctic.⁹

1 Species at Risk Act (S.C. 2002, c. 29), Section 6 – "Purposes"

- 2 http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14151-eng.htm
- 3 http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14151-eng.htm
- 4 http://www.dfo-mpo.gc.ca/acts-lois/rules-reglements/rule-reglement06-eng.htm
- 5 Aquaculture Activities Regulations, SOR/2015-177, Section 17 (2) "Canadian Food Inspection Agency"
- 6 Canadian Environmental Assessment, 2012 Section 37 "Exemption"
- 7 http://www.dfo-moo.gc.ca/oceans/management-gestion/governmentsrole-roledespouvernements/index-eng.htm
- 8 Canadian Environmental Protection Act, 1999, c. 33, Section "Introduction"
- 9 Marine Mammal Regulations, Current to April 28, 2010, Section 3 "Application"

Wildlife Interaction Plan

for Salmon Farms in North America

1.2 Canadian Provincial Legislation

1.2.1 New Brunswick

- **1.2.1.1 Species At Risk Act (SARA), 2012** "The purposes of this Act are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened."¹
- **1.2.1.2** NB Fish and Wildlife Act, 1980 "This Act applies to all hunting and angling and rights of hunting and angling, and all matters relating thereto, except that this Act, and any lease, licence, permit or regulation issued or made hereunder, shall not authorize or be deemed to authorize any interference with the navigation of any navigable water."²
- **1.2.1.3** NB Crown Lands and Forests Act, 1980 "The Minister is responsible for the development, utilization, protection and integrated management of the resources of Crown Lands, including habitat for the maintenance of fish and wildlife populations."³
- **1.2.1.4** NB Clean Environment Act, 1973 "The Clean Environment Act contains many regulations that are centred on dealing with materials and actions that can contaminate the physical environment. It includes above and below surface level."⁴
- **1.2.1.5** NB Clean Water Act, 1989 Governs water quality in the Province of New Brunswick
- **1.2.1.6** NB Clean Air Act, 1997 "The purpose of this Act and the regulations is to support and promote the protection, restoration, enhancement and wise use of the environment..."⁵

1 Species at Risk Act (S.N.B. 2012, c. 6), Section "Purposes"

- 2 Fish and Wildlife Act (S.N.B. 1980, c. F+14.1), Section 2
- 3 Crown Lands and Forests Act, SNB 1980, c C-38., Section "General Administration"
- 4 <u>http://en.wikipedia.org/wiki/New_Brunswick_environmental_legislation</u>
- 5 Clean Air Act, SNB 1997, c C-5.2, Section "Purpose of Act and Regulations"

1.2.2 Nova Scotia

- **1.2.2.1** Wildlife Act, 1989 Develop and implement policies and programs for wildlife designed to maintain diversity of species at levels of abundance to meet management objectives¹
- **1.2.2.2 Endangered Species Act, 1998** The purpose of this Act is to provide for the protection, designation, recovery and other relevant aspects of conservation of species at risk in the Province, including... habitat protection²
- **1.2.2.3** Special Places Protection Act, 1989 Provide for the preservation, protection, regulation, acquisition and study of ecological sites which are considered important parts of the natural heritage of the Province.³
- **1.2.2.4** Fisheries and Coastal Resource Act, 1996 This act is the primary piece of legislation for the Department of Fisheries and Aquaculture. It gives authority for most of the Department's functions and activities. These include: recreational fishing, sea plant harvesting, training and development, licensing of buyers and processors, aquaculture, the Fisheries and Aquaculture Loan Board, and enforcement.⁴
- **1.2.2.5** Aquaculture Regulations, 2015 Regulations under the Fisheries and Coastal Resource Act for the management and development of the aquaculture industry specifically regarding aquaculture management and licensing.
- 1 Wildlife Act. R.S., c. 504, s. 2., Section 2 "Object and Purpose"

- 3 Special Places Protection Act. R.S., c. 438, s. 1, Section 2
- 4 http://novascotla.ca/fish/aquaculture/laws-regs/

² NS Endangered Species Act, Section 2

1.2.3 Newfoundland

- **1.2.3.1** NL Endangered Species Act, 2001 "Provides special protection for plant and animal species considered to be endangered, threatened, or vulnerable in the province..."¹
- **1.2.3.2** Wilderness and Ecological Reserves Act, 1990 "An act to provide for the natural areas in the province to be set aside for the benefit, education and enjoyment of the people of the province."²
- 1 http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/
- 2 Wilderness and Ecological Reserves Act, "subtitle"

1.3 United States Federal Legislation

- **1.3.1** The Migratory Bird Treaty Act of 1918 (Title 16 U.S. Code Sections 703 to 711) Wildlife Protection
- 1.3.2 Endangered Species Act (Title 16 U.S. Code Sections 1531 to 1544) Wildlife Protection
- **1.3.3** Clean Water Act (Title 33 U.S. Code Sections 1251 to 1376) Indirectly protects wildlife, protects habitat
- 1.3.4 Coastal Zone Management Act (Title 16 U.S. Code Sections 1451 to 1464) Indirectly protects wildlife, protects habitat
- **1.3.5** Nonindigenous Aquatic Nuisance Prevention and Control Act (Title 16 U.S. Code Sections 4701 to 4751) Indirectly protects wildlife, protects habitat
- **1.3.6** Federal Agricultural Improvement and Reform Act of 1996 (Public Law No. 104-127) Indirectly protects wildlife, protects habitat
- 1.4 State of Maine Legislation
 - 1.4.1 Maine Endangered Species Act (Title 12 M.R.S.A Sections 7751 to 7759) Wildlife protection
 - **1.4.2** Natural Resources Protection Act (Title 38 M.R.S.A Section 480) Indirectly protects wildlife, protects habitat
 - **1.4.3** Coastal Management Policy (Title 38 M.R.S.A Sections 1801 to 1803) Indirectly protects wildlife, protects habitat
 - **1.4.4** Shoreland Zoning Ordinance (Title 38 M.R.S.A. Sections 435 to 447) Indirectly protects wildlife, protects habitat
 - **1.4.5** Maine's Rivers Law (Title 12 M.R.S.A. Sections 401 to 407) Indirectly protects wildlife, protects habitat
 - **1.4.6** Water Pollution Control Law (Title 38 M.R.S.A. Sections 411 to 424) Indirectly protects wildlife, protect habitat
 - 1.4.7 Interstate Water Pollution Control (Title 38 M.R.S.A. Sections 491 to 501)

Section 2; Specific Conditions of Operating Permits for Wildlife Management and Protection

2.1 New Brunswick

- 2.1.1 License: Schedule A Operating Terms and Conditions; this license may be suspended or revoked should the licensee fail to comply with the *Clean Water Act*, the *Clean Environment Act*, the *Crown Lands and Forests Act*, the *Public Health Act*, the *Seafood Processing Act*, the *Fish and Wildlife Act*, the Federal *Fisheries Act*, the Federal *Navigable Waters Protection Act*, or any other applicable law.
- 2.1.2 Approval to Operate: Schedule A; the Approval Holder, operator or any person in charge of the Facility shall immediately report to the New Brunswick Department of the Environment where: (a) There has been, or is likely to be, an unauthorized release of solid, liquid or gaseous material including wastewater, petroleum or hazardous materials, to the environment; (b) There has been a violation of the Air Quality Regulation, the Water Quality Regulation or any Approval issued thereunder; or (c) A release of a contaminant or contaminants is of such magnitude or period that there is concern for the health or safety of the general public, or there could be significant harm to the environment. The Approval Holder shall operate the facility in compliance with the Water Quality Regulation Clean Environment Act. #11. This Certificate of Approval does not relieve the Approval Holder from complying with municipal bylaws, other provincial acts and regulations, or any federal acts and regulations. An Inspector, at any reasonable time, has the authority to inspect the Facility and carry out such duties as defined in the Clean Air Act, the Clean Environment Act or the Clean Water Act.

2.2 Nova Scotia

2.2.1 Lease & License: Any undertakings required by Schedule "B" to this license, and any permits, protocols, approvals, licenses or permissions which may be required under the laws of the Province or Canada form part of this Agreement, and the Licensee hereby agrees to comply with any conditions or limitations contained in these requirements unless compliance for licensing purposes is expressly waived by the Minister.

2.3 Newfoundland

- **2.3.1** Lease: Schedule C; the use of the demised premises will, for its intended purpose, be subject to and in accordance with all provincial acts and regulations respecting the promotion of efficient aquaculture and environmental control.
- **2.3.2** License: The proponent is required to complete, on an annual basis, a DFO Finfish Aquaculture Farm Monitoring Report for Fish Habitat.
- 2.3.3 Water Use Permit: The Licensee/Holder shall not impair, pollute or cause to be polluted the quality of water.

- 2.4 Maine
 - 2.4.1 DMR Lease: DMR Rule Chapter 2.37; Area Resources (Essential Habitats/Endangered Species) Under the Maine Endangered Species Act a state agency or municipal government shall not permit, license, fund or carry out projects occurring partly or wholly within the Essential Habitat, without the approval of the Commissioner of MDIFW. Applicants are required to provide a signed statement to confirm the proposed lease either does not fall within the boundary of an Essential Habitat or that the applicant has contacted MDIF&W and preliminary review will grant approval for the MDMR to issue an aquaculture lease within part or the entire boundary of a designated Essential Habitat. No nuisance shall be permitted to exist on the leased premises. Lessee shall not operate in such a fashion as to be detrimental to public health, personal property or marine resources, or as to create a serious threat to the marine environment.
 - 2.4.2 ACOE Permit: Appendix C; Special Conditions which are intended to minimize potential impact to Atlantic salmon, Atlantic salmon critical habitat, other fisheries, benthic habitat, and local water quality.
 - 2.4.3 DEP Permit: PART II.1.1-8 (Protection of Atlantic Salmon)

Section 3; Local Endangered or Threatened Species

3.1 Canada

Prior to 2012 there were two parallel environmental assessment processes for new aquaculture sites and for sites applying for boundary amendments: one federally referred to as CEAA (Canadian Environmental Assessment Act); and, a second provincial process. The provincial environmental assessments are required by the following acts: New Brunswick - NB Aquaculture Act and the Clean Environment Act; Nova Scotia - NS Marine and Coastal Resources Act; and, Newfoundland - NL Aquaculture Act. In June 2012 the federal government passed Bill C-38 that essentially ended the requirement for aquaculture sites to go through the Federal CEAA process.

Nonetheless, each Provincial government continues to require an environmental assessment or review. The purpose of Environmental Assessments (EA) is to decide whether or not the aquaculture site will cause adverse significant environmental effects. Items that are assessed include the following: site location and infrastructure; local resources; physical environment; biological environment; description of benthos; fish health; production; public consultation; ancillary information; and socio-economic environment. Critical and sensitive habitats are assessed within the biological environment section. If the aquaculture site is approved, the EA may also set out mitigation measures that must be implemented in order to avoid or minimize impact on the environment.

3.2 Maine

Refer to section 2.4.

Section 4; Map of Sensitive Areas

4.1 National Wildlife Areas and Migratory Bird Sanctuaries in New Brunswick



National Wildlife Areas

No.	Name	Year established	Size in hectares	Notes
1	Cape Jourimain NWA	1980	662	
2	Portage Island NWA	1979	349	•
3	Portobello Creek NWA	1995	2,154	part of Lower St. John River (Sheffield/Jemseg) IBA
4	Shepody NWA	1980	1,069	part of <u>Mary's Point Ramsar Site</u> part of <u>Shepody Bay West IBA</u> part of <u>Bay of Fundy WHSRN</u>
5	Tintamarre NWA	1977	1,941	
-	Total:		6,175	કાઉની

This table provides information on migratory bird sanctuaries such as the name of sanctuary, the year it was established, the size in hectares and notes.

Migratory	/ Bird	Sanctuaries
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No.	Name	Year established	Size in hectares	Notes
1	Grand Manan MBS	1931	433	• part of Grand Manan Archipelago IBA
2	Inkerman MBS	1998	16	part of <u>Pointe aux Rats MusquesHeronry IBA</u>
3	Machias Seal Island MBS	1944	1,046	• part of Machias Seal Island IBA
	Total:		1,495	

4.2 National Wildlife Areas and Migratory Bird Sanctuaries in Nova Scotia







Photo: A. NacPherson © Environment Canada Bott Island NWA.

Migratory Birds Sanctuary



Photo: Julie Paquet © Environment Canada Amherst Point MBS:

Nova Scotia		
NWA Name	Year established	Size in hectares
Boot Island NWA	1979	107
John Lusby Marsh NWA	1982	552
Chignecto NWA	1978	432
Sand Pond NWA	1977	531
Sea Wolf Island NWA	1982	76
Wallace Bay NWA	1980	702

Nova Scotia		
MBS Name	Year established	Size in hectares
Amherst Point MBS	1947	432
Big Glace Bay Lake MBS	1939	393
Port Hebert MB5	1980	346
Kentville MBS	1939	506
Port Joli MBS	1941	397
Sable River MBS	1941	313
Sable Island MBS	1977	3,100
Haley Lake MBS	1941	95

4.3 Wilderness and Ecological Reserves of Newfoundiand and Labrador



4.4 Critical Atlantic Salmon Habitat in Maine



Atlantic Salmon Critical Habitat

Section 5; Risk Assessment

5.1 Canadian Aquaculture Sites and the Species At Risk Act (SARA)

The Species At Risk Act is a key federal government commitment "to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened."¹ SARA provides for the legal protection of wildlife species and the conservation of their biological diversity.

When creating New Site and Boundary Amendment Applications, endangered, at risk and threatened species that have been or may be found in the area of the site have to be identified. For some species it is easy to determine whether or not they would be found in the area, for others it has to be assumed they could be found there as the limited available data does not state otherwise. Species listed under the Federal SARA (Species At Risk Act) designation must be protected.

1. Species at Risk Act (S.C. 2002, c. 29), Section 6 - "Purposes"

5.1.1 Endangered Species - Canada

- New Brunswick SARA list Appendix 1 A
- Nova Scotia SARA list Appendix 1 B
- Newfoundland SARA list Appendix 1 C

5.2 United States Aquaculture Sites and the Maine Endangered Species Act

The Maine Endangered Species Act provides the Maine Department of Inland Fisheries and Wildlife (MDIFW) with a mandate to conserve all of the species of fish and wildlife found in the State, as well as the ecosystems upon which they depend.

Under the Maine Endangered Species Act, as stated in Maine aquaculture site DMR Leases, a state agency or municipal government shall not permit, license, fund or carry out projects occurring partly or wholly within the Essential Habitat, without the approval of the Commissioner of MDIFW.

Applicants are required to provide a signed statement to confirm the proposed lease either does not fall within the boundary of an Essential Habitat or that the applicant has contacted MDIFW and preliminary review will grant approval for the Maine Department of Marine Resources (MDMR) to issue an aquaculture lease within part or all of the boundary of a designated Essential Habitat.

