EXHIBIT 59

NSARB 2023-003 AFF-002

RECEIVED ON FEBRUARY 20, 2024

NSARB-2023-001

Nova Scotia Aquaculture Review Board

IN THE MATTER OF: Applications made by KELLY COVE SALMON LTD. for a BOUNDARY AMENDMENT and TWO NEW MARINE FINFISH AQUACULTURE LICENSES and LEASES for the cultivation of ALTANTIC SALMON (*Salmo salar*) – AQ#1205x, AQ#1432, AQ#1433 in LIVERPOOL BAY, QUEENS COUNTY.

Affidavit of Inka Milewski

I affirm and give evidence as follows:

1. I am a marine biologist and a proposed expert witness in this matter at the request of Jamie Simpson, counsel for the intervenor Group of 22 Fishermen of Liverpool Bay.

2. I have personal knowledge of the evidence affirmed in this affidavit except where otherwise stated to be based on information and belief.

3. I state, in this affidavit, the source of any information that is not based on my own personal knowledge, and I state my belief of the source.

4. At the request of Jamie Simpson I reviewed and prepared a report on the evidence submitted by Shawn Robinson and by Christopher McKindsey. This report is attached as Exhibit "A".

5. This affidavit and the information provided in Exhibit "A" is provided to the Board as my objective, expert information and opinion for the assistance of the Board.

6. I am willing to testify in front of the Board at the hearing of this matter and comply with the directions of the Board as and if requested.

7. In all aspects in respect of this matter I act as an independent expert. I will inform each party of any change in my information on this matter or any new material fact that comes to my attention as soon as possible after a change in my information or my becoming aware of the new fact.

Affirmed before me by video link)
from Miramichi, New Brunswick)
to Halifax, Nova Scotia on)
[redacted])

[redacted]

Inka Milewski

JAMES I. SIMPSON
A Barrister of the Supreme Court of Nova Scotia

This is Exhibit "A" referred to in the affidavit of Inka Milewski

Sworn/affirmed before me on this 12 day of Feb, 2024.

[redacted]

JAMES I. SIMPSON
A Barrister of the Supreme Court of Nova Scotia

Review of the sworn affidavits of S. Robinson
and
C. McKindsey (Exhibit 56; NSARB-2023-001-AFF-007)
for the proposed aquaculture expansion and new leases in Liverpool Bay (NSARB-2023-001)

Prepared by
Inka Milewski
Department of Biology
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February 12, 2024

Preamble:

I have had an opportunity to review the affidavits sworn by S. Robinson and C. McKindsey (Exhibit 56; NSARB-2023-001-AFF-007) regarding lobster/farm interactions for the proposed aquaculture expansion and new leases in Liverpool Bay (NSARB-2023-001). For my review, I also accessed and reviewed relevant peer-reviewed scientific publications.

The Robinson affidavit addressed the effects of the proposed Kelly Cove Salmon Ltd expansion in Liverpool Bay on the local lobster population. The McKindsey affidavit included a draft manuscript co-authored by McKindsey, S. Robinson and others presenting the preliminary results of a three-year telemetry study using lobster and rock crabs in Liverpool Bay and for one year (2019) in Port Mouton.

The key findings from my review of both affidavits are:

- **Lobster abundance around the existing Coffin Island fish farm showed a "marked decreased" around the fish farm from the fallow period to the second year of fish production.**
- **The Liverpool Bay telemetry studies did not examine the impacts of the fish farm on lobster catches which is more relevant to assessing the impacts of the fish farm on the local lobster fishery.**
- **The Liverpool Bay telemetry studies did not discuss or present possible reasons for the decline of lobster abundance around the Coffin Island fish farm as fish farm biomass increased over the production period.**
- **Both affidavits misrepresented the purpose of the Loucks et al. (2014) and Milewski et al. 2018 studies which creates an impression that these studies were similar or comparable to the telemetry study and the Grant et al. 2019 study. The telemetry study in Liverpool Bay was an examination of the distribution and abundance of lobsters around a fish and not an examination of fish farm impacts on the lobster fishery as in the Loucks et al. (2014) and Milewski et al. 2018 studies.**
- **The microbiome study results reported by Robinson stated they "*could not detect any effect*" on the overall condition of the lobster from the fish farm site. However, the microbiome study in Liverpool Bay did not evaluate any effects on lobster condition/fitness (e.g., energy metabolism, body size) or physiology (e.g., reproduction, spawning, moulting, immunity).**

The following detailed review addresses first the Robinson affidavit and is followed by a review of the McKindsey affidavit.