5.2.1 Endangered Species - Maine

The following species are listed as endangered or threatened in Maine:

- F = Federally Endangered under the U.S. Endangered Species Act
- **f = federally threatened under the U.S. Endangered Species Act**
- S= State Endangered under the Maine Endangered Species Act
- s = state threatened under the Maine Endangered Species Act

Beetles

1 American Burying Beetle (Nicrophorus americanus) F

Birds

- 2 American Pipit (Anthus rubescens) (Breeding population only) S
- 3 Arctic Tern (Sterna paradisaea) s
- 4 Atlantic Puffin (Fratercula arctica) s
- 5 Barrow's Goldeneye (Buchephala islandica) s
- 6 Black-crowned Night Heron (Nycticorax nycticorax) s
- 7 Black Tern (Chlidonias niger) S
- 8 Common Moorhen (Gallinula chloropus) s
- 9 Eskimo Curlew (Numenius borealis) F
- 10 Golden Eagle (Aquila chrysaetos) S
- 11 Grasshopper Sparrow (Ammodramus savannarum) S
- 12 Great Cormorant (Phalacrocorax carbo) (Breeding population only) s
- 13 Harlequin Duck (Histrionicus histrionicus) s
- 14 Least Bittern (Lxobrychus exilis) S
- 15 Least Tern (Sterna antillarum) S
- 16 <u>Peregrine Falcon</u> (Falco peregrinus) (Breeding population only) S
- 17 Piping Plover (Charadrius melodus) S f
- 18 Razorbill (Alca torda) s
- 19 Roseate Tern (Sterna dougallii) S F
- 20 Sedge Wren (Cistothorus platensis) S
- 21 Short-eared Owl (Asio flammeus) (Breeding population only) s
- 22 Upland Sandpiper (Bartramia longicauda) s

Fish

- 23 Atlantic Salmon (Salmo salar) F
- 24 Redfin Pickerel (Esox americanus americanus) S
- 25 Shortnose Sturgeon (Acipenser brevirostrum) F
- 26 Swamp Darter (Etheostoma fusiforme) s

Invertebrates

Butterflies and Skippers

- 27 Clayton's Copper (Lycaena dorcas claytoni) S
- 28 Edwards' Hairstreak (Satyrium edwardsii) S
- 29 Hessel's Hairstreak (Callophrys hesseli) S
- 30 Juniper Hairstreak (Callophrys gryneus) S
- 31 Karner Blue (Lycaeides melissa samuelis) F
- 32 Katahdin Arctic (Oeneis polixenes katahdin) S
- 33 Purple Lesser Fritillary (Boloria chariclea grandis) s
- 34 Sleepy Duskywing (Erynnis brizo) s

Dragonflies and Damselflies

- 35 Boreal Snaketail (Ophiogomphus colubrinus) s
- 36 Rapids Clubtail (Gomphus quadricolor) S
- 37 Ringed Boghaunter (Williamsonia lintneri) s

Freshwater Mussels

- 38 Brook Floater (Alasmidonta varicosa) s
- 39 Tidewater Mucket (Leptodea ochracea) s
- 40 Yellow Lampmussel (Lampsilis cariosa) s

Mayflies

- 41 Flat-headed Mayfly (Roaring Brook Mayfly) (Epeorus frisoni) S
- 42 Tomah Mayfly (Siphlonisca aerodromia) s

Moths

- 43 Pine Barrens Zanclognatha (Zanclognatha martha) s
- 44 <u>Twilight Moth</u> (Lycia rachelae) s

Mammals

- 45 Canada Lynx (Lynx canadensis) f
- 46 Eastern Cougar (Felis concolor couguar) F
- 47 Finback Whale (Balaenoptera physalus) F
- 48 Gray Wolf (Canis lupus) F
- 49 Humpback Whale (Megaptera novaeangliae) F
- 50 New England Cottontail (Sylvilagus transitionalis) S
- 51 Northern Bog Lemming (Synaptomys borealis) s
- 52 Northern Right Whale (Eubalaena glacialis) F
- 53 Sei Whale (Balaenoptera borealis) F
- 54 Sperm Whale (Physeter catodon) F

Reptiles

Snakes

55 Black Racer (Coluber constrictor) S

Turtles

- 56 Atlantic Ridley (Lepidochelys kempi) F
- 57 Blanding's Turtle (Emys blandingii) S
- 58 Box Turtle (Terrapene carolina) S
- 59 Leatherback (Dermochelys coriacea) F
- 60 Loggerhead (Caretta caretta) f
- 61 Spotted Turtle (Clemmys guttata) s

Also refer to APPENDIX 1 D

USFWS Nationally Significant Seabird, Wading Bird and Eagle Nesting Islands in Coastal Maine

Section 6; Reporting and Training

Farm staff will be trained in recognizing endangered, threatened and protected species they may see from their farm and a system for recording and reporting such observations to farm management. A Standard Operating Procedure for Predator Interaction is also included in the Fish Health Management Plan available on each site.

6.1 SARA Reporting

Species identified on the Provincial Protected Wildlife factsheets are protected under SARA (Species at Risk Act) and COSEWIC (Committee on the status of Endangered Wildlife in Canada) and have been or could be found in the area of aquaculture sites in Atlantic Canada.

If any of these animals are found in distress around the aquaculture sites, Canadian Coast Guard should be contacted at 1-800-565-1633.

If the animals are observed around the aquaculture sites, care should be exercised to avoid causing them any harm.

6.2 Nuisance Seal Reporting

A Nuisance Seal license may be obtained from the Department of Fisheries and Oceans under the Marine Mammal Regulations. It authorizes producers to harvest those seals that have been observed to be causing damage to aquaculture gear, or fish entrapped in aquaculture gear.

The license holder shall submit a catch report annually which identifies:

- a. The day, month, year on which any seals were taken
- b. The location where any seals were taken
- c. The number of seals recovered
- d. The number of seals struck but not recovered

The catch report shall be mailed to the Department of Fisheries and Oceans (see permit for address).

6.3 General Predator Interactions

Due to the environment in which we operate, wildlife interactions will be unavoidable – both positive or neutral and negative (predator).

Positive or neutral interactions may require management notification if the species is listed on a Species at Risk list or other similar document.

Negative or predator interactions should be noted to determine if there is an increase or decrease in activity. If a predator is persistent or there is the potential for endangerment of employees, deterrence methods may be required. Any interaction, whether intentional or accidental, must be reported.

An EMS Incident Report Form must be completed and submitted to the Area Manager in the event of a negative predator interaction – hard copy or via Pronto Forms on an iPad.

Also refer to APPENDIX 2

EMS Incident Report Form

6.4 Canadian Wildlife Service Permit

Marine birds may become entangled, trapped or oiled from gear or chemicals on an aquaculture site. The first step to preventing such emergencies is prevention. Continually checking nets for integrity and avoiding oil, gas and chemical spills is important.

If a large spill does occur, immediately contact Coast Guard (CG) at 1-800-565-1633 and activate the Spill Prevention and Response Plan (SPRP) or Spill Prevention, Control and Countermeasure (SPCC) Plan. If wildlife is not initially affected, it should be kept out of the spill area, if possible.

Migratory birds are protected under the Migratory Birds Convention Act and some species are also protected under the Species at Risk Act (SARA); this protection can extend to the point where evening handling these species is <u>not allowed without a Canadian Wildlife Service Permit.</u>

Common sense must prevail in all circumstances and caution must be exercised when dealing with birds. In stressful situations, birds may react with more force in an attempt to protect themselves. As well, birds can carry diseases and parasites which may be transmitted to humans. If a bird can be easily released from entrapment without handling, this may be attempted by site workers. Workers should not touch birds, regardless of the situation. If a bird must be handled, clean work gloves must be worn and the bird handled with care. If an incident cannot be resolved, Canadian Wildlife Services should be contacted (506-364-5068) for further direction. A permit may become necessary to handle and transport the bird to a rehabilitation facility.

Any instances of wildlife interaction shall be recorded on the EMS Incident Report Form.

The following three marine birds are protected by SARA and may be found in Atlantic Canada. Site workers should familiarize themselves with these birds. If any of these species are found around the sites in distress, the Canadian Coast Guard should be contacted immediately at 1-800-565-5068. The Coast Guard can help confirm the identity of the bird(s) in question. Workers must describe the scenario (entanglement, chemical spill, etc.) which caused the distress, if known, as well as the location of the species. Proper directions and/or coordinates are essential to help experts arrive in time.

	Harlequin Duck
	During the mating season, males have slate-blue plumage, chestnut sides, and streaks of white, chestnut and black on head. Females are plain, brownish-grey with patches of white around the eye. They usually build their nests on the ground next to banks of
A DECEMBER OF STREET, ST	fast-flowing streams.
A CONTROL OF THE OWNER OWNER OF THE OWNER OF THE OWNER OF THE OWNER OWNER OWNER OF THE OWNER OWNE	Males (left) are black and white with a purplish-black head and a white crescent-shaped patch at the base of the bill. Females (below) are grayish-brown and whitish on the sides and belly with a chocolate brown head. In the winter and spring, females have a bright orange bill.
	of the ground.
	Ivory Gull
S	Adults have black legs and pure white plumage. Bill is slate blue at the base, yellow in the middle with a red tip.
11	Nests are usually built on flat terrain or on sheer cliffs above ice sheets.
	t i se
	Roseate Tern
	These terns would be found locally during breeding season when adults appear mostly white with a black cap, long white tail streamers and a white breast with pale pink. The bill of the Roseate Tern is black with red appearing at the base later in the breeding season.
	Their breeding grounds are found on rocky offshore islands, barrier beaches and salt marsh islands.

Section 7; Control Measures

Any measures taken to protect fish from predators are always carried out in a manner that considers predator welfare and does not endanger the predator population; however, if a predator cannot be deterred and is threatening the security of the containment, it may be dispatched in accordance with Government Policy and Saltwater Management consent.

7.1 Passive Control Measures

The primary containment net will be protected from damage by predators by the use of a predator control net as needed.

The predator net mesh size will be consistent with that utilized in the area for controlling access by predators.

Provision will be made to avoid bird predation with the use of a top bird net.

7.2 Active Control Measures

Non-Lethal, acoustic deterrent devices may be used on sites to discourage birds from landing on the cages. Usage of underwater acoustic devices must be administered under Regulatory approval and following the Acoustic Deterrent Policy.

7.3 Lethal Control Measures

Lethal control measures for predators are prohibited, unless there is a permit in place and actions are carried out according to said permit under the instructions and guidance of Senior Management.

7.4 Daily Inspections

Daily inspections are required on each cage with fish. Any debris should be removed from around or in the cages including garbage, large sticks, and excessive amounts of kelp or rockweed. Waterlines or handrail ties that are missing, broken or chaffed should be replaced. Any lines that are untied must be retied.

For larger repairs, such as broken, chaffed or missing bridals, weight ring ropes or camera lines should be reported to the Site Manager as these types of repairs may require the use of divers, maintenance vessels, or plastic welders.

Any holes discovered in the netting should immediately be repaired, if able, or reported to the Site Manager so that divers can be called in to assess and check for signs of fish escapement.

Also refer to APPENDIX 3

Acoustic Deterrent Policy

9.1 Newfoundland

Interactions between wildlife and aquaculture facilities are bound to occur from time to time. Therefore, our activities should be conducted with respect and care for the local wildlife, ensuring that harmful encounters are minimized.

In cases where you do encounter entangled birds, other wildlife and marine mammals on your site, whether alive or dead, you must contact the following authorities for their information and action;

- Birds and other wildlife: notify the local Conservation Officer, Department of Environment and Conservation (in the Bay D'Espoir area the phone number is 882-2200). If the animal in question is an eagle, you should also contact the Conne River Band Council.
- Marine mammals and fish (tuna, etc.): contact the local Department of Fisheries and Oceans Canada Conservation and Protection Officer in your community.

In the case of wild animals that are alive, the province's Department of Environment and Conservation has a "Wildlife Care and Rehabilitation Program" at Salmonier Nature Park. The local Conservation Officer will be able to determine if the animal in question should be sent to the Salmonier Park.

If a dead animal is encountered, it should be retrieved where possible, treated respectfully, and turned over to the appropriate authority when directed to do so. In the case of bald eagles, the Conservations Officer will make properly permitted arrangements to turn them over to the Conne River Band Council for respectful burial at Conne River.

APPENDICES

Appendix 1 A – New Brunswick SARA List Appendix 1 B – Nova Scotia SARA List Appendix 1 C – Newfoundland SARA List

Appendix 1 D - USFWS Nationally Significant Seabird, Wading Bird and Eagle Nesting Islands in Coastal Maine

Appendix 2 – EMS Incident Report Form

Appendix 3 – Acoustic Deterrent Policy

New Brunswick's Protected Wildlife

The following species are protected under SARA (Species at Risk Act) and COSEWIC (Committee on the status of Endangered Wildlife in Canada) and have been or could be found in the area of southwestern NB's aquaculture sites. If any of these animats are found in distress around the aquaculture sites, Canadian Coast Guard should be contacted at 1-800-565-1633. If the animals are observed around the aquaculture sites, care should be exercised to avoid causing them any harm.



Habitat: Shorefine to continental shelf in Northeast Atlantic Description: Brown to green or grey with spots on dorsal surface, pale underside. Distinctive chin barbell. Atlantic Cod (Gadus morhua) 3 dorsal fins and 2 anal fins. Max. size: 2 m, 96 kg



hard, white bumps) on its head. Broad back, lacks a dorsal fin. Large black baleen whale distinguished by the callosities (thick <u>Habitat:</u> Temperate northern waters in summer Description: North Atlantic Right Whale (Eubalaena glacialis) Season of Concern: Congregate in summer and fall in the ower Bay of Fundy, mainly east of Grand Manan <u>Adult Size:</u> 16-17 m, 63,500 kg



Habitat: Fresh water streams in winter then migrates out to Bay back varies from shades of brown to green and blue. Season of Concern: Spring, summer and fall Description: Sides and belly are silvery, Atlantic Salmon (Saimo salar) Adult size: 60 cm, 3 kg

Atlantic Wolffish (Anarhichas lupus)



Habitat: Inhabits cold, deep water, bottom dwellers, prefer lacking pelvic fins. Body color ranges from slate blue to Description: Rounded profile, heavy head, blunt snout, dull green to purplish brown with vertical, dark brown bars along the sides. Extensive teeth structure rock or hard-clay sediment Max. size: 150 cm, 20 kg



body, dark greybody, white underneath. Narrow, V-shaped head, Description: Baleen whale with a long and slender, streamlined Fin Whale (Balaenoptera physalus) Habitat: Temperate, deep, cool waters pointed snout, paired blowholes. Adult Size: 20-27 m, 70,000 kg "Grey hound of the deep"



Description: Black back, grayish-white sides fading to white Habitat: Close to cooler (<16 °C), coastal areas or river Harbour Porpoise (Phocoena phocoena) estuaries

Max. size: 1.7 m , 65 kg underneath



Porbeagle (*Lamna nasus*) Habitat: Coastal and oceanic

back of dorsal fin, white underside. Head is stout, shout body. Grey-bluish black body with a white patch on the Description: Large shark with a powerful streamlined is pointed. Distinguished by its 3-cusped teeth. Max. size; 3 m in length, 135 kg





Description: Largest living sea turtle. Lacks a bony shell, instead its Habitat: Prefer open ocean, deep water. Nest on ocean beaches. Leatherback Sea Turtle (Dermochelys coriacea) Max.size: 2.4 m in length, 3.6 m wide, up to 725 kg carapace is covered by bluish black skin. Season of Concern; June to October



Females are grayish brown and white on the sides and belly with <u>Description:</u> Medium sized sea duck. Males are black and white. Habitat: Wooded lakes, beaver ponds, overwinter in protected Barrow's Goldeneye (Buscephala islandica) coastal waters or open inland water a chocolate brown head Adult Size: 53 cm, 1 kg









Eskimo curlew (Numenius borealis) *May have gone extinct

Habitat: Pass through Maritimes during migration, no specific Description: Mottled brown shorebird, brown back, buff habitat known

underside, Iong legs, Iong, thin down-curving bill <u>Adult size:</u> 337 cm in length, 270-454 g, 19-23 cm wing span Season of Concern: July - October (fall migration)



head. Females are plain, brownish-grey with patches of white Description: Small sea duck. Males have slate-blue plumage, chestnut sides, and streaks of white, chestnut and black on Adult size: 45cm



Habitat: Nest in freshwater marches and swamps, often with Least Bittern (ixobrynchus exilis) cattails

Description: Member of the heron family. Mainly brown and buff colored body, white underside, black head and back Adult Size: 30 cm in length, 80 g

Season of Concern: Summer (overwinter in southern US states)



markings on plumage, short tail, small bill. Almost Yellow Rail (Cotumicops noveboracensis) Habitat: Found in marshes through summer, Description: Tiny bird with black and white coastal wetlands and rice fields in winter Adult size: 15-19 cm in length, 60 g never flies unless disturbed.



Description: Small sea duck. Males have slate-blue Habitat: Wherever milkweed and wildflowers are chestnut and black on head. Females are plain, plumage, chestnut sides, and streaks of white, found- fields, meadows, gardens, etc. brownish-grey with patches of white Monarch (Danaus plexippus) Adult size: 45cm



Description: Adults have black legs and pure white Habitat: Nests are usually built on flat terrain or on Roseate Tern (Sterna dougalli) sheer cliffs above ice sheets.

Season of Concern: Spring to late August/September plumage. Bill is slate blue at the base, yellow in the middle with a red tip.



Habitat: Nests along coastal sand, gravel beaches, sand flats Description: Small, sand coloredshorebird. Black ring around neck. Bill yellow with a black tip, yellow tegs (In winter, bill is Piping Plover (Charadrius melodus melodus) <u>Adult size:</u> 15-19 cm, 43-48 g <u>Season of Concern:</u> Late April /May to August black, legs are pale)



Juveniles have a dusky face and chin and black spots Season of Concern: Late May/early June (breeding season) Description: Small white seabird with black legs. Habitat: Live near the edges of pack or drift ice on the breast and along the flanks and tail. Ivory Gull (Pagophila eburnea) Adult size: 38-43 cm





Nova Scotia Protected Wildlife

sites, Canadian Coast Guard should be contacted at 1-800-565-1633. If the animals are observed around the aquaculture sites, care should be exercised and have been or could be found in areas of NS where aquaculture is taking place. If any of these animals are found in distress around the aquaculture The following species are protected under SARA (Species at Risk Act) and/or COSEWIC (Committee On the Status of Endangered Wildlife In Canada) to avoid causing them any harm.



Atlantic Whitefish (Coregonus huntsmani) Habitat: Petite Riviere watershed and surrounding waters. Found at sea during spring and summer. Returns to freshwater to spawn during winter. Description: Black, dark green or blue back, sitver sides, white underbely, large scales, Classification: Endengered (COSEWIC & SARA) Max Size: Up to 40 cm



Atlantic Cod (Gadus morhua) Habitat: Shoreline to continental shelf in Northeast Atlantic

Description: Brown to green or grey with spots on dorsal surface, pale underside. Distinctive chin barbs. 3 dorsal fins and 2 anal fins. Classification: Endangered (COSEWIC) Max Size: 2 m, 96 kg



Atlantic Wolffish (Anarhichas lupus) Habitat: Al around Nova Scotia. Deep, rocky continental shelf. Periodically found on sandy or muddy bottom. <u>Description</u>: Rounded profile, heavy head, blumt snout, lacking pelvic fins. Body color ranges from state blue to dull green to purplish brown with vertical, dark brown bars along the sides. Extensive teeth structure. <u>Classification</u>: Threatened (COSEWIC & SARA) <u>Max Size</u>: 150 cm, 20 kg



Attantic Salmon (Saimo salar) Habitat. Throughout the inner Bay of Fundy following anadromous migration. Description: Sides and bely are silvery, back varies from shades of brown to green and blue. Classification: Endangered (COSEWIC & SARA) Max Size: 60 cm, 3 kg



Barrow's Goldeneye (Buscephala Islandica) Habitat: Coastal watens throughout Attantic Canada Description: Medium sized sea duck. High, rounded head is black with white patch under eye. Males are black and white, femaes are greyishh brown and white. Classification: Threatened (COSEWIC & SARA) Max Size: 53 cm, 1 kg



Piping Piover (Charadrius melodus) Habilat: Nest and feed primarity on coastal sand or gravel beaches and sand fats. Found all along the southern shore of Nova Scotta. Description: Gray/brown sldes and back, white under. Black spots around neck, on forehead and at beak tip. Classification; Endangered (COSEWIC & SARA)

Max Size: 19 cm, 48 g



Roseate Tern (Sterna dougalili) Habitat: Occurs in large colonies on coasits and Islands all along the Atlantic shore of Nova Scotia Description: Medium sized seabird with long forked tall. White with black head cap and bill. Classification: Endangered (COSEWIC & SARA) Max Size: 40cm, 130 g



Peregrine Falcon (Falco peregrinus) Habitat: Along the Bay of Fundy coast of Nova Scotia. Nests on cliff ledges near water and large open spaces. Description: Medium sized, grey/blue upper body and wings, white to light brown speckled underparts, black bars on legs.

<u>Classification:</u> Threatened (SARA) <u>Max Size;</u> 59 cm, 910 g









Newfoundland Labrador tee on the status of Endangered Wildlife oundland island. If any of these animals at 1-800-565-1633. If the animals are m.	Fin Whale (Balaenoptera physalus) <u>Habitat:</u> Temperate, deep, cool waters. <u>Description:</u> Baleen whale with a long and slender, streamlined body, dark grey body, white underneath. Narrow, V-shaped head, pointed snout, paired blowholes. <u>Adult Size:</u> 20 - 27 m, 70 MT	Harbour Porpoise (Phocoena phocoena) <u>Habitat:</u> Close to cooler (<16 °C), coastal areas or river estuaries. <u>Description</u> : Black back, grayish-white sides fading to white underneath. <u>Max. size:</u> 1.7 m , 65 kg	(Eubalaena glacialis) (Eubalaena glacialis) <u>Habitat:</u> Temperate northern waters in summer. <u>Description:</u> Large black baleen whale distinguished by the callosities (thick, hard, white bumps) on its head. Broad back, lacks a dorsal fin. <u>Adult Size:</u> 16 - 17 m, 64 MT	Atlantic Wolffish (Anarhichas lupus) <u>Habitat:</u> Inhabits cold, deep water, bottom dwellers, prefer rock or hard-clay sediment. <u>Description:</u> Rounded profile, heavy head, blunt snout, lacking pelvic fins. Body color ranges from slate blue to dull green to purplish brown with vertical, dark brown bars along the sides. Extensive teeth structure. <u>Max. size:</u> 150 cm, 20 kg
Addand ador Newfoundland and Labrador Protected Wildlife re protected under SARA (Species at Risk Act) and COSEWIC (Committ een or could be found near aquaculture sites on the south coast of Newfo ound the aquaculture sites, Canadian Coast Guard should be contacted a quaculture sites, care should be exercised to avoid causing them any harr	erican Eel (<i>Anguilla rostrata</i>) <u>itat:</u> Uses all salinities during life stage, id in all freshwater that are accessible to the tlantic Ocean. <u>cription</u> : Elongated body, grey with white or im color belly, one dorsal/caudal/anal fin. <u> size</u> : Adults - male: 0.4 m, female: 1.0 m	therback Sea Turtle (<i>Dermochelys coriacea</i>) <u>itat:</u> Prefer open ocean, deep water. Nest on an beaches. <u>cription:</u> Largest living sea turtle. Lacks a bony I, its carapace is covered by bluish black skin. <u>isize:</u> 2.4 m in length, 3.6 m wide, 725 kg son of Concern: June to October	intic Cod – Laurentain North dus morhua) <u>itat:</u> Northern Gulf of St. Lawrence and ars off the south coast of Newfoundland. ate inshore to their feeding grounds. <u>cription:</u> Brown to green or grey with spots lorsal surface, pale underside. inctive chin barbell, 3 dorsal and 2 anal fins.	 size: 2 m, 96 kg e Whale (Balaenoptera musculus) e Whale (Balaenoptera musculus) itat: Along the north shore of the Gulf of awrence; off eastern Nova Scotia; off the h coast of the island of Newfoundland. and nore the island of Newfoundland. cription: Largest animal on earth, colored is and light grey, smallish dorsal fin and ted pectoral flippers. size: 30 m, 181 MT
Newfou Labr The following species i in Canada) and have b are found in distress ar observed around the ad	An to A for the A main of the	Sea she coce	Ati Ga Mig Mig Oes on c	May in the second secon



OUACULTURE



reaching 12 cm in diameter

Nationally Significant Seabird, Wading Bird and Eagle Nesting Islands in Coastal Maine



For many years, seabird biologists from U.S. Fish and Wildlife Service and Maine Dept. of Inland Fisheries and Wildlife have conducted surveys to identity coastal islands that support nesting pairs of seabirds, wading birds, and bald eagles. The table below is based on information last updated in 2002.

KEY TO THE TABLE on the following 8 pages):

CIR#		Coastal Island Registry Number (every island has a unique CIR#)
OWNE	R	(May indicate fee and/or easement ownership)
- 1	IFW -	Maine Dept. of Inland Fisheries and Wildlife
]	FWS-	U.S. Fish and Wildlife Service, Maine Coastal Nesting Islands NWR
	ANP -	Acadia National Park
1	BPL	Maine Bureau of Parks and Lands
I	MDOI	Maine Dept. of Transportation
I	NGO	Non-government conservation organization
l	PRI	towns and private owners
((E)	Privately owned, protected with conservation easement
1	*	nesting site usually for bald eagles on a relatively large island with multiple owners
VALUE	S	
	S	Island where 1% or more of the state's seabird population nests
	w =	Island where 1% or more of the state's wading bird population nests
- 1	R	Island where any number of federally endangered roseate terms nests

- E Island where bald eagles nest
- **D** Island that may not meet the 1% population criteria for any one species, but support three or more species of nesting seabirds

MCINWR

Island identified in the Comprehensive Conservation Management Plan for potential acquisition by Maine Coastal Islands National Wildlife Refuge — if current owners are willing sellers and federal funds are available for acquisition.



This list of nationally significant islands is intended to provide a helpful reference to inform recreational users and to catalyze protection of high value nesting islands through effective stewardship, management agreements, easements and/or fee acquisition with willing landowners. This list alone should not be used for making final management decisions or for regulatory purposes. Rather, the list should be considered as a helpful first reference, to be checked for updates and accuracy on an as-needed, island-specific basis.

In order to minimize disturbance and maximize nesting success, please respect island closures for recreational uses during the nesting season (April 1 - August 31).

CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
55-012	FREYEE ISLAND (EAST)	IFW	Brooklin	9.6	E	
55-088	UPPER COOMBS ISLAND	PRI	Brunswick	8.6	IE I	v
55-105	DOUGHTY ISLAND	NGO	Harpswell	1.4	E	
55-156	DUCK ROCK	IFW	Harpswell	1.0	D	
55-159	JENNY ISLAND	IFW	Harpswell	3.5	S, R, D	
55-175	LONG LEDGE	IFW	Harpswell	1.3	D	
<u>55-176</u>	LONG LEDGE (SOUTH)	IFW	Harpswell	2.0	S, D	
55-177	FLAG ISLAND ISLAND	IFW	Harpswell	26.2	S, D	
55-178	TWO BUSH ISLAND	IFW	Harpswell	2.0	D	
55-179	CEDAR LEDGE	IFW	Harpswell	2.4	D	
55-200	LANES ISLAND	PRI	Yarmouth	28.2	E	v
55-223	THE NUBBIN	IFW	Yarmouth	0.2	R	
55-245	SOW AND PIGS	PRI	Freeport	2.9	Е	
55-275	UPPER GREEN (SOUTH)	IFW	Cumberland	1.2	S, D	
55-282	LITTLE WHALEBOAT ISLAND	PRI	Harpswell	18.0	W	v
55-283	LITTLE WHALEBOAT ISLAND (SE)	PRI	Harpswell	4.3	D	v
55-295	WILLIAMS ISLAND	PRI, PRI/NGO	Freeport	21.4	E	
55-297	UPPER GREEN ISLAND (N)	IFW	Cumberland	0.6	D	
55-330	SCREECHING GULL	IFW	Falmouth	0.1	R	
55-381	HOUSE ISLAND	PRI	Portland	31:1	D	~
55-383	RAM ISLAND	IFW	Portland	14.1	S, W, D)
55-386	OUTER GREEN ISLAND	IFW	Portland	5.4	S, D	
55-406	LITTLE BIRCH ISLAND	IFW	Harpswell	9.2	S, D	
55-415	UPPER FLAG ISLAND	FWS	Harpswell	34.1	D	
55-427	TURNIP ISLAND	PRI	Harpswell	1.9	D	v
55-437	LITTLE MARK ISLAND	IFW	Harpswell	1.7	S, D	
55-439	EAGLE ISLAND	BPR	Harpswell	13.3	D	
55-458	WEST BROWN COW ISLAND	IFW	Cumberland	1.3	D	
55-499	INNER GREEN ISLAND	IFW	Portland	3.0	D	
55-521	RAM ISLAND	PRI	Cape Elizabeth	2.8	S, D	~
55-605	RAM ISLAND	FWS	Harpswell	6.3	D	
55-615	POND ISLAND	IFW	Harpswell	22.7	S, R, D	
55-626	RAGGED ISLAND	PRI	Harpswell	74.9	S, D	~
55-628	WHITE BULL ISLAND	IFW	Harpswell	5.5	D	
55-630	MARK ISLAND	IFW	Harpswell	10.5	W, D	
55-632	EAST BROWN COW	IFW	Harpswell	2.4	D	
59-010	HOG ISLAND	PRI/ANP	Gouldsboro	52.3	<u> </u>	
59-012	JORDAN ISLAND	PRI/ANP	Winter Harbor	261.5	Е	
59-036	BALD ROCK	PRI	Steuben	1.3	D	×
59-037	SALLY ISLAND	PRI	Gouldsboro	5.3	D	✓
59-039	SHEEP ISLAND	PRI	Gouldsboro	9.4	E	v
59-060	ROLLING ISLAND	ANP	Winter Harbor	5.1	E	
59-062	SCHOODIC ISLAND	ANP	Winter Harbor	67.2	S.D.E	
59-065	TURTLE ISLAND	TNC	Winter Harbor	128.7	W, E	
59-084	BURYING IŞLAND	PRI/IFW	Franklin	37.8	W, E	
59-087	HILLS COVE ISLAND	PRI/NGO	Hancock	9.9	E	
59-089	KILKENNY COVE ISLAND	PRI	Hancock	3.1	Е	
<u>59-110</u>	BUCKSKIN ISLAND	PRI	Franklin	5.6	E	~
59-119	MT DESERT ISLAND*	PRI	Bar Harbor	69,049.0	E	
<u>59-1</u> 27	INDIAN PT LEDGE	IFW	Bar Harbor	0.4	S	

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
59-132	BLACK ISLAND	NGO	Bar Harbor	13.8	E	~
59-136	JED ISLAND	PRI	Bar Harbor	11.8	E	
59-137	CONARY NUB	PRI	Blue Hill	0.2	S	~
59-160	THE TWINNIES (NORTH)	PRI	Bar Harbor	3.6	Е	¥
59-161	THE TWINNIES (SOUTH)	FWS	Bar Harbor	3.3	E	
59-170	TREASURE ISLAND	PRI	Sorrento	18.7	E	
59-177	CALF ISLAND	PRI	Sorrento	98.2	E	
59-180	STAVE ISLAND	PRI	Gouldsboro	499.4	E	
59-182	IRONBOUND ISLAND	PRI/ANP	Winter Harbor	830.8	Е	TDS D
59-183	PREBLE ISLAND	NGO	Sorrento	78.8	E	10.00
59-189	INGALLS ISLAND	PRI/ANP	Sorrento	23.5	Е	
59-190	BEAN ISLAND	PRI/ANP	Sorrento	30.1	W.E	~
59-195	SHEEP PORCUPINE ISLAND	NPS	Gouldsboro	22.2	E	III IN DO
59-197	BALD PORCUPINE ISLAND	NPS	Gouldsboro	31.9	E	1 2 2
59-198	BURNT PORCUPINE ISLAND	PRI	Gouldsboro	37.6	E	
59-201	LONG PORCUPINE ISLAND	NGO	Gouldsboro	130.1	E	
59-236	HARDWOOD ISLAND	PRI/ANP	Tremont	196.1	E	
59-240	BARTLETT ISLAND*	PRI/TOWN	Mount Desert	2.158.6	E	20.000
59-242	TINKER ISLAND	NGO,PRI/NGO	Tremont	446.9	E	1000000000
59-265	BAR ISLAND	NPS	Mount Desert	6.7	E	
59-270	GREAT CRANBERRY ISLAND*	PRI	Cranberry Isles	1.064.9	E	
59-300	THE THRUMCAP	IFW	Bar Harbor	2.6	S. D	
59-301	EGG ROCK	FWS	Winter Harbor	12.5	R, D	-
59-313	LT CRANBERRY ISLAND	PRI	Cranberry Isles	491.3	E	
59-340	TRUMPET ISLAND	FWS	Tremont	6.4	D	
59-341	SHIP ISLAND	FWS	Tremont	13.1	S	
59-343	WEST BARGE ISLAND	FWS	Tremont	0.5	D	-
59-347	POND ISLAND	PRI	Frenchboro	241.0	Е	4
59-351	JOHNS ISLAND	PRI	Swans Island	21.8	E	¥
50-308	GOOSEBERRY ISLAND	PRI	Swans Island	5.4	D	4
50_400	BAKER ISLAND (N)	NGO	Swans Island	8.1	F	
59-403	SWANS ISLAND*	PRI	Swans Island	6 853 3	E	-
59-438	PLACENTIA ISLAND	NGO	Frenchhoro	553.0	F	
59-439		NGO	Frenchboro	89.8	SDE	
59-440	GREAT DUCK ISLAND	PRI/NGO's/IFW	Frenchboro	212.0	S D F	
59-443		PRI(NGO)	Frenchboro	2.9	F	
59-445	GREEN LIEDGE	IFW	Frenchboro	1.9	0	-
59-446	GREEN ISLAND	IFW	Frenchboro	5.6	S D	
59-447	SISTER ISLAND	PRI	Swans Island	30.3	E	~
50 449		DDI	Erenchhoro	10.6	E	~
50 440			Frenchboro	0.6	<u> </u>	
59-449			Frenchboro	10.0	3	
59-450			Frenchboro	19.9	E	
59-451		FRI, FRI/NGU		1,408.5	E F	
59-470	RINGTOWN(LT MARSHALL) ISLAND		Swans Island	13.9	E	
09-4/9		IP VV	Swans Island	1.2	0.0	
59-480		IEW	Swans Island	01.0	3, U	
50 400			Swans Island	4.5	5, D	
59-403			Swans Island	43.1	5, U E	
09-0/U			Pombroko	3,811.1	E	
28-201	TOUNGS ISLAND (IMID) (SAMS?)		rembroke	2.9		