Review of the affidavit sworn by S. Robinson

The Robinson affidavit addressed the effects of the proposed Kelly Cove Salmon Ltd expansion in Liverpool Bay on the local lobster population by discussing: 1) Grant et al. (2019) and Milewski et al. (2018) studies; 2) a lobster telemetry study in Liverpool Bay; and 3) a lobster and environmental microbiome study in Liverpool Bay. My review addresses these three areas.

1) **Comments in response to the discussion on Grant et al. (2019) and Milewski et al. (2018) studies**

Page 5 of Robinson Submission, para 12: "*The conclusions of this study* [Grant et al. 2019] *were that there were no detectable interactions between the salmon farm and the local lobster populations or the associated fishery.*"

Comment: This statement is not accurate nor a complete reflection of the conclusions made in Grant et al. (2019).

The abstract from Grant et al. (2019) concluded:

> "*Combining data from all lobster surveys (farm and reference sites) indicated an increase over 8 years, similar in slope to the increase of the trap fishery in Lobster Fishing Area (LFA) 38. These results indicate that the fish farm had no obvious impact on lobster density* [my emphasis] *at any point in the salmon production cycle and that inshore lobster abundance followed trends similar to those of the general fishery of LFA 38.*"

Grant et al. (2019) were correct to refer to the results of their dive survey as measuring lobster density and correct to refer to similarity in trends in abundance. Grant et al. (2019) did not say there were "no detectable interactions" between the salmon farm and the associated fishery because their study did not collect fisheries data. Grant et al. (2019) stated:

> "*Despite the difference in data sources, LFA 38 and Cheney Head* [location of the fish farm] *show a similar temporal trend* [my emphasis], *suggesting that over this multiyear time series, inshore lobsters reflect the abundance* [my emphasis] *of the regional (LFA 38) populations.*"

While temporal trends in lobster density/abundance can be explored using dive surveys and catch per unit of effort (CPUE), the Milewski et al. (2018) study did not explore density/abundance or temporal trends but rather catchability in relations to fish farm production periods by using CPUE data.

Furthermore, the environmental conditions at the Port Mouton farm site were different (e.g., mud bottom, depositional environment, environmental monitoring data in the hypoxic/anoxic range) than those identified in the Grant et al. 2019 study site (Grand Manan, New Brunswick).

The Milewski et al. (2018) and Grant et al. (2019) studies on lobster/aquaculture interactions were fundamentally two different studies in two different environmental settings that used two different measures (density vs fishing effort) to examine two different lobster/aquaculture interactions (density vs catch) which resulted in two different and unrelated conclusions.

Page 6 of Robinson Submission, para 13. *"Both of these studies were based on catch-per-unit-effort (CPUE) approaches, one with lobster traps and the other visually with divers."*

Comment: It is inaccurate to state that counting lobsters via SCUBA is similar to CPUE data. While both are survey methods, these methods collect different types of data.

Counting lobster along a transect with SCUBA measures density or the number of lobsters per a given area. Lobster trap catch data (CPUE) is a measure of fishing effort. Both methods generated data on density/abundance but CPUE data measures abundance through a particular gear, with certain size selectivity. Lobster traps do not attract and retain all sizes and sexes of the population equally and catch rates are affected by many factors (e.g., moult stage, reproductive cycles, bait odour plume, habitat, season, lunar and diurnal cycles, temperature, and water motion) (Watson and Jury 2013; Tremblay et al. 2006; Tremblay and Smith 2001, Miller 1990).

Lobster CPUE data gives a less accurate estimate of abundance than SCUBA surveys, but a more accurate picture of fishery impacts which is more relevant when assessing the impacts of fish farms on the lobster fishery.