Nationally Significant Nesting Islands inCoastal Maine, U.S. Fish and Wildlife Service, 2002
CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
59-596	NN I S BEAR HEAD(RAM?)	PRI	Brooksville	0.4	E	1
59-650	HOLBROOK ISLAND	BPL	Castine	110.9	E	
59-651	RAM ISLAND	NGO	Castine	7.3	E	
59-669	THRUMCAP ISLAND	IFW	Brooksville	1.2	D	
59-672	BUCK ISLAND	IFW	Brooksville	0.9	D	
59-673	SPECTACLE ISLAND	PRI	Brooksville	8.7	S, D	~
59-674	GREEN LEDGE	IFW	Deer Isle	0.8	D	
59-675	WESTERN ISLAND	PRI/NGO	Deer Isle	22.0	S, E	~
59-685	COLT HEAD	IFW	Deer Isle	4.3	D	
59-687	BEACH ISLAND	PRI	Deer Isle	73.4	E	
59-709	SCOTT I (W)	PRI/NGO	Deer Isle	6.2	E	
59-742	NN I S CARLETON I(SALT POND I	S.?) IFW	Blue Hill	0.2	E	
59-771	BRADBURY ISLAND	NGO	Deer Isle	160.7	E	
59-772	LITTLE SPRUCEHEAD	PRI	Deer Isle	44.1	S	¥
59-782	HARDHEAD ISLAND	IFW	Deer Isle	5.2	S, D	
59-789	GRASS LEDGE (W)	IFW	Deer Isle	1.1	S, D	
59-790	COMPASS ISLAND	PRI	Deer Isle	7.0	D	~
59-799	INNER PORCUPINE ISLAND	PRI	Deer Isle	10.2	E	~
59-800	OUTER PORCUPINE ISLAND	PRI	Deer Isle	6.3	E	v
59-802	GRASS LEDGE	IFW	Deer Isle	1.3	D	
59-810	CROW ISLAND	IFW	Deer Isle	5.3	E	
59-825	BARRED ISLAND	NGO	Deer Isle	3.4	Е	······································
59-836	SCRAGGY ISLAND	PRI/NGO	Stonington	8.5	W	~
59-849	CURRENT ISLAND	PRI?	Deer Isle	2.3	E	
59-923	CAMPBELL ISLAND	NGO	Deer Isle	92.0	E	-
59-925	BEAR ISLAND	PRI	Deer Isle	20.1	E	¥
59-931	SMUTTYNOSE ISLAND	IFW	Brooklin	0.7	 R	
59-933		PRI	Brooklin	7.0	S D	~
50-056	EASTERN MARK ISLAND	PRI/ANP	Stonington	9.9	, F	~
50.050			Stonington	0.0		¥
50 066	BAM ISLAND	EDI/ADE RDI	Stonington	2.2	<u>E</u>	
50 077		BDI	Stonington	<u> </u>		
50 000			Swone leland	1.6	<u> </u>	¥
59-900			Swans Island	1.0	<u> </u>	
50,006			Deer Isla	3.6	<u> </u>	
50-008			Swans Island	17	<u> </u>	
61 002		DRI2	Gardiner	23	F	
63-011	SPOON LEDGE		North Haven	0.8	<u> </u>	
63-013	BURNT ISLAND	IFW	North Haven	17.2	<u> </u>	
63-018	SHEEP Island	IFW	North Haven	22.5	E	
63-034	STIMPSONS ISLAND	PRI/NGO	North Haven	194.0	E	
63-079	BLUFF HEAD	PRI/NGO	Vinalhaven	7.8	E	
63-081	NECK ISLAND	PRI/NGO	Vinalhaven	21.7	E	
63-093	PENOBSCOT ISLAND	PRI/NGO	Vinalhaven	257.0	E	i <u>i i i i i i i i i i i i i i i i </u>
63-135	GREEN LEDGE	PRI	Vinalhaven	0.7	D	4
63-157	GREENS ISLAND	PRI	Vinalhaven	432.5	E	,
63-160	VINALHAVEN*	PRI	Vinalhaven 1	1.397.8	E	
63-166	CARVERS ISLAND	BPL (IFW)	Vinalhaven	8.4	S, D	
63-169	HAY ISLAND	NGO	Vinalhaven	3.6	D	
63-174	ROBERTS ISLAND	FWS	Vinalhaven	10.8	S, D	

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
63-175	ROBERTS ISLAND (WEST)	FWS	Vinalhaven	2.4	S, D	
63-176	BRIMSTONE ISLAND	NGO	Vinalhaven	32.3	S, D	
63-179	LITTLE BRIMSTON	NGO	Vinalhaven	3.3	D	
63-183	OTTER ISLAND	IFW/NGO	Vinalhaven	44.4	S, D	
63-200	SPARROW ISLAND	IFW	Isle au Haut	5.3	S, D	
63-204	HARDWOOD ISLAND	IFW	Isle au Haut	13.6	E	
63-211	RAM ISLAND	IFW	Isle au Haut	3.4	E	
63-230	ISLE AU HAUT*	PRI/ANP	Isle au Haut	6,808.7	E	
63-260	SOUTHERN MARK ISLAND	IFW	Isle au Haut	5.3	S, D	
63-264	FOG ISLAND	PRI/NGO	Isle au Haut	56.7	Е	v
63-266	GREEN LEDGE	IFW	Isle au Haut	4.2	S, D	
63-283	COW PEN (WEST)	IFW	Isle au Haut	3.8	S	11106
63-284	COW PEN (EAST)	IFW	Isle au Haut	2.6	S	
63-287	GREAT SPOON ISLAND	IFW/ANP	Isle au Haut	50.4	S, D	
63-289	LITTLE SPOON ISLAND	NGO/ANP	Isle au Haut	23.1	S, D -	
63-313	CURTIS ISLAND	PRI?	Camden	7.8	E	
63-314	GOOSE ROCK	IFW	Rockport	0.5	D	
63-323	RAM ISLAND	PRI	Rockport	1.1	S, D	Y
63-330	MOUSE ISLAND	PRI	North Haven	2.7	D	¥
63-335	EAST GOOSE ROCK	IFW	North Haven	0.7	D	10 1 10
63-336	GOOSE ISLAND	IFW	North Haven	1.6	D	
63-339	MARK ISLAND	NGO	North Haven	31.1	Е	
63-341	ROBINSON ROCK	IFW	North Haven	1.9	D	
63-393	SHEEP ISLAND	PRI	Owls Head	62.3	Е	
63-402	FISHERMAN ISLAND	IFW	Matinicus Isle P	1. 8.9	D	
63-403	MARBLEHEAD ISLAND	IFW	Matinicus Isle P	l. 1.0	D	12.0
63-418	LT GREEN ISLAND	PRI	Matinicus Isle P	1. 2.9	S, D	4
63-420	GARDEN ISLAND	IFW	Thomaston	1.5	D	1. 1. 1.
63-421	OAK ISLAND	PRI	Matinicus Isle P	l. 1.8	D	~
63-485	GREEN ISLAND	IFW	Vinalhaven	1.7	D	±1
63-493	GREEN LEDGES	IFW	Vinalhaven	2.3	S, D	
63-501	CRANE ISLAND (NORTH)	PRI	Vinalhaven	35.9	Е	
63-503	SPECTACLE ISLAND (WHITE IS.?)	PRI	Vinalhaven	3.7	E	
63-505	CRANE ISLAND (SOUTH)	PRI	Vinalhaven	1.6	E	×
63-526	HURRICANE ISLAND LEDGE	IFW	Vinalhaven	1.4	D	and the second
63-578	GUNNING ROCK (EAST)	IFW	Saint George	2.7	D	
63-579	THE BROTHERS (NORTH)	NGO	Saint George	3.8	D	4
63-580	THE BROTHERS (C)	NGO	Saint George	0.6	R.D	¥
63-581	THE BROTHERS (SOUTH)	NGO	Saint George	7.4	D	¥
63-582	HAYLEDGE	NGO	Saint George	5.0	D	
63-584	METINIC ISLAND	FWS/PRI	Matinicus Isle P	1. 346.0	S. R. D	
63-585	METINIC GREEN ISLAND	PRI	Matinicus Isle P	1. 8.7	S. D	191121
63-588	HOG ISLAND	PRI	Matinicus Isle P	1. 9.4	D	
63-626	HURRICANE ISLAND	PRI	Matinicus Isle P	1.1.8	D	¥
63-634	GRAFFAM ISLAND	PRI	Muscle Ridge S	65.1	W	~
63_651			Matinique Ielo D	. <u>00.1</u> I 11.0	F	~
63 652		EVVIS	Matinious Isle P			
62 654			Moticious Isle P	1. 0.1	0	~
03-054				1. 30.0	5,0	
03-055	LAKGE GREEN ISLAND	PRI	Matinicus Isle P	1. 85.3	S, R, D	
63-701	HARBOR ISLAND	NGO/PRI	Friendship	96.7	S	v 5

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

<u>CIR #</u>	Island name	OWNER	TOWN	Acres	Values	MCINWR
63-705	CRANE ISLAND	PRI/FWS	Friendship	11.9	S, D	
63-707	FRANKLIN ISLAND	FWS	Friendship	10.9	S, W, D	
63-730	SAND ISLAND	PRI	Friendship	4.2	Е	~
63-731	RAM ISLAND	PRI	Friendship	1.3	E	¥
63-802	BAR ISLAND	PRI	Saint George	8.1	S, D	~
63-820	SHAG LEDGES (EAST)	IFW	Saint George	1.7	D	
63-821	SHAG LEDGDES (WEST)	IFW	Saint George	1.4	D	
63-833	HART ISLAND	FWS	Saint George	13.2	S, D	
63-836	GUNNING RK (WEST)	IFW	Saint George	2.1	S, D	
63-839	OLD HUMP LEDGES (SOUTH)	IFW	Saint George	1.7	D	
63-860	EASTERN EGG ROCK	IFW	Saint George	9.6	<u>S, R, D</u>	
<u>63-873</u>	LITTLE EGG ROCK	IFW	Saint George	3.2	D	
<u>63-875</u>	SHARK ISLAND	IFW	Saint George	2.5	<u>S. D</u>	
<u>63-900</u>	NO MAN'S LAND	IFW	Matinicus Isle Pl.	23.5	S, D	
<u>63-901</u>	TWO BUSH ISLAND	PRI	Matinicus Isle Pl.	5.9	S, D	¥
63-917	WOODEN BALL ISLAND	PRI	Matinicus Isle Pl	38.2	S,D	¥
63-920	TENPOUND ISLAND	NGO	Matinicus Isle Pl.	28.3	S, D	
63-923	SEAL ISLAND	FWS	Vinalhaven	95.8	S, R, D	
63-924	PUDDING ISLANDI	IFW	Matinicus Isle Pl.	2.9	S, D	<u>, , , , , , , , , , , , , , , , , </u>
63-929	GREEN LEDGE	IFW	Matinicus Isle Pl.	4.4	D	
63-930	RAGGED ISLAND	PRI	Matinicus Isle PI.	332,3	D	
63-940	MATINICUS ROCK	FWS	Matinicus Isle Pl.	25.7	<u>S, R, D</u>	
65-019	HOG ISLAND	PRI	Damariscotta	4.7	E	~
65-123	HODGSONS ISLAND	NGO	South Bristol	23.2	E	
65-165	HOG ISLAND	NGO	Bremen	302.2	E	
65-173	CROTCH ISLAND (SOUTH)	IFW	Bremen	0.7	E	
65-189	KILLICK STONE	IFW	Bristol	5.5	R, D	
65-194	WRECK ISLAND	IFW	Bristol	14.1	<u> </u>	E
65-198	ROSS ISLAND	NGO	Bristol	26.7	S, D	
<u>65-200</u>	HADDOCK ISLAND	PRI	Bristol	12.1	D	×
65-201	WESTERN EGG ROCK	NGO	Bristol	7.9	<u>S, D</u>	
65-244	CHRISTMAS COVE	IFW	South Bristol	0.3	R, D	
<u>65-258</u>	THREAD OF LIFE	PRI	South Bristol	1.4	S, D	<u> </u>
<u>65-267</u>	THRUMCAP ISLAND (SOUTH)	FWS	South Bristol	9.0	R	
65-274	FISHERMAN ISLAND	PRI	Boothbay	70.7	W, D	v
65-276	WHITE ISLAND (INNER)	NGO/FWS	Boothbay	10.6	S, D	
65-278	WHITE ISLAND (OUTER)	FWS	Boothbay	13.4	W, D	
65-279	OUTER HERON ISLAND	FWS	Boothbay	66.2	W, E	
65-280	DAMARISCOVE ISLAND	NGO	Boothbay	242.3	S, D	~
65-287	PUMPKIN ISLAND	State of Maine	Boothbay	5.7	D	
65-313	EASTERN DUCK ROCK	IFW	Monhegan Island	2.2	D	
65-408	ISLE OF SPRINGS	PRI	Boothbay Harbor	104.9	E	
65-423	GREEN ISLAND	PRI	Southport	19.6	E	
<u>65-461</u>	LOWER MARK ISLAND	NGO/FWS	Southport	9.5	S, W	
73-010	SWAN ISLAND	IFW	Perkins Twp	1,434.7	E	
73-012	LT SWAN ISLAND	IFW	Perkins Twp	46.3	E	
73-030	FREYEE ISLAND (WEST)	PRI	Topsham	5.3	E	V
73-065	NN I (STONEY ?)	PRI?	Bath	1.5	Е	
73-067	THORNE ISLAND	PRI	Woolwich	11.5	Е	
73-072	CRAWFORD ISLAND	PRI	Bath	7.6	E	F

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
73-090	LITTLE LINES ISLAND	PRI?	Woolwich	0.9	Е	
73-168	LEE ISLAND	IFW	Phippsburg	105.6	Ε	
73-213	NORTH SUGARLOAF	IFW	Phippsburg	0.8	R	
73-262	OUTER HEAD	BPL	Georgetown	3.4	R	
73-280	SOUTH SUGARLOAF	IFW	Phippsburg	1.3	S, R, D	- Okla
73-282	POND ISLAND	FWS	Phippsburg	10.5	S	
73-308	FULLER ROCK	PRI	Phippsburg	2.4	D	4
73-313	HERON ISLAND (NORTH)	NGO	Phippsburg	2.0	S, D	1
73-315	HERON ISLAND (C)	NGO	Phippsburg	2.7	D	
73-316	HERON ISLAND (SOUTH)	NGO	Phippsburg	3.3	S, D	
73-320	SEGUIN ISLAND	NGO	Georgetown	63.1	S. D	v
77-011	SEARS ISLAND	MDOT	Searsport	977.1	E	
77-012	ISLESBORO*	PRI	Islesboro	7.750.6	Ē	
77-045	RAM ISLAND	A PRI	Islesboro	70	F	v
77-047		IFW	Islesboro	11.5	S D	
79-012	ST CROIX ISLAND	ANP	Calais	7.4	<u> </u>	
79-061	FALLS ISLAND	NGO PRI/NGO	Trescott Two	143.1	F	
79-072	WILBUR NECK (SOUTH)	IFW	Pembroke	6.1	F	THE STREET
79-081	WILBUR NECK (NORHT)	PRI	Pembroke	69.4	F	
79-085	NN I REYNOLDS POINT	IFW	Edmunds Twp	0.3	F	
79-126	GOOSE ISLAND	IFW	Fastnort	3.7	<u>S</u> D	
79-128	MATTHEWS ISLAND	PRI2	Eastnort	18.1	F	
70-120		DRI	Eastport	18	SD	~
70 172		EW/S	Edmunds Two		<u> </u>	
70-103	EREDS ISLAND	DRI	Trescott Two	3.4	<u> </u>	
79-195		 DRI	Lubec	4.5	F	
79-219	TALBOT COVE ISLAND (MEST)		Trescott Two	4.5	<u> </u>	
79-228	CARLOS COVE ISLAND		Trescott Two	3.8	F	
70-241		NGO	Lubec	12.6	F	
79-279	HOG ISLAND	IFW	Machiasport	30.7	DE	
70-285			Machiasport	73.0	E	100
79-290	YELLOW HEAD ISLAND	PRI2	Machias	15.8	F	
79-291	BAR ISLAND	22	Machiasport	49.7	E	
70-207		PRI	Cutler	21.1	E	~
70-304		US Coast Guard	Cutler	16.0	E	
70 212		EW/S	Cutler	53	S D	
79-345		FWS	Cutler	11.2	<u>5, D</u>	
70-347	CROSS ISLAND	F\A/S	Cutler	1 474 8	E	
70-351		FW/S	Cutler	80	E	
79-352		FW/S	Cutler	14.5	SD	
79-356	STONE ISLAND	NGO	Machiasport	57.7	W F	
79-350			Machiasport	95.6	<u> </u>	
79-360		F\A/S	Machiasport	30.0	<u> </u>	
79-370		PRI	Fastport	73.2	E	
70-271	POPES FOLLY	IEW/	Lubec	17	F	
70 202			Roque Bluffe	1.1	E	
19-393			Addisor	0.0		
79-410		PKI	Addison	20.2	E	
/9-412	DUCK LEDGE ISLAND	PRI	Addison	1.1		-
79-422	INNER GOOSE ISLAND	IFW	Addison	2.9	E	
79-462	LI RAMISLAND	PRI	Roque Bluffs	2.0	E	7

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

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79-464	FELLOWS ISLAND	PRI	Roque Bluffs	33.0	E	v
79-475	ROQUE ISLAND	PRI	Jonesport	1,306.7	E	
79-481	LT SPRUCE ISLAND	PRI	Jonesport	84.3	E	
79-488	BALLAST	IFW	Jonesport	3.5	S, D	
79-493	MARK ISLAND	NGO	Jonesport	39.2	E	
79-499	NIPPLE ISLAND	NGO	Jonesport	0.3	D	
79-512	GREAT WASS ISLAND*	PRI/NGO	Beals	2,653.5	E	
79-514	SHEEP ISLAND	PRI	Jonesport	4.2	E	~
79-520	PIG ISLAND	PRI	Beals	54,1	E	
79-523	FRENCH HOUSE ISLAND	PRI	Beals	8.1	E	
79-570	HALIFAX ISLAND	FWS	Jonesport	60.0	D	
79-572	GREEN ISLAND	IFW	Jonesport	2.0	D	
79-573	EAST BROTHERS	FWS	Jonesport	16.8	S, D	
79-574	ANGUILLA ISLAND	PRI	Jonesport	12.9	E	
79-576	PULPIT ROCK	IFW	Jonesport	1.7	S, D	
79-580	DOUBLE SHOT ISLAND	PRI	Jonesport	7.5	Е	
79-586	WEST BROTHERS	IFW	Jonesport	12.9	D	
79-600	LITTLE RAM ISLAND	IFW	Beals	13.1	E	
79-601	BIG RAM ISLAND	PRI	Beals	29.3	E	¥
79-602	OUTER RAM ISLAND	PRI	Beals	8.6	Е	v
79-605	EGG ROCK	IFW	Beals	1.9	D	
79-610	TOMS ISLAND (NORHT)	PRI	Addison	1.6	Е	
79-614	INNER SAND ISLAND	FWS	Addison	17.8	D	
79-619	PLUMMER ISLAND (EAST)	NGO	Addison	8.0	E	
79-621	FLAT ISLAND	PRI	Addison	19.6	S. D	v
79-623	RAM ISLAND	PRI?	Addison	5.7	E	
79-626	BIG NASH ISLAND/CONE	PRI	Addison	75.3	S. R. D	¥
79-627	NASH ISLAND	PRI/FWS	Addison	16.7	S D	~
70,632		PRI	Addison	23	D	~
70 625			Addison	12.0	<u></u>	
70-638			Addison	10.0	<u> </u>	
79-662		NGO	lonesport	5.2		
79-676		IFW	Jonesport	1.5	<u> </u>	
79-679	MINKISLAND	PRI	Beals	2.6	<u> </u>	
79-693	BROWNEY ISLAND	NGO	Beals	39.8	<u>SDF</u>	
79-694	FISHERMAN ISLAND	PRI	Beals	48.1	<u> </u>	~
70-7/0		NGO	Addison	27.5	<u> </u>	
79-742		PRI	Addison	23.9	 F	<u> </u>
79-748	NIGHTCAP ISLAND	PRI/IFW	Addison	20.0	<u> </u>	
79-751	FAGLE ISLAND	PRI/NGO	Addison	3.5	<u> </u>	
79-757	BOWLINE HEAD	NGO	Harrington	7.2	F	
79-763	STROLIT ISLAND	PRI	Harrington	20.8	F	~
70-765		BPI	Hartington	1.0	E	
79-778		PRI	Harrington	n a	E	
70.797		PPI	Milbridge	70 6	Ē	~
70 700		DDI	Harrington	200 5	E	
70 920	RAR ISLAND		Milbridge	JZZ.U 27.0	F	
70-920		FINIS /DDI	Milbridge	1 050 2	<u> </u>	
70_922		PRI2	Steuben	2 9	E	
70 925		DDI	Steuben	7.0		~
19-000	OTELF IOLAND	E IVI	Steubell	1.9		8

Nationally Significant Nesting Islands in Coastal Maine, U.S. Fish and Wildlife Service, 2002

CIR #	Island name	OWNER	TOWN	Acres	Values	MCINWR
79-836	SALLY ISLAND	FWS	Steuben	1.3	5 E	
79-843	EASTERN ISLAND	PRI	Steuben	4.7	S, D	v
79-903	FLINT ISLAND	NGO	Harrington	136.0	E	
79-906	SHIPSTERN ISLAND	NGO	Harrington	8.0	E	
79-909	TRAFTON ISLAND	PRI/IFW	Harrington	113.2	W	v
79-917	DOUGLAS ISLAND (WEST)	PRI	Milbridge	10.5	- E	23
79-918	DOUGLAS ISLAND (MID)	PRI	Milbridge	19.4	E	
79-919	DOUGLAS ISLAND (EAST)	PRI	Milbridae	3.9	E	
79-922	JORDANS DELIGHT	FWS/PRI	Harrington	27.0	S, D	
79-929	GREEN ISLAND	IFW	Steuben	14.2	🖉 S, D	
79-933	PETIT MANAN	FWS	Steuben	15.7	S, R, D	
79-935	EGG ROCK	IFW	Milbridge	1.8	D	
81-001	BLUFF ISLAND	NGO	Saco	14.5	S, D	
81-002	STRATTON ISLAND	NGO	Saco	30.0 -	S, W, R,	D
81-010	EAGLE ISLAND	PRI	Saco	3.1	S, D	y
81-015	WOOD ISLAND	NGO/US Coast Guard	Biddeford	43.5	S, D	
81-016	STAGE ISLAND	NGO	Biddeford	10.1	D	
81-018	BEACH ISLAND	IFW	Biddeford	3.1	R	
81-025	GOOSEBERRY ISLAND	IFW	Biddeford	1.7	D	
81-040	W GOOSE ROCKS	IFW	Kennebunkport	2.1	R	
81-041	W GOOSE ROCKS	IFW	Kennebunkport	0.4	R	
81-098	GREEN ISLAND	NGO	Kennebunkport	5.8	S, D	
81-101	FOLLY ISLAND	PRI	Kennebunkport	5.4	S, D	¥
81-102	BUMPKIN ISLAND	NGO	Kennebunkport	1.7	S, D	
81-181	DUCK ISLAND	FWS	Kittery	8.8	S, D	1 A
81-182	SMUTTYNOSE ISLAND	PRI/FWS	Kittery	40.5	S, D	
81-191	APPLEDORE ISLAND	PRI	Kittery	99.1	S, W, D	¥

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Environmental Management System Manual for Cooke Aquaculture Inc.

Facilities in New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island & Maine USA

Record	EMS	Incident Report	
Created by:	Revision:	Replaces Revision :	Reason for Revision:
Jennifer Wiper	November 2014	New	New

All incidents that affect our Environmental Management System (EMS) need to be documented in detail to determine if changes are needed to our Operational Controls (procedures, equipment, reporting or staff training).

Blood Water Spill
Chemical / Fuel Spill
Vessel / Barge Sinking

INCIDENT TYPE

 Potential Fish Escape
Wildlife Interaction
Other:

TO BE COMPLETED BY INCIDENT RECORDER

Name of Incident Recorder:	Date of Incident:	
Location of Incident:		
Personnel Involved:		
Description of Incident:		
Immediate Corrective Action:		
Preventative Action:		
Management Representative Contacted:	Position:	

TO BE COMPLETED BY MANAGEMENT REPRESENTATIVE

Management Representative Remarks:		
Revisions Required to Operational Controls:		
Signature of Management Representative:	Date Signed:	
The Referred Individual must submit this record to the Cooke Aquaculture Certification Supervisor upon completion		

FOR OFFICE USE ONLY

Reviewed and Documented (CAI CS signature)	



Acoustic Deterrent Policy

Version 15.05-01

From the careful selection of farm sites and investment in the best technology in everything from cage and net construction to feeding systems, to regular monitoring and sampling of sediment under cage sites, we ensure that all the necessary steps to safeguard the health of our salmon and of the surrounding areas are taken. To make certain that we live up to the commitment of protecting and maintaining the sustainability of the environment in which we operate, we need to establish Best Management Practices and Policies and as such we have developed this Acoustic Deterrent Policy regarding their use.

Acoustic Deterrent Devices (ADDs), also referred to as Acoustic Harassment Devices (AHDs) are equipment used underneath the surface of the water to deter predators away from our cages. While we continue to advance our predator exclusion systems, such as the use of the steel-core nets, redesign of our grid systems and other technologies, including ADDs, predator interactions are unavoidable given the environment in which we operate.

- Any use of an ADD must be first communicated with and approved by the respective Area and/or Production Manager to ensure that all other preventative measures have been taken.
 - Other factors such as the legality to use such devices or the requirements of certification schemes need to be referred to prior to deployment and your Area and/or Production Manager are your best resources to answer these questions.
- To ensure that non-target species are not negatively impacted, we will limit the use of any ADDs during periods of high population densities. As such, the use of ADDs will NOT BE PERMITTED during the months of June through September.
 - o It is imperative that the devices are removed from the water during this time.

This policy supports our commitments to our Environmental Management System.

Michael Szemerda VP Saltwater Operations Kelly Cove Salmon Ltd.



References

Atlantic Leatherback Turtle Recovery Team, 2006. Recovery strategy for leatherback turtle (Dermochelys coriacea) in Atlantic Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, vi + 45 pp. <u>http://www.registrelepsararegistry.gc.ca/virtual_sara/files/plans/rs_Leatherback_turtle_Atlantic_population_0207_e.p</u> <u>df</u>, accessed June 28, 2016

Atlantic Salmon Federation (ASF), 2013. Aquaculture Facts. <u>http://0104.nccdn.net/1_5/1f2/28c/360/aquaculture-backgrounder2013v2.pdf</u>, updated August 2013, accessed September 25, 2017.

Atlantic Salmon Federation (ASF), 2016a. Atlas of rivers, Nova Scotia, acid-rain impacted. http://atlanticsalmonfederation.org/rivers/novascotia.html, accessed June 22, 2016

Atlantic Salmon Federation (ASF), 2016b. Atlas of rivers, Nova Scotia, present. http://atlanticsalmonfederation.org/rivers/novascotia.html, accessed June 22, 2016

Bay Ferries 2017. Nova Scotia to New Brunswick Ferry. <u>https://www.ferries.ca/nb-ns-ferry/schedule/</u>, accessed September 21, 2017.

Bedford Institute of Oceanography (BIO). 2015a. Spiny Dogfish http://www.bio.gc.ca/sharks/maritime/squalusacanthias-en.php, updated June 16, 2015, accessed June 24, 2016

Bedford Institution of Oceanography (BIO). 2015b. Thorny Skate <u>http://www.bio.gc.ca/science/research-</u> <u>recherche/fisheries-pecheries/rays-raies/atlanticatlantique/ amblyraja-radiata-en.php.</u> updated June 16, 2015, accessed June 24, 2016

Bird Studies Canada (BSC), 2014. Maritimes breeding birds atlas: maps. <u>http://www.mbaaom.ca/isp/map.jsp?lang=en</u>, accessed June 23, 2016

Canadian Shark Research Laboratory, 2012. Shark Fisheries. http://www.marinebiodiversity.ca/shark/english/fisheries.htm, updated October 23, 2012; accessed November 15, 2012.

Clark, D.S., Clark, K.J., Claytor, R., Leslie, S., Melvin, G.D., Porter, J.M., Power, M.J., Stone, H.H. and Waters, C., 2012. Limit reference point for Southwest Nova Scotia / Bay of Fundy spawning component of Atlantic herring, *Clupea harengus* (German Bank and Scots Bay). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/025. iii + 14 p., <u>http://www.dfo-mpo.gc.ca/Csas-sccs/publications/resdocs-docrech/2012/2012</u>025-eng.pdf, accessed June 9, 2016

Clark, K.J., Clark, D.S., Andrushchenko, I.V. and Swain, D.P., 2015. Recovery Potential Assessment (RPA) for the Southern Designatable Unit (NAFO Divisions 4X5Yb and 5Zjm) of Atlantic Cod (*Gadus morhua*). DFO Can. Sci. Advis. Sec. Res. Doc. 2015/069. v + 58 p., <u>http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-</u> <u>DocRech/2015/2015_069-eng.pdf</u>, accessed June 9, 2016

Coastal Communities Network 2005. Nova Scotia Wharves. <u>http://www.closetothecoast.ca/.</u> Archived. Accessed March 2016.

Coffen-Smout, S., Shervill, D., Sam, C., Denton, C. and Tremblay, J., 2013. Mapping inshore lobster landings and fishing effort on a Maritimes Region modified grid system. Can. Tech. Rep. Fish. Aquat. Sci. 3024: 33 pp.



COSEWIC, 2005. COSEWIC assessment and status report on the winter skate Leucoraja ocellata in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa.

http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_winter_skate_e.pdf, accessed June 27, 2016

COSEWIC, 2006. COSEWIC status and stock assessment report on the blue shark Prionace glauca in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii +46 pp. http://www.sararegistry.gc.ca/virtual sara/files/cosewic/sr blue shark e.pdf, accessed June 23, 2016

COSEWIC, 2008. COSEWIC assessment and update status report on the killer whale Orcinus orca, southern resident population, northern resident population, west coast transient population, offshore population and Northwest Atlantic / Eastern Arctic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_killer_whale_0809_e.pdf, accessed June 24, 2016

COSEWIC, 2009a. COSEWIC assessment and status report on the American plaice *Hippoglossoides platessoides* Maritime population, Newfoundland and Labrador population, Arctic population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 74 pp. <u>http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_american_plaice_0809_e.pdf</u>, accessed June 9, 2016

COSEWIC, 2009b. COSEWIC status and stock assessment report on the basking shark Cetorhinus maximus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 56 pp. <u>http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_Basking%20Shark_0810_e1.pdf</u>, accessed June 23, 2016

COSEWIC, 2010a. COSEWIC assessment and status report on the loggerhead sea turtle Caretta Caretta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 75 pp. http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_Loggerhead%20Sea%20Turtle_0810_e.pdf, accessed June 24, 2016

COSEWIC, 2011b. COSEWIC status and stock assessment report on the Atlantic bluefin tuna Thunnus thynnus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 30 pp. <u>http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_atlantic_bluefin_tuna_0911_eng.pdf</u>, accessed June 23, 2016

COSEWIC, 2010c. COSEWIC assessment and status report on the spiny dogfish Squalus acanthias, Atlantic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 50 pp. http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_Spiny%20Dogfish_0810_e1.pdf, accessed June 27, 2016

COSEWIC, 2011b. COSEWIC status and stock assessment report on the Atlantic sturgeon Acipenser oxyrinchus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xiii + 49 pp. <u>http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_Atlantic%20Sturgeon_2011_e.pdf</u>, accessed June 23, 2016

COSEWIC, 2013a. COSEWIC assessment and status report on the White Hake Urophycis\tenuis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii +45 pp. <u>http://www.registrelepsararegistry.gc.ca/virtual_sara/files/cosewic/sr_White%20Hake_2013_e.pdf</u>, accessed June 27, 2016

Rattling Beach NS1039 Finfish Marine Aquaculture Development Plan



COSEWIC, 2013b. Assessment and status report on the piping plover Charadrius melodus. http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Piping%20Plover_2013_e.pdf, accessed June 28, 2016

Digby Courier. 2013. Town and municipality sharing sewer plant. <u>http://www.digbycourier.ca/news/2013/2/24/town-and-municipality-sharing-sewer-plan-3183620.html</u>. Updated February 24, 2013, accessed September 25, 2017.

DFO, 1999. Interaction between wild and farmed Atlantic salmon in the Maritime Provinces. DFO Mar. Reg. Hab. Status Rep. 99/1E. <u>http://www.oldsalmon.ca/docs/issues/interact.pdf</u>, accessed October 10, 2017

DFO, 2012. 2010 Survey of Recreational Fishing in Canada. <u>http://www.dfo-mpo.gc.ca/stats/rec/canada-rec-eng.htm</u>, accessed September 26, 2017

DFO, 2015a. Interim report on Scotian Shelf silver hake (NAFO Divs. 4VWX) stock status. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/004. <u>http://www.dfo-mpo.gc.ca/csas-sccs/publications/scr-rs/2015/2015_004-eng.pdf</u>, accessed June 9, 2016

DFO, 2015b. 2014 assessment of Atlantic halibut on the Scotian Shelf and southern Grand Banks (NAFO Divisions 3NOPs4VWX5Zc). DFO Can. Sci. Advis. Sec. Sci. Advis. Resp. 2015/004. <u>http://www.dfo-mpo.gc.ca/csassccs/publications/scr-rs/2015/2015_004-eng.pdf</u>, accessed June 9, 2016

DFO. 2015c. 2015 assessment of 4VWX herring. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep.2015/040. http://www.dfo-mpo.gc.ca/csas-sccs/publications/sar-as/2015/2015 040-eng.pdf, accessed June 9, 2016

DFO. 2015d. Assessment of Nova Scotia (4VWX) snow crab. DFO Can. Sci. Advis. Sec. Sci.Advis. Rep. 2015/034. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SARAS/2015/2015_034-eng.pdf, accessed June 9, 2016

DFO. 2016. 4VWX herring 2016 Update Report. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2016/036. <u>http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2016/2016_036-eng.pdf</u>, updated July 2016, accessed September 26, 2017

DFO, 2017a. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/034. <u>http://www.dfo-mpo.gc.ca/csas-sccs/publications/sar-as/2014/2014_030-eng.pdf</u>, updated August 2017, accessed September 26, 2017

DFO. 2017b. Assessment of Nova Scotia (4VWX) snow crab. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/033. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_033-eng.pdf, updated August 2017, accessed September 26, 2017

DFO. 2017c. Stock Status of Atlantic Salmon in Salmon Fishing Areas (SFAs) 19-21 and 23. DFO Can. Sci. Advis. Sec. Sci. Resp. 2017/020, <u>http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_020-eng.pdf</u>, accessed September 22, 2017

Digby Courier. 2013. Town and municipality sharing sewer plant. <u>http://www.digbycourier.ca/news/2013/2/24/town-and-municipality-sharing-sewer-plan-3183620.html</u>. Updated February 24, 2013, accessed September 25, 2017.