2. Comments on the lobster telemetry study in Liverpool Bay.

Page 8 of Robinson Submission, para 17. *"The lobster movement results from this study* [Liverpool Bay] *were consistent with the* ***previous studies in New Brunswick*** [my emphasis] *which demonstrated that lobsters were very mobile and would move in and around the Coffin Island salmon farming site during their movements around Liverpool Bay with no obvious aversion to the farm."*

Comment: The reference to "previous studies in New Brunswick" is not supported by any publications. While the telemetry studies described in both the Robinson and McKindsey affidavits show that lobster move around fish farms, the claim by Robinson that lobster show no "obvious aversion" to fish farms appears to contradict observations attributed to Robinson in two published studies: Sardenne et al. (2020); and Horricks et al. (2022). The Sardenne et al. (2020) publication states:

> *"In general, telemetry studies of decapods movement around salmon farm sites in the study area* [Grand Manan, New Brunswick] *show that crabs are more likely than lobsters to stay associated with farm sites (McKindsey, Robinson, and Simard, unpublished data)."*

The Horricks et al. (2022) publication states:

> *"Preliminary data from telemetry studies have reported that lobsters spend less time near salmonid aquaculture sites in New Brunswick compared to rock crabs (Simard et al. 2018)* [not a publication but an abstract of a presentation made at a conference]*, which may be the cause for*

relatively unaltered lobster fatty acid profiles based on diet comparisons (S. Robinson, DFO, personal communication)."

Page 9, of Robinson Submission, para 19. *"My conclusions from the telemetered tagging studies* [in Liverpool Bay] *were that lobsters were not actively repelled by salmon farms as suggested by previous studies and that lobsters likely use the areas for foraging, possibly on the crabs that seem to actively inhabit the area, although the use by tagged lobsters appeared to decline as production on the farm grows."*

Comment: The first part of this statement regarding lobsters not being "repelled by salmon farms" contradicts information presented in the C. McKindsey affidavit (Exhibit 56; NSARB-2023-001-AFF-007). The McKindsey affidavit includes a draft manuscript presenting the preliminary results of the telemetry study in Liverpool Bay co-authored by C. McKindsey, S. Robinson and others. The manuscript states:

> *"There is a noted decrease in occupation of the* [Coffin Island, Liverpool Bay] *farm site by lobsters over time whereas this effect is not evident for rock crabs."* McKindsey affidavit: page 21 of 54, lines 248-249.
>
> *"In general terms, Atlantic salmon aquaculture in Liverpool Bay was observed to affect the abundance and movement of both American lobster and rock crabs."* McKindsey affidavit: Page 31 Of 54, line 333-335.

The second part of Robinson's statement regarding the "decline of lobsters as production grows" is however supported by the McKindsey affidavit.

> *"The present study noted a marked decrease in the abundance of lobster from the fallow year relative to the year when the farm contained two-year-old fish, although this trend was not observed in reference areas (Fralick Cove* [proposed Brooklyn site] *and Mersey Point)".* McKindsey affidavit: page 32 of 54, lines 366-268).

The draft manuscript in the McKindsey affidavit does not discuss or present a possible explanation, reason, or hypothesis for the decline of lobster abundance as fish on the farm grow. It is well-documented that lobster movement and behaviour is strongly mediated by temperature and olfaction (see review in Milewski et al. 2021). Lobsters are able to detect and respond to odour stimuli in concentration measured in parts per million (Atema and Voigt 1995). As one longstanding and leading scientist on the chemosensory world of lobster has stated:

> *"A half-century ago, lobsters gained prominence in the biological analysis of underwater chemical sensing, using neurobiological, behavioral, and ecological approaches. Lobsters made us recognize different chemical sensing organs, each with their unique signal filtering properties and behavioral functions, and they showed how they generate and control "information currents" for both odor dispersal and reception..... Lobsters remain significant contributors to underwater sensory biology, influencing many other model systems, including other crustaceans, mollusks, sharks, and reef fish larvae."* Atema (2018), page 479.

The findings of the Loucks et al. (2014) and Milewski et al. (2018) studies, referred to in the Robinson and McKindsey affidavits, did not suggest that lobsters were "repelled" by fish farms. Rather, their studies referred to the chemosensitivity of lobsters and hypothesize that odour plumes associated with changes to environmental quality via organic loading in the vicinity of fish farms could affect their behaviour (e.g., movement/distribution) and catchability.