Environment Canada, Canadian Ice Service, 2010. Sea ice climatic atlas, east coast 1980-2010. http://www.ec.gc.ca/Publications/8DFED3F9-4BD6-49F3-9ACA-F9AA9F52A96D/East Coast 2010 E.pdf, accessed June 20, 2016

Rattling Beach NS1039 Finfish Marine Aquaculture Development Plan



Environment Canada 2012a. Data Sources and Methods: Municipal Wastewater Treatment Indicator. <u>https://www.ec.gc.ca/indicateurs-indicators/48190375-C5F1-4504-9755-409F7E28D3ED/MWWS en.pdf</u>, updated April 2012, accessed September 25, 2017.

Environment Canada. 2012b. Recovery strategy for the piping plover (Charadrius melodus melodus) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. v + 29 pp. <u>http://www.registrelepsararegistry.gc.ca/virtual_sara/files/plans/rs_piping_plover_melodus_e1.pdf</u>, accessed June 28, 2016

Environment and Climate Change Canada, 2016a. Birds protected in Canada under the Migratory Birds Convention Act, 1994. <u>https://www.ec.gc.ca/Nature/default.asp?lang=En&n=496E2702-1</u>, accessed July 5, 2016

Environment Canada, 2017a. Past weather and climate, historical data. <u>http://climate.weather.gc.ca/historical_data/search_historic_data_e.html</u>, accessed September 20, 2017

Environment Canada. 2017b. Protected Areas Network. <u>http://www.ec.gc.ca/ap-pa/ Modified</u>: July 24, 2017. Visited Sept 21, 2017.

Fisheries and Oceans Canada, 2002. Canadian Atlantic pelagic shark integrated fisheries management plan 2002 - 2007. <u>http://www.marinebiodiversity.ca/shark/english/document/2002-2007%20SHARK%20management%20Plan.pdf</u>, accessed November 20, 2012.

Fisheries and Oceans Canada. 2006. Recovery strategy for the Atlantic whitefish (Coregonus huntsmani) in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, xiii + 42 pp, http://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_Atlantic_Whitefish_0207_e.pdf, accessed June 23, 2016

Fisheries and Oceans Canada (Ocean and Ecosystem Science), 2007. DFO Temperature – Scotian Shelf / Gulf of Maine Environment Canada 2012. Data Sources and Methods: Municipal Wastewater Treatment Indicator. <u>https://www.ec.gc.ca/indicateurs-indicators/48190375-C5F1-4504-9755-409F7E28D3ED/MWWS_en.pdf</u>, updated April 2012, accessed September 25, 2017.

Fisheries and Oceans Canada. 2010. Atlantic Whitefish. <u>http://www.dfo-mpo.gc.ca/speciesespeces/profiles-profils/whitefish-coregone-eng.html</u>, updated August 10, 2010, accessed June 24, 2016

Fisheries and Oceans Canada, 2011. Status of Atlantic salmon in salmon fishing areas (SFAs) 19-21 and 23. DFO Can. Sci. Advis. Sec. Sci. Resp. 2011/005, <u>http://www.dfo-mpo.gc.ca/Csas-sccs/publications/ScR-RS/2011/2011_005-eng.pdf</u>, accessed June 8, 2016

Fisheries and Oceans Canada, 2013. Assessment of Information on Irish moss, rockweed and kelp harvests in Nova Scotia. <u>http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2013/2013_004-eng.pdf</u>, updated March 2013, accessed September 26, 2017

Fisheries and Oceans Canada, 2014a. Fisheries. <u>http://www.inter.dfo-</u> <u>mpo.gc.ca/Maritimes/Oceans/OCMD/Atlas/Fisheries</u>, last updated March 4, 2014; accessed June 9, 2016

Fisheries and Oceans Canada, 2014b. Seafisheries, 2014 value of Atlantic coast commercial landings, by region (thousand dollars). <u>http://www.dfo-mpo.gc.ca/stats/commercial/landdebarg/sea-maritimes/s2014av-eng.htm</u>, accessed June 9, 2016



Fisheries and Oceans Canada, 2015a. Fisheries sustainability – swordfish.<u>http://www.dfompogc.ca/fm-gp/sustainable-durable/fisheries-peches/swordfish-espadon-eng.htm</u>, updated March 6, 2015; accessed June 1, 2016

Fisheries and Oceans Canada, 2015b. Fisheries sustainability – snow crab. <u>http://www.dfompo.gc.ca/fm-gp/sustainable-</u> <u>durable/fisheries-peches/snow-crab-eng.htm</u>, updated March 6, 2015; accessed June 1, 2016

Fisheries and Oceans Canada, 2015c. Fisheries sustainability – shrimp. <u>http://www.dfompo.gc.ca/fm-gp/sustainable-</u> <u>durable/fisheries-peches/shrimp-crevette-eng.htm</u>, updated March 6, 2015; accessed June 1, 2016

Fisheries and Oceans Canada, 2015d. Smooth Skate (Laurentian-Scotian Population) <u>http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/smoothskate-raievelours-LSeng.html</u>, updated September 4, 2015; accessed June 24, 2016

Fisheries and Oceans, 2015e. Status of Atlantic salmon in salmon fishing areas (SFAs) 19-21 and 23. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/021, <u>http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_021-eng.pdf</u>, accessed June 8, 2016

Fisheries and Oceans Canada, 2016a. Canadian Atlantic swordfish and other tunas. <u>http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espadon/swordfish-2004-espadon-eng.htm</u>, updated December 14, 2017, accessed September 26, 2017

Fisheries and Oceans Canada, 2016b. Assessment of Scallops (Placopecten magellanicus) in scallop production areas 1 to 6 in the Bay of Fundy. DFO Can. Sci. Advis. Sec. Sci. Advis.Rep. 2016/004, http://publications.gc.ca/collections/collection_2016/mpo-dfo/Fs70-6-2016-004-eng.pdf, accessed October 17, 2016

Fisheries and Oceans Canada. 2016c. Marine Protected Areas (MPA). <u>http://www.dfompo.gc.ca/oceans/mpa/index-eng.htm</u>l, update June 24, 2016 accessed July 7, 2016

Fisheries and Oceans Canada, 2017a. 2015 Atlantic coast commercial landings, by region. <u>http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritimes/s2015ag-eng.htm</u>, updated February 3, 2017, accessed September 26, 2017

Fisheries and Oceans Canada, 2017b. 2015 Value of Atlantic Landings. <u>http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritimes/s2015av-eng.htm</u>, last updated January 24, 2107, accessed September 26, 2017

Fisheries and Oceans Canada, 2017c. Haddock. <u>http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/haddock-aiglefin-eng.html</u>, last updated March 3, 2017, accessed September 26, 2017

Fisheries and Oceans Canada, 2017d. 2015 Volume of Atlantic Landings. <u>http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritimes/s2015aq-eng.htm</u>, updated February 3, 2017, accessed September 26, 2017

Fisheries and Oceans Canada, 2017e. Assessment of Scallops (*Placopecten magellanicus*) in scallop production areas 1 to 6 in the Bay of Fundy. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 201/002, <u>http://publications.gc.ca/collections/collection_2017/mpo-dfo/Fs70-7-2017-002-eng.pdf</u>, updated February 2017, accessed September 26, 2017



Fisheries and Oceans Canada 2017f. Tides, Currents, and Water Levels. http://www.tides.gc.ca/eng/find/region/5, accessed September 22, 2017

Fisheries and Oceans Canada, 2017g. Oceanography and Scientific Data, Prince 5 Station, hydrographic data, <u>http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/azmp-pmza/hydro/station/yearly-annuelle-eng.html?a=1&y=2016</u>, updated November 23, 2016; accessed September 25, 2017

Food and Agriculture Organization of the United Nations (FAO). 2003. General situation of world fish stocks. <u>http://www.fao.org/newsroom/common/ecg/1000505/en/stocks.pdf</u>, accessed October 8, 2016

Gibson, A.J.F., Bowlby, H.D. Sam, D.L. and Amiro. P.G., 2009. Review of DFO Science information for Atlantic salmon (*Salmo salar*) populations in the Southern Upland region of Nova Scotia. Can. Sci. Adv. Sec. Res. Doc. 2009/081

Hibbard, J.P., van Staal, C.R., Rankin, D.W. and Williams, H. 2006. Lithotectonic map of the Appalachian Orogen, Canada-United States of America; Geological Survey of Canada, Map 2096A, scale 1:1,500,000

i-Boating. 2017. Free Marine Navigation Charts and Fishing Maps. <u>http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html#11.62/44.6505/-65.6940</u>. Accessed October 31 2017.

Important Bird Areas Canada, 2016. IBA Canada important bird areas. http://www.ibacanada.com/mapviewer.jsp?lang=EN, accessed August 30, 2016

International Commission for the Conservation of Atlantic Tunas (ICCAT), 2014. Stock assessments. https://www.iccat.int/en/assess.htm, updated December 11, 2014; accessed June 1, 2016

The IUCN Red List of Threatened Species. 2009. Leucoraja ocellata.<u>http://www.iucnredlist.org/details/161631/0</u>, accessed June 24, 2016

Keppie, J.D. (compiler), 2000. Geological map of the province of Nova Scotia. Nova Scotia Department of Natural Resources. Minerals and Energy Branch, Map ME 2000-1, scale 1:500,000

Lacroix, G.L. and Knox, D. 2005. Acidification status of rivers in several regions of Nova Scotia and potential impacts on Atlantic salmon. Can. Tech. Rep. Fish. Aquat. Sci. 2573: v + 71 p.

Lawton, P., 1993. Salmon aquaculture and the traditional invertebrate fisheries of the Fundy Isles region: habitat mapping and impact definition. Cooperation Agreement on Fisheries and Aquaculture Development Contract Number 291.303

MacLaren and Plansearch Limited, 1991. Wind and Wave Climate Atlas, Volume 1, The east coast of Canada, Transport Canada.

Maritime Museum of the Atlantic. 2016. Marine Heritage Database; Annapolis Basin. http://novascotia.ca/museum/wrecks/wrecks/, updated October 5, 2007, accessed July 5, 2016

Municipality of Digby. 2017a. Key Economic Sectors. <u>https://www.digbydistrict.ca/key-economic-sectors.html</u>, accessed September 25, 2017.

Municipality of Digby. 2017b. Public Works. <u>https://www.digbydistrict.ca/public-works.html.</u> Accessed September 22, 2017.



Natanson, L.J., Sulikowski, J.A., Kneebone, J.R. and Tsang, P.C., 2007. Age and growth estimates for the smooth skate, Malacoraja senta, in the Gulf of Maine. Enivron Biol Fish 80: 293-308

National Oceanic and Atmospheric Administration (NOAA). 2017. National Data Buoy Center. <u>http://www.ndbc.noaa.gov/</u> updated July 7, 2017, accessed September 20, 2017

Nova Scotia Canada. 2016. Species at Risk Overview <u>http://novascotia.ca/natr/wildlife/biodiversity/species-list.asp</u>, updated Nov. 27, 2015; accessed June 24, 2016

Nova Scotia Department of Fisheries and Aquaculture (NSDFA), 2013. 2013 Nova Scotia commercial landings. <u>http://novascotia.ca/fish/documents/commercial-stats/2013 NS Commercial Landings.pdf</u>, accessed September 26, 2017

Nova Scotia Department of Fisheries and Aquaculture (NSDFA), 2014. Industry overview. http://novascotia.ca/fish/commercial-fisheries/industry-overview/, accessed September 26, 2017

Nova Scotia Department of Fisheries and Aquaculture (NSDFA). 2017. Sportfishing Guides. https://novascotia.ca/fish/sportfishing/sportfishing-guides/#area-five, accessed October 11, 2017

Nova Scotia Environment, 2016. Nova Scotia's Protected Areas. <u>http://www.novascotia.ca/nse/protectedareas/map.asp</u>, accessed August 29, 2016

Nova Scotia Department of Natural Resources (NSDNR). 2016. Significant Species and Habitats Database. <u>https://nsgi.novascotia.ca/plv/</u>, accessed June 23, 2016

Nova Scotia Federation of Agriculture. 2014. Statistical Profile of Digby County. <u>http://nsfa-fane.ca/wp-content/uploads/2011/06/Statistical-Profile-of-Digby-County.pdf</u>. accessed September 22, 2017.

Nova Scotia Fisheries Sector Council. 2017. Processing Companies. <u>http://www.nsfsc.ca/processingcompanies.html</u>. accessed September 21, 2017.

NSLC Adopt a Stream, 2017. NSLC Adopt a Stream – Groups and Projects. <u>http://adoptastream.ca/groups-and-projects</u>, accessed October 6, 2017

O'Boyle, 2012. Fish stock status and commercial fisheries: state of the Scotian Shelf report. Fisheries and Oceans Canada. <u>http://coinatlantic.ca/docs/fish-stock-status-and-commercial-fisheries.pdf</u>, accessed June 9, 2016

Port of Digby 2017. Facilities and Services. <u>http://www.portofdigby.ca/facilities-and-services</u>, Accessed September 21, 2017.

Ramsar. 2017. Wetlands in Canada. <u>http://www.ramsar.org/wetland/canada</u>, accessed October 2, 2017.

Seafish. 2015. Northern shrimp (*Pandalus borealis*) in Canadian waters, shrimp fishing areas (SFAs) 13-16, shrimp trap. www.seafish.org/rass/do_pdf.php?id=2496§ion=all_updated October 2015, accessed June 1, 2016

Serdynska, A. and Coffen-Smout, S. 2017. Mapping Inshore Lobster Landings and Fishing Effort on a Maritimes Region Statistical Grid (2012-2014). <u>http://publications.gc.ca/collections/collection_2017/mpo-dfo/Fs97-6-3177-eng.pdf</u>, accessed September 26, 2017



Showell, M.A., Themelis, D., Mohn, R.K. and Comeau, P.A., 2013. Haddock on the Southern Scotian Shelf and Bay of Fundy in 2011 (NAFO Division 4X5Y). DFO Can. Sci. Advis.

Statistics Canada. 2017a. Digby TY [Census division], Nova Scotia and Digby, CTY [Census division], Nova Scotia (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released September 13, 2017. <u>http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E</u>, accessed September 22, 2017

Statistics Canada 2017b. Table 004-0200 – Census of Agriculture, farms classified by the North American Industry Classification System (NAICS), every 5 years (number), CANSIM (database). Accessed September 22, 2017.

Statistics Canada. 2013a. Bear River (Part) 6, IRI, Nova Scotia (Code 1203009) (table). National Household Survey (NHS) Profile. 2011 National Household Survey. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. <u>http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E</u> Released September 11, 2013; accessed June 8, 2016.

Statistics Canada. 2013b. Yarmouth 33, IRI, Nova Scotia (Code 1202040) (table). National Household Survey (NHS) Profile. 2011 National Household Survey. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. <u>http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E</u> Released September 11, 2013; accessed June 8, 2016.

Statistics Canada. 2013c. Gold River 21, IRI, Nova Scotia (Code 1206011) (table). National Household Survey (NHS) Profile. 2011 National Household Survey. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. <u>http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E</u> Released September 11, 2013; accessed June 8, 2016.

The Salmon Atlas, 2016. Atlantic salmon rivers of Nova Scotia, Canada. <u>http://www.salmonatlas.com/atlanticsalmon/canada-east/nova-scotia/mapnovascotia.html</u>, accessed July 5, 2016.

Transboundary Resource Assessment Committee (TRAC), 2010. Atlantic mackerel in the Northwest Atlantic. TRAC Status Report 2010/01. <u>http://www.bio.gc.ca/info/intercol/trac-cert/documents/reports/TSR 2010 01 E.pdf</u>, accessed June 9, 2016

Western Hemisphere Shorebird Reserve Network 2017. Bay of Fundy. <u>www.whsrn.org</u> visited Sept 21, 2017

From: Winfield, Lynn
Sent: June 22, 2018 11:55 AM
To: 'Jeff Nickerson' <jnickerson@cookeaqua.com>; Jennifer Hewitt < @cookeaqua.com>
Cc: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>; Feindel, Nathaniel J
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<Jessica.Feindel@novascotia.ca>; Hanrahan, Joe <Joe.Hanrahan@novascotia.ca>
Subject: AQ#1039 Boundary Amendment - Additional Information Request

Good Afternoon Jeff and Jennifer,

Please see the attached letter and attachment.