Based on the results of the Liverpool lobster telemetry study, something is affecting the behaviour and distribution of lobster, specifically at the existing Coffin Island farm site. The telemetry studies were done after the lobster fishing season. An important next research step would be to examine what impact this change in abundance and movement would have on lobster catches in Liverpool Bay during the lobster fishing season. In addition, it would be important to understand why lobsters are moving away from the farm as fish biomass production increases. The telemetry study in Liverpool Bay does not offer any explanation for this behaviour. Lobster movement and behaviour is strongly mediated by olfaction and fishers (Wiber et al. 2012) and researchers (Black et al. 1996; Holmer et al. 2005) have reported "sewage" or hydrogen sulphide odours emanating from waters and sediments in the vicinity of fish farms. Virtually nothing is known about the odour seascape around farms and no studies at fish farms have modelled the areal extent or horizontal transport of dissolved sulphides and ammonium along the benthic boundary layer (5–10 cm above the sediments), where lobster and other mobile benthic organisms live (Milewski et al. 2018). Fish farms are also point sources of fine and coarse particulate matter (uneaten feed pellets, faeces, metabolic products), which can combine with natural fine-grained sediment to form loosely packed aggregates of particulate material called floc (Milligan and Law 2005). This material can settle and become part of a loose and mobile near-bottom turbid layer sometimes referred to as a nepheloid layer (Belias et al. 2007). Increased turbidity is believed to affect lobster catches (Drinkwater et al. 2006; Lewis et al. 2009). To my knowledge, no studies have been done to assess lobster behaviour or catch rates in turbid conditions around sea-cage finfish farms. This gap in knowledge represents another important area for future research.

Page 9, of Robinson Submission, para 20. *"The successful foraging of lobsters on food derived from salmon farms was supported by a study in Grand Manan, New Brunswick that looked at the biochemical composition of the crabs and lobsters captured under the farm[35]. That study utilized fats only found in salmon feed as a tracer to show that the lobsters and crabs were obtaining some of the nutrients from the fish food, either from direct feeding or secondarily from other prey species."*

Comment: This statement is in reference to a study by Sardenne et al. (2020) and implies that lobsters were successfully foraging on food derived from salmon farms (e.g., feed pellets). This is an inaccurate representation of the conclusions of that study. The Sardenne et al. (2020) study did not assess whether lobsters were feeding directly on salmon pellets or indirectly on prey species like crabs or other species associated with fish farms (e.g., sea urchins, polychaetes).

The Sardenne et al. (2020) publication states:

> "*This consumption is associated with a reduction in diet diversity and a trend of increased lipid content in rock crab, suggesting that this species* [rock crab] *is more receptive to the waste feed than the American lobster,* ***which did not show evidence of diet diversity loss and of increased lipid content*** [my emphasis]. *Fatty acid profiles from rock crab ovaries were also affected by the*

diet shift toward waste feed (low proportion of long-chain essential fatty acids), suggesting a potential influence on crab reproductive success. However, this remains to be assessed."

3) Comments on the microbiome study in Liverpool Bay

Page 11, of Robinson Submission, para 27. *"Most importantly, there were no significant differences in the gut microbiomes found in the lobsters from the reference areas and the lobsters from the farm site (Fig. 5) even though the microbiome of the sediment in the Coffin Island salmon farm was different than the ones in Mersey Point of Fralick Cove (Brooklyn) (not shown). These results do not mean that there were no effects on the overall condition of the lobsters from the farm site, but based on the microbiome biodiversity approach with the study of lobster stomachs, we could not detect any effect."*

Comment: This statement suggests or infers there should be a link between the gut microbiome of lobsters and the bacterial community in the sediment at the fish farm and reference sites (Mersey Point and Brooklyn sites). There is no evidence presented to support the idea that gut microbiome in lobsters is linked to the bacteria in the physical environment of lobsters. In fact, a laboratory study by Meziti et al. (2012, p 473) examined the impact of different diets (salmon feed, mussels, starvation) on the gut microbiome of reared Norway lobster (*Nephrops norvegicus*) and found that *"most gut bacteria were not related to the water or diet bacteria"* and suggested factors other than the physical environment affect gut microbiome.

In addition, no explanation is provided as to why the bacterial community in the sediment at the Coffin Island salmon farm was different than in the sediment at the proposed new farms sites (Mersey Point, Brooklyn). It is widely known that the benthic bacterial community changes as organic loading takes place under fish farms and bacterial DNA is increasingly being used to detect how far waste from salmon farms can be detected (Turon et al. 2022; He et al. 2021; Stoeck et al. 2018). A recent review paper examining the global trends in benthic bacterial diversity using DNA and community composition along organic enrichment gradients at salmon farms, with Robinson was one of the co-authors, concluded:

> *"Based on this finding, we can conclude that with increasing aquaculture impact, the benthic ecosystem is increasingly disturbed"* (Frühe et al 2021).

The Robinson study did not measure any "effect on the overall condition" of lobsters. The study simply looked at the bacterial community composition of lobster gut and the bacterial community composition of sediment. The study did not examine the relationship between gut bacteria in sediment and some type of physiological change or "condition" in lobster (e.g., reproduction, spawning, digestion, immunity).

Page 12 of Robinson Submission, para 28. *"Overall, the tagging and the microbiome studies from the Liverpool area show that there are very few detectable negative effects of the farm on the local lobster populations. Lobsters will freely range under and around fish farms and will actively consume some of the nutrients coming from them. This consumption of food items does not seem to be reflected in the microbiome of the lobster stomachs and therefore, there is no observable signal that the gut physiology of the lobsters is being affected."*

Comment: The tagging study in Liverpool Bay has in fact shown that, as production on the fish farm increases, lobster abundance and movement decreased (see comments in section 2 above). Given these results and the fact that lobster fishing takes place during high production periods, the next research step would be to examine what impact changes in abundance and movement would have on lobster catches.

The microbiome results presented by Robinson have not established that: 1) lobster are feeding on salmon pellets; and 2) there is a link between the bacteria in salmon pellets and bacteria in lobster gut. The fact that lobster gut microbiome shows no difference at the farm site or at the proposed new farm sites suggest that there is no link between the bacterial community in the benthic environment. Furthermore, the Sardenne et al. (2020) study suggests that lobsters are not likely or less likely to feed on salmon pellets.

Despite suggestions that DNA could be used for assessing overall lobster condition/fitness, physiological change, or effects on gut physiology, the study did not use any of these measures to detect "negative effects" between the Liverpool fish farm and lobsters or crabs. Simply showing that the bacterial community in lobster gut is different than the sediment bacterial community is not a measure of "condition", fitness, or effects on gut physiology. Feeding salmon pellets to lobster and crab and examining how their gut bacteria/microbiome responds would be one way of determining whether there is an effect from salmon waste (e.g., feed pellets) on the gut microbiome of lobster. This type of study was not done in Liverpool Bay.

The Robinson microbiome study is a point-in-time examination of a subset of bacteria found in the gut microbiomes of lobsters and crabs and bacteria in the benthic environment around Liverpool Bay. The results have only established that lobster and crabs have different gut bacterial communities and both lobster and crab have different gut bacterial communities than the benthic sediment environment at the Coffin Island fish farm.

Review of the affidavit sworn by C. McKindsey (Exhibit 56; NSARB-2023-001-AFF-007)

The McKindsey affidavit includes a draft manuscript presenting the preliminary results of a telemetry study using lobster and rock crabs and performed over three years (2019-2022) in Liverpool Bay and one year (2019) in Port Mouton. The Liverpool Bay study was done at the existing Coffin Island farm site and covered a full production cycle, starting with a fallow year (no fish on site) and subsequently at different production stages (fallow, 1-year old fish and 2-year old fish prior to harvesting). In the case of Port Mouton, the single study was done in June 2019, after the fishing season and three years after production at the farm site ceased. The draft manuscript identifies C. McKindsey as a co-author along with S. Robinson and others.