I will put an original copy in the mail to you today.

If you have any questions please let me know.

Thanks,

Lynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

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Information Boundary Required from Kelly Amendment Additio

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Environment and Climate Change	KCS Response
Canada's Canadian Wildlife Service	
Comments It should be clarified whether grow lights are	
nronosed for this site Bright lights can cause	
problems for night migrating hirds and night-	
flying sophirds (o.g. storm patrols) ospecially	
during pariods of fag. drizzle, and haze. A	
noworful populi of light chining unwords into	
the feet can appear as a corrider through	
the log can appear as a corridor through	
darkness into which the birds fly. Birds then	
get killed or injured by flying into the lit	
object, by flying into the light itself, or by	
colliding with other birds. For those that	
don't get killed or injured but flutter in the	
light pencil for a long period, they may	
deplete their energy reserves and either die	
of exhaustion or drop to the ground where	
they are at risk from predators. In order to	
avoid impacts on migratory birds, it is	
recommended that lights be <u>shielded and</u>	
aimed downwards.	
On page 95, it is stated that " if a predator	
cannot be deterred and is threatening the	
security of the containment, it may be	
dispatched in accordance with Government	
Policy and Saltwater Management	
consent." The proponent should clarify its	
measures to deal with migratory birds that	
are potential predators of fish, keeping in	
mind its obligations under the Migratory	
Birds Convention Act and associated	
regulations.	

Mitigation Measures Provided by Environment and Climate Change Canada's Canadian Wildlife Service

- Food scraps and other garbage left on beaches and other coastal habitat can artificially enhance the populations of avian and mammalian predators of eggs and chicks of migratory birds. A similar effect could occur if gulls are attracted and have access to excess feed. The proponent should ensure that no litter (including food wastes) is left in coastal areas staff and/or contractors. Also, the feed program should be managed to minimize waste, and should include use of tarps to prevent bird access to fish feed.
- Project staff/contractors and vessels should not approach concentrations of seabirds, waterfowl or shorebirds.
- Project staff/contractors should use well muffled vessels.
- Beaches and wetlands are sensitive habitats and proponents should not utilize these habitats for construction, operational or decommissioning activities, with the exception of beach clean-up activities, which should be timed to not coincide with sensitive periods for breeding birds and other wildlife.
- Since even small spills of oil can have very serious effects on migratory birds, every effort should be taken to ensure that no oil spills occur. The proponents should ensure that all precautions are taken by the contractors and staff to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared.

Applicable Legislation

The *Migratory Birds Convention Act* (MBCA) protects most bird species in Canada however, some families of birds are excluded. A list of species under MBCA protection can be found at <u>https://ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1</u>.

Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

"5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds."

It is the responsibility of the proponent to ensure that activities comply with the MBCA and regulations. In fulfilling its responsibility for MBCA compliance, the proponent should take the following points into consideration:

- Information regarding regional nesting periods can be found at <u>http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1</u>. Some species protected under the MBCA may nest outside these timeframes
- Most migratory bird species construct nests in trees (sometimes in tree cavities) and shrubs, but several species nest at ground level (e.g., Common Nighthawk, Killdeer, sandpipers), in hay fields, pastures or in burrows. Some bird species may nest on cliffs or in stockpiles of overburden material from mines or the banks of quarries. Some migratory birds (including certain waterfowl species) may nest in head ponds created by beaver dams. Some migratory birds (e.g., Barn Swallow, Cliff Swallow, Eastern Phoebe) may build their nests on structures such as bridges, ledges or gutters.
- One method frequently used to minimize the risk of destroying bird nests consists of avoiding certain activities, such as clearing, during the regional nesting period for migratory birds.
- The risk of impacting active nests or birds caring for pre-fledged chicks, discovered during
 project activities outside the regional nesting period, can be minimized by measures such
 as the establishment of vegetated buffer zones around nests, and minimization of activities
 in the immediate area until nesting is complete and chicks have naturally migrated from the
 area. It is incumbent on the proponent to identify the best approach, based on the
 circumstances, to complying with the MBCA.

Further information can be found at http://www.ec.gc.ca/paomitmb/default.asp?lang=En&n=C51C415F-1

The proponent should also be reminded that the prohibitions under the *Species at Risk Act* (SARA) are now in force. The complete text of SARA, including prohibitions, is available at <u>www.sararegistry.gc.ca</u>.



www.gov.ns.ca

BOUNDARY AMENDMENT AQ#1039

June 22, 2018

Kelly Cove Salmon Ltd. ATTN: Mr. Jeff Nickerson 134 North Street, Bridgewater, NS B4V 2V6

Dear Jeff:

Re: Boundary Amendment Application – AQ#1039 Annapolis Basin, Digby County, N.S.

As part of the application process for Aquaculture applications, the Nova Scotia Department of Fisheries and Aquaculture consults with a variety of provincial and federal government departments and agencies. During the review of the above-noted application, the Canadian Wildlife Service - Environment and Climate Change Canada (CWS-ECCC) has requested:

- 1. That you provide further information with respect to the two items on Page 1 of the attached table;
- 2. That you be provided with the information on Pages 2 and 3 of the attached table.

Please provide your written response to the two items for which CWS-ECCC has requested additional information. Your responses will be forwarded to CWS-ECCC for review and further comment.

Please contact me at telephone (902) 875-7440, fax (902) 875-7429 or email Lynn. Winfield@novascotia.ca if you have any questions or concerns.



EVLynn Winfield, Licensing Coordinator

c. Nathaniel Feindel, Manager of Aquaculture Development Jessica Feindel, Manager of Aquaculture Operations Brennan Goreham, Manager of Licensing Joe Hanrahan, Coastal Resource Coordinator Melinda Watts, Aquaculture Advisor Jennifer Hewitt, Cooke Aquaculture From: Jennifer Hewitt @@cookeaqua.com> Sent: July 5, 2018 4:05 PM To: Winfield, Lynn <Lynn.Winfield@novascotia.ca> Subject: requested information for KCS boundary amendment

Lynn – please see attached and let me know if you need anything further, Jen

Jennifer Hewitt

Kelly Cove Salmon Ltd. Compliance Manager, NS

P.O Box 33, 134 North Street Bridgewater, NS B4V 2V6



Environment and Climate Change	KCS Response
Canada's Canadian Wildlife Service Comments	
Comments It should be clarified whether grow lights are proposed for this site. Bright lights can cause problems for night migrating birds and night- flying seabirds (e.g. storm-petrels), especially during periods of fog, drizzle, and haze. A powerful pencil of light shining upwards into the fog can appear as a corridor through darkness into which the birds fly. Birds then get killed or injured by flying into the lit object, by flying into the light itself, or by colliding with other birds. For those that don't get killed or injured but flutter in the light pencil for a long period, they may deplete their energy reserves and either die of exhaustion or drop to the ground where they are at risk from predators. In order to avoid impacts on migratory birds, it is	Kelly Cove Salmon (KCS) uses underwater lights to manipulate photoperiod during the winter months to prevent fish from early maturation. High maturation rates lead to high downgrades at harvest. This site will use LED lighting to manipulate the photoperiod. KCS have done extensive work in determining the best type of lighting to achieve the desired effect and it has been found that using LED lights on the blue spectrum have the best results. Additionally, all lighting is pointed downward and shades are used to direct the light down into the cage where the fish are. There is extremely low levels of light pollution emanating from the cages unlike the early years of using underwater lights.
recommended that lights be <u>shielded and</u> aimed downwards.	
On page 95, it is stated that " if a predator cannot be deterred and is threatening the security of the containment, it may be dispatched in accordance with Government Policy and Saltwater Management consent." The proponent should clarify its measures to deal with migratory birds that are potential predators of fish, keeping in mind its obligations under the <i>Migratory</i> <i>Birds Convention Act</i> and associated regulations.	Under no circumstances will a migratory bird or Specie at risk be dispatched. Our main line of defence is keeping the farm clear of feed and organics that could attract birds. Secondly, we use predator netting to keep birds away from the fish. Migratory birds are protected under the Migratory Birds Convention Act and some species are also protected under the Species at Risk Act (SARA); this protection can extend to the point where even handling these species is not allowed without a Canadian Wildlife Service Permit. In the event that a migratory or Specie at risk bird becomes tangled in our predator netting, Canadian Wildlife Services will be contacted immediately (506-364-5068) for further direction.

Mitigation Measures Provided by Environment and Climate Change Canada's Canadian Wildlife Service

- Food scraps and other garbage left on beaches and other coastal habitat can artificially enhance the populations of avian and mammalian predators of eggs and chicks of migratory birds. A similar effect could occur if gulls are attracted and have access to excess feed. The proponent should ensure that no litter (including food wastes) is left in coastal areas staff and/or contractors. Also, the feed program should be managed to minimize waste, and should include use of tarps to prevent bird access to fish feed.
- Project staff/contractors and vessels should not approach concentrations of seabirds, waterfowl or shorebirds.
- □ Project staff/contractors should use well muffled vessels.
- Beaches and wetlands are sensitive habitats and proponents should not utilize these habitats for construction, operational or decommissioning activities, with the exception of beach clean-up activities, which should be timed to not coincide with sensitive periods for breeding birds and other wildlife.
- Since even small spills of oil can have very serious effects on migratory birds, every effort should be taken to ensure that no oil spills occur. The proponents should ensure that all precautions are taken by the contractors and staff to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared.

Applicable Legislation

The *Migratory Birds Convention Act* (MBCA) protects most bird species in Canada however, some families of birds are excluded. A list of species under MBCA protection can be found at https://ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1.

Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

"5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds."

It is the responsibility of the proponent to ensure that activities comply with the MBCA and regulations. In fulfilling its responsibility for MBCA compliance, the proponent should take the following points into consideration:

- □ Information regarding regional nesting periods can be found at <u>http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1</u>. Some species protected under the MBCA may nest outside these timeframes
- Most migratory bird species construct nests in trees (sometimes in tree cavities) and shrubs, but several species nest at ground level (e.g., Common Nighthawk, Killdeer, sandpipers), in hay fields, pastures or in burrows. Some bird species may nest on cliffs or in stockpiles of overburden material from mines or the banks of quarries. Some migratory birds (including certain waterfowl species) may nest in head ponds created by beaver dams. Some migratory birds (e.g., Barn Swallow, Cliff Swallow, Eastern Phoebe) may build their nests on structures such as bridges, ledges or gutters.
- One method frequently used to minimize the risk of destroying bird nests consists of avoiding certain activities, such as clearing, during the regional nesting period for migratory birds.
- □ The risk of impacting active nests or birds caring for pre-fledged chicks, discovered during project activities outside the regional nesting period, can be minimized by measures such as the establishment of vegetated buffer zones around nests, and minimization of activities in the immediate area until nesting is complete and chicks have naturally migrated from the area. It is incumbent on the proponent to identify the best approach, based on the circumstances, to complying with the MBCA.

Further information can be found at http://www.ec.gc.ca/paomitmb/default.asp?lang=En&n=C51C415F-1

The proponent should also be reminded that the prohibitions under the *Species at Risk Act* (SARA) are now in force. The complete text of SARA, including prohibitions, is available at <u>www.sararegistry.gc.ca</u>.

From: Winfield, Lynn
Sent: July 9, 2018 9:00 AM
To: 'Gautreau, Rachel (EC)' <rachel.gautreau@canada.ca>
Cc: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Subject: Boundary amendment of existing aquaculture lease #1039 - Digby County, N.S.

Good Morning Rachel,

Please see the below additional information provided by Kelly Cove Salmon:

Environment and Climate	KCS Response
Change Canada's Canadian	
Wildlife Service	
Comments	
It should be clarified whether	Kelly Cove Salmon (KCS) uses underwater lights to manipulate
grow lights are proposed for this	photoperiod during the winter months to prevent fish from early
site. Bright lights can cause	maturation. High maturation rates lead to high downgrades at
problems for night migrating	harvest. This site will use LED lighting to manipulate the
birds and night- flying seabirds	photoperiod. KCS have done extensive work in determining the best
(e.g. storm-petrels), especially	type of lighting to achieve the desired effect and it has been found
during periods of fog, drizzle, and	that using LED lights on the blue spectrum have the best results.
haze. A powerful pencil of light	Additionally, all lighting is pointed downward and shades are used to
shining upwards into the fog can	direct the light down into the cage where the fish are. There is
appear as a corridor through	extremely low levels of light pollution emanating from the cages
darkness into which the birds fly.	unlike the early years of using underwater lights.
Birds then get killed or injured by	
flying into the lit object, by flying	
into the light itself, or by colliding	
with other birds. For those that	
don't get killed or injured but	
flutter in the light pencil for a	
long period, they may deplete	
their energy reserves and either	
die of exhaustion or drop to the	
ground where they are at risk	
from predators. In order to avoid	
impacts on migratory birds, it is	
recommended that lights be	
<u>shielded and</u>	
aimed downwards.	

On page 95, it is stated that " if	Under no circumstances will a migratory bird or Specie at risk be
a predator cannot be deterred	dispatched. Our main line of defence is keeping the farm clear of
and is threatening the security of	feed and organics that could attract birds. Secondly, we use predator
the containment, it may be	netting to keep birds away from the fish.
dispatched in accordance with	Migratory birds are protected under the Migratory Birds Convention
Government Policy and Saltwater	Act and some species are also protected under the Species at Risk
Management consent." The	Act (SARA); this protection can extend to the point where even
proponent should clarify its	handling these species is not allowed without a Canadian Wildlife
measures to deal with migratory	Service Permit. In the event that a migratory or Specie at risk bird
birds that are potential	becomes tangled in our predator netting, Canadian Wildlife Services
predators of fish, keeping in	will be contacted immediately (506-364-5068) for further direction.
mind its obligations under the	
Migratory Birds Convention Act	
and associated	
regulations.	

If you have any questions please do not hesitate to contact me.

Thanks, Lynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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From: Gautreau, Rachel (EC) <rachel.gautreau@canada.ca> Sent: July 9, 2018 10:10 AM To: Winfield, Lynn <Lynn.Winfield@novascotia.ca> **Cc:** Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>; Hanson, AI (EC) <al.hanson@canada.ca> **Subject:** RE: Boundary amendment of existing aquaculture lease #1039 - Digby County, N.S.

Thanks Lynn. We have no further comments at this time. Rachel APPENDIX F – NOVA SCOTIA ENVIRONMENT

From: Winfield, Lynn
Sent: March 20, 2018 2:36 PM
To: Labor, Peter <Peter.Labor@novascotia.ca>
Subject: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Nova Scotia Environment. From: Winfield, Lynn
Sent: March 20, 2018 2:46 PM
To: Labor, Peter <Peter.Labor@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Power, Luke X
Sent: Tuesday, March 20, 2018 3:13 PM
To: Winfield, Lynn <<u>Lynn.Winfield@novascotia.ca</u>>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Hi Lynn,

Boundary amendments for NSE review should be directed to me as I coordinate response from Peter and Conservation Enforcement staff. Can you forward me the materials for 1039?

Thanks, Luke

Luke Power Manager of Policy and Planning Nova Scotia Environment (902) 266-9815

CONFIDENTIALITY STATEMENT: This communication is intended only for the use of the person or entity named above. It may contain confidential or legally privileged information. If you are not the intended recipient or the person responsible for delivering messages or communications to the intended recipient, please accept this as formal notification that any use, distribution, or copying of this communication or any of the information contained in it is strictly prohibited. If you have received this communication in error, please notify me immediately and then destroy or delete this communication.

From: Winfield, Lynn
Sent: March 20, 2018 3:53 PM
To: Power, Luke X <Luke.Power@novascotia.ca>
Cc: Goreham, Brennan CD <Brennan.Goreham@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture




*Attachments in this email are included within the correspondence above.

From: Winfield, Lynn
Sent: May 3, 2018 10:39 AM
To: Power, Luke X <Luke.Power@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Winfield, Lynn
Sent: Thursday, August 16, 2018 10:52 AM
To: Labor, Peter; Power, Luke X
Subject: FW: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for the proposed amendment to Aquaculture finfish Licence and Lease #1039 in St. Mary's Bay, Digby County. Your comments are requested on or before September 6, 2018.

Sincerely,

Lynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture From: Power, Luke X
Sent: August 16, 2018 9:44 PM
To: Winfield, Lynn <<u>Lynn.Winfield@novascotia.ca</u>>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Hi Lynn:

The previous thread on this request for comment appears to have been due in May? I may have missed some emails.. Perhaps we should connect tomorrow to discuss?

Thanks. Luke

From: Winfield, Lynn
Sent: August 17, 2018 8:32 AM
To: Power, Luke X <<u>Luke.Power@novascotia.ca</u>>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Morning Luke,

I believe that the email from March 20th was only send to Peter Labour, Sorry for that.

Any questions just give me a call 902-875-7440, I should be here all day.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Power, Luke X <Luke.Power@novascotia.ca>
Sent: August 27, 2018 4:00 PM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Hi Lynn:

No comments on this site.

Thanks, Luke

Luke Power Manager of Policy and Planning Nova Scotia Environment (902) 266-9815 CONFIDENTIALITY STATEMENT: This communication is intended only for the use of the person or entity named above. It may contain confidential or legally privileged information. If you are not the intended recipient or the person responsible for delivering messages or communications to the intended recipient, please accept this as formal notification that any use, distribution, or copying of this communication or any of the information contained in it is strictly prohibited. If you have received this communication in error, please notify me immediately and then destroy or delete this communication.

APPENDIX G – NOVA SCOTIA DEPARTMENT OF AGRICULTURE

From: Winfield, Lynn Sent: Tuesday, March 20, 2018 2:37 PM To: Miller, L (Dawn) <<u>Dawn.Miller2@novascotia.ca</u>> Subject: Boundary Amendment - #1039 Annapolis Basin

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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1039 Amendment -NS Agriculture - Mei



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MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Nova Scotia Department of Agriculture. From: Winfield, Lynn
Sent: March 20, 2018 2:46 PM
To: Miller, L (Dawn) <Dawn.Miller2@novascotia.ca>
Subject: RE: Boundary Amendment - #1039 Annapolis Basin

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

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All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Winfield, Lynn Sent: May 3, 2018 10:41 AM To: Miller, L (Dawn) <Dawn.Miller2@novascotia.ca> Subject: RE: Boundary Amendment - #1039 Annapolis Basin

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Miller, L (Dawn) <Dawn.Miller2@novascotia.ca>
Sent: May 16, 2018 9:35 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: 171009 FINAL Network Agency Review Form_Agr response 16 05 18

Please see the attached document.

Dawn Miller, MSc., P.Ag. Resource Management Specialist Nova Scotia Department of Agriculture 176 College Road – Harlow Building PO Box 190 Truro, Nova Scotia B2N 5G6

Telephone: 902-893-6548 Fax: 902-893-0244 Mobile: 902-890-3377 E-mail: <u>Dawn.Miller2@novascotia.ca</u>



Network Agency Review of an Aquaculture Application

Agency	Agriculture
Division (if applicable)	Animal and Crop Protection
Reviewer	Dawn Miller
Title of Reviewer	Resource Management Specialist
Date	16 May 2018
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- \boxtimes $% \ensuremath{\mathbb{N}}$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

See attached.

Public Notice and Disclosure

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Privacy Statement

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Hey Dawn,

You're correct, there is nothing of concern in that area from an agricultural perspective.

Terry

Terry McKay P.Ag. Agricultural Resource Coordinator Cornwallis NS 902-247-4420 Terry.McKay@novascotia.ca

From: Miller, L (Dawn)
Sent: Tuesday, May 15, 2018 2:14 PM
To: McKay, Terry W <<u>Terry.McKay@novascotia.ca</u>>
Subject: FW: Boundary Amendment - #1039 Annapolis Basin

Hello Terry,

We have received a boundary amendment notification for an aquaculture site in the Digby area. This appears to be a straightforward amendment to boundaries of an existing site and I do not foresee any problems or objections from an Ag perspective. Before I reply, though, I wanted to touch base with you to confirm that thinking.

Thank you,

Dawn

Dawn Miller, MSc., P.Ag. Resource Management Specialist Nova Scotia Department of Agriculture 176 College Road – Harlow Building PO Box 190 Truro, Nova Scotia B2N 5G6

Telephone: 902-893-6548 Fax: 902-893-0244 Mobile: 902-890-3377 E-mail: <u>Dawn.Miller2@novascotia.ca</u> APPENDIX H – NOVA SCOTIA MUNICIPAL AFFAIRS (MUNICIPAL NOTIFICATION) From: Winfield, Lynn
Sent: March 22, 2018 11:36 AM
To: Paton, Andrew <Andrew.Paton@novascotia.ca>
Subject: Amendment Notification - AQ#1039 - Annapolis Basin, Digby

Good Morning Mr. Paton,

Attached you will see a copy of the Notification Letter, Network Memo and Maps that is being mailed to Municipality of Digby. If you have any questions, please let me know.

Thanks

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca NS Department of Fisheries & Aquaculture Website

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PXF

PXF

Mun of Digby Notification Letter A

NETWORK MEMO.pdf



novascotia.ca

March 19, 2018

Municipality of Digby Linda Fraser, CAO and Council 12548 Hwy 217 – Seabrook, PO Box 429, Digby, NS B0V 1A0

Dear CAO & Council:

Re: Notification of Proposed Amendment to Aquaculture Licence/Lease No. 1039, Annapolis Basin (Rattling Beach), Digby County

In an effort to keep communities better informed about aquaculture activities in their area, the Province of Nova Scotia is beginning to contact municipalities directly to inform them of proposed applications for amendments to existing sites.

The purpose of this letter is to notify the Municipality of Digby of a proposed aquaculture site amendment to Aquaculture Licence/Lease No. 1039 located in Annapolis Basin (Rattling Beach), in the County of Digby. Please see enclosed information and maps regarding this application.

We do not require your feedback; however, you are more than welcome to contact our department directly if you have any questions. You can reach me by phone at 902-875-7440 or by email Lynn.Winfield@novascotia.ca.

Lynn winnen Licensing Coordinator Nova Scotia Department of Fisheries and Aquaculture

c. Andrew Paton

Enclosure: Network Memo and Maps

Schedule A GPS COORDINATE INFORMATION SHEET

Proposed Expansion #: 1039x

Applicant:	Kelly Cove Salmon Ltd.		
Location:	Annapolis Basin	County:	Digby
Hydrographic Chart:	4396	Orthophoto #	•
Dimensions of site:	Approx. 190m x 180m x 720m x 370n 625m x 282m	Size:	Approx. 29.10 ha.

Approximate Coordinates of Application:

Datum used:			NAD 8	33		
Centre coordi	nates (Ap	prox.)	Lat. Long.	44° 39' 12. -65° 45' 18.	68" 47"	
Corner #1	Lat. Long.	44° 39' 27.69" -65° 45' 24.29"		Corner #2	Lat. Long.	44° 39' 28.17" -65° 45' 15.70"
Corner #3	Lat. Long.	44° 39' 22.82" -65° 45' 12.46"		Corner #4	Lat. Long.	44° 38' 59.59" -65° 45' 09.59"
Corner #5	Lat. Long.	44° 38' 58.53" -65° 45' 26.32	19	Corner #5	Lat. Long.	44° 38' 58.53" -65° 45' 26.32"

Note: The coordinates and dimensions for this site have been taken from the survey.







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MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

Application No. 1039 – Marine Cage Culture Proponent: Kelly Cove Salmon Ltd. Current Size: 8.74 HA New Size: 29.08HA Species – Atlantic salmon, Atlantic halibut, Atlantic cod, Rainbow trout and Haddock Location: Annapolis Basin, Digby County

We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca From: Paton, Andrew <Andrew.Paton@novascotia.ca>
Sent: March 22, 2018 11:40 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Amendment Notification - AQ#1039 - Annapolis Basin, Digby

Lynn

Thank you for keeping me in the loop on this.

Regards Andrew Paton



Andrew Paton, MCIP Senior Planner

APPENDIX I – NOVA SCOTIA DEPARTMENT OF COMMUNITIES, CULTURE AND HERITAGE

From: Winfield, Lynn
Sent: Tuesday, March 20, 2018 2:38 PM
To: Cottreau-Robins, Catherine M <<u>Catherine.Cottreau-Robins@novascotia.ca</u>>
Subject: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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1039 Amendment -CCH Memo & Maps.



novascotia.ca

MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

Be advised that Kelly Cove Salmon Ltd. has submitted an amendment to an existing aquaculture licence and lease (AQ#1039) to change the boundaries and increase the size. The site is located in Annapolis Basin (Rattling Beach), Digby County

Please find attached information relating to the following aquaculture amendment application:

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We request that you review and submit all components that pertain to this application by **May 22, 2018**. **Note:** We require a written (mail/email) response from each of our review agencies in order to process this application.

You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Nova Scotia Department of Communities, Culture and Heritage. From: Winfield, Lynn
Sent: March 20, 2018 2:46 PM
To: Cottreau-Robins, Catherine M <Catherine.Cottreau-Robins@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Qynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

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From: Winfield, Lynn
Sent: May 3, 2018 10:41 AM
To: Cottreau-Robins, Catherine M <Catherine.Cottreau-Robins@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Cottreau-Robins, Catherine M <Catherine.Cottreau-Robins@novascotia.ca>
Sent: May 23, 2018 12:35 PM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Cc: Weseloh McKeane, Sean <Sean.WeselohMcKeane@novascotia.ca>
Subject: RE: 1039 Boundary Amendment - Annapolis Basin, Digby County

Hi Lynn,

I have reviewed the proposed amendment to #1039 in Digby County. I do not have any archaeological concerns at this time. This is an expansion of an existing lease area and this is a cage-based operation with impacts from anchors only. If the license holders/operators encounter any archaeological resources in the course of their work at this aquaculture site, please have them contact the Special Places Program of the Nova Scotia Museum.

Yours, Katie Cottreau-Robins

APPENDIX J – NOVA SCOTIA DEPARTMENT OF LANDS AND FORESTRY (FORMERLY NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES) From: Winfield, Lynn
Sent: March 20, 2018 2:40 PM
To: Cameron, Heather <Heather.Cameron@novascotia.ca>
Subject: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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J.⊨ ₽Æ

1039 Amendment -NS DNR Memo & Mi



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MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

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You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Nova Scotia Department of Lands and Forestry (formerly Nova Scotia Department of Natural Resources). From: Winfield, Lynn
Sent: March 20, 2018 2:46 PM
To: Cameron, Heather <Heather.Cameron@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

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- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
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- □ Request additional information (described below)
- \Box No comments on the application

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From: Winfield, Lynn
Sent: May 3, 2018 10:41 AM
To: Cameron, Heather <Heather.Cameron@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: Cameron, Heather <Heather.Cameron@novascotia.ca>
Sent: May 15, 2018 10:26 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Good morning Lynn, Please find attached the comments from DNR for Boundary Amendment 1039. Thank you, ~Heather



Agency	NS Department of Natural Resources (DNR)
Division (if applicable)	
Reviewer	Heather Cameron consolidated comments into this single
	response from DNR.
Title of Reviewer	Policy Analyst
Date	May 15, 2018
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Network Agency Review of an Aquaculture Application

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- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- $\hfill\square$ No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Please see page 3 of this document for comments from DNR.

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The Department of Natural Resources (DNR) has been requested to review the request for an Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County. DNR provides the following comments:

Crown Lands –

According to the records on file at the Crown Land Information Management Centre, any land lying below the original ordinary high water mark of Annapolis Basin, at the location provided, is considered ungranted Crown land with no encumbrances.

It should be noted that the scope of our research only incudes comments on any NS Department of Natural Resources land ownership of the site and anything affecting that interest.

Geoscience and Mines –

There are currently no Mineral Exploration Licences, or Petroleum Agreements within a twomile radius of this site (1039) as at today's date Thursday, May 10, 2018. This does not mean that Licence or Agreement status will not change in the future.

Renewable Resources – No comments from Parks.

Regional Services, Western Region -

The proposed expansion lies within DNR designated Significant Habitat for overwintering wildfowl. The limited extent of this development should not impact the biodiversity interests of the Significant Habitat area. (Western Region Biologist)

APPENDIX K – NOVA SCOTIA DEPARTMENT OF FISHERIES AND AQUACULTURE – INLAND FISHERIES

From: Winfield, Lynn
Sent: March 20, 2018 2:39 PM
To: Murrant, Darryl D <Darryl.Murrant@novascotia.ca>
Subject: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attn: Network Review Agencies:

Please see attached Aquaculture Boundary Amendment Application No. 1039, in Annapolis Basin, Digby County.

Please respond with your feedback by May 22, 2018.

Thanks,

Qynn

E. Lynn Winfteld

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



1575 Lake Road Shelburne, NS BOT 1W0 Phone: 902-875-7440 Fax: 902-875-7429 Email: Lynn.Winfield@novascotia.ca

NS Department of Fisheries & Aquaculture Website

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MEMORANDUM

To: Aquaculture Network Agencies

- **From:** Lynn Winfield, Licensing Coordinator, Aquaculture Division Nova Scotia Department of Fisheries and Aquaculture
- CC: GIS Analyst Matthew King Manager of Aquaculture Development – Nathaniel Feindel Coastal Resource Coordinator – Joe Hanrahan
- **Date:** March 20, 2018

Re: Aquaculture Amendment Application No. 1039 – Digby County Aquaculture Network Review

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You may contact me at the number/email below if you have any questions.

Sincerely,

Lynn

E. Lynn Winfield, Licensing Coordinator NS Department of Fisheries and Aquaculture Tel: 902-875-7440 / Fax: 902-875-7429 E-Mail: Lynn.Winfield@novascotia.ca *Please refer to Application Package AQ#1039, Section 2.0 - Applicant's Aquaculture Development Plan, for documents sent to and reviewed by Nova Scotia Department of Fisheries and Aquaculture – Inland Fisheries. From: Winfield, Lynn
Sent: March 20, 2018 2:46 PM
To: Murrant, Darryl D <Darryl.Murrant@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Good afternoon,

Attached please find the Network Agency Review Form that was omitted from my previous email.

Thanks,

Qynn

E. Lynn Winfield

Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture



Network Agency Review of an Aquaculture Application

Agency	
Division (if applicable)	
Reviewer	
Title of Reviewer	
Date	
File No.	1039
Type of application	Boundary Amendment
Information Provided	

Please provide comments, concerns, recommendations, or requirements on the above stated application for a marine aquaculture licence. Please include the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. Similarly, if additional information is required to make a determination, please include the criterion /criteria within your jurisdiction or mandate that your request is based upon.

- $\hfill\square$ No concerns regarding the proposed development
- $\hfill\square$ Concerns with development are expressed below
- □ Request modifications to the proposed development (described below)
- □ Required or recommended conditions (described below)
- □ Request additional information (described below)
- \Box No comments on the application

Comments, concerns, recommendations, and/or required conditions including the criterion /criteria within your jurisdiction or mandate that your feedback is based upon. (Attach comments if preferred, or add additional pages, as required.):

Public Notice and Disclosure

As part of the process for deciding on an application, it may be necessary for the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") to disclose the collected network review information to the applicant and other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application in question.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture will disclose aquaculture application information, including network review information, on the departmental website.

Privacy Statement

The network review information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

From: Winfield, Lynn
Sent: May 3, 2018 10:41 AM
To: Murrant, Darryl D <Darryl.Murrant@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Attention: Network Review Agencies:

Please be reminded that our office has not received comments from your Department for Aquaculture Boundary Amendment Application No. 1039 in Annapolis Basin, Digby County.

Your comments are due on or before May 22, 2018.

Thanks,

Lynn

E. Lynn Winfield Licensing Coordinator,

Nova Scotia Department of Fisheries and Aquaculture

From: Murrant, Darryl D <Darryl.Murrant@novascotia.ca>
Sent: August 16, 2018 11:09 AM
To: Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Hi Lynn

Sorry I must have missed this one. As this is in the marine environment, I don't see any concerns from an Inland Fisheries perspective but will forward to Jason Leblanc for his comments as well.

Darryl

From: "Winfield, Lynn" <<u>Lynn.Winfield@novascotia.ca</u>> Date: January 24, 2020 at 3:57:43 PM AST To: "Murrant, Darryl D" <<u>Darryl.Murrant@novascotia.ca</u>> Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Hi Darryl,

Just working on this file today and wondered if Jason has any additional comments to add to your response? I have not had any response from Jason.

Thanks,

Qynn E. Lynn Winfield

Licensing Coordinator,

Nova Scotia Department of Fisheries and Aquaculture

On Jan 24, 2020, at 7:41 PM, Murrant, Darryl D <<u>Darryl.Murrant@novascotia.ca</u>> wrote: Hi Jason

Not sure if I sent this on to you or not. If you get a minute can you take a look and get back to Lynn.

Thanks

Darryl Sent from my iPhone

Begin forwarded message:

From: "Winfield, Lynn" <<u>Lynn.Winfield@novascotia.ca</u>> Date: January 24, 2020 at 3:57:43 PM AST To: "Murrant, Darryl D" <<u>Darryl.Murrant@novascotia.ca</u>> Subject: RE: Boundary Amendment - 1039 Annapolis Basin, Digby County

Hi Darryl,

Just working on this file today and wondered if Jason has any additional comments to add to your response? I have not had any response from Jason.

Thanks,

Qynn

E. Lynn Winfield Licensing Coordinator, Nova Scotia Department of Fisheries and Aquaculture

From: LeBlanc, Jason E <Jason.LeBlanc@novascotia.ca>
Sent: January 27, 2020 8:38 AM
To: Murrant, Darryl D <Darryl.Murrant@novascotia.ca>; Winfield, Lynn <Lynn.Winfield@novascotia.ca>
Subject: Re: Boundary Amendment - 1039 Annapolis Basin, Digby County

Hi Lynn

I have nothing to add.

Thanks Jason

Sent from my iPhone