The following statements appear in the manuscript submitted in the McKinsey affidavit:

page 21 of 54, lines 248-249. *"There is a noted decrease in occupation of the* [Coffin Island, Liverpool Bay] *farm site by lobsters over time whereas this effect is not evident for rock crabs."*

page 31 0f 54, line 333-335. *"In general terms, Atlantic salmon aquaculture in Liverpool Bay was observed to affect the abundance and movement of both American lobster and rock crabs."*

page 32 of 54, lines 366-268. *"The present study noted a marked decrease in the abundance of lobster from the fallow year relative to the year when the farm contained two-year-old fish, although this trend was not observed in reference areas (Fralick Cove* [proposed Brooklyn site] *and Mersey Point)."*

Comment: The results of the McKindsey et al. tagging study in Liverpool Bay have shown that, as production on the fish farm increases, lobster abundance and movement decreased. The draft manuscript in the McKindsey affidavit does not discuss or present a possible explanation, reason, or hypothesis for the decline of lobster abundance as fish on the farm grow. It is well-documented that lobster movement and behaviour is strongly mediated by temperature and olfaction (see review in Milewski et al. 2021). Neither of these factors were examined in the study. Given these results and the fact that lobster fishing takes place during high production periods, the next research step would be to examine what changes in abundance and movement would have on lobster catches.

Page 9 of 54, lines 58-58. *"Previous work done around the Port Mouton Atlantic salmon/rainbow trout farm suggested it impacts the distribution of market and berried lobster (Loucks et al. 2014; Milewski et al. 2018), making it of interest in the present study."*

Comment: This statement mischaracterizes the studies done in Port Mouton. The Port Mouton studies did not examine the distribution of market and berried lobsters but rather catch rates. This fact is reflected in the title of both peer-review publications.

Loucks, R.H., Smith, R.E., and Fisher, E.B. 2014. Interactions between finfish aquaculture and lobster catches in a sheltered bay. *Marine Pollution Bulletin* 88: 255–259.

Milewski, I., Loucks, R.H., Fisher, B., Smith, R.E., McCain, J.S.P., Lotze, H.K., 2018. Sea-cage aquaculture impacts market and berried lobster (*Homarus americanus*) catches. *Marine Ecology Progress Series* 598: 85-97.

Page 32 of 54, lines 370-374. *"However, Milewski et al. (2018) invoke mechanisms occurring at a larger spatial scale (e.g. hypoxia and sulphide levels, as outlined in Hargrave et al. 1997, for example) than patterns observed in the present study* [my emphasis] *and the data to support predicted effects in Milewski et al. (2018) show the opposite pattern than would be predicted* [my emphasis] *(i.e. there were fewer berried lobster in the region surrounding the farm in fallow years than in years when fish were in cages)."*

Comment: The study done by McKindsey and colleagues in Port Mouton took place in June, after the fishing season and three years after the fish farm ceased operation. There is no basis for comparing or speculating on patterns of berried lobster movement or occurrence between the McKindsey study and the catch data presented in Milewski et al. (2018). The study done by McKindsey and colleagues did not examine lobster catches. Furthermore, their data analysis did not account for the differences in spatial and temporal scales and environmental conditions between the 2018 study and their study. The McKindsey study had only one year of data (compared to 11 years in the 2018 Port Mouton study), no temperature data (compared to 11 years of temperature data in 2018 Port Mouton study) and there was no fish production at the Port Mouton site for 3 years prior to the study presented by McKindsey.

Reference:

Atema, J., 2018. Opening the chemosensory world of the lobster, *Homarus americanus*. *Bulletin of Marine Science* 94: 479–516.

Atema, J., and Voigt, R. 1995. Behavior and sensory biology. *In* Biology of the Lobster *Homarus americanus*, pp. 313–348. Ed. by J.R. Factor. Academic Press, San Diego.

Belias C, Dassenakis M, Scoullos M. 2007. Study of the N, P and Si fluxes between fish farm sediment and seawater. Results of simulation experiments employing a benthic chamber under various redox conditions. *Marine Chemistry* 103: 266–275.

Black KD, Kiemer MCB, Ezzi IA. 1996. The relationships between hydrodynamics, the concentration of hydrogen sulphide produced by polluted sediments and fish health at several marine cage farms in Scotland and Ireland. *Journal of Applied Ichthyology* 12: 15–20.

Drinkwater KF, Tremblay MJ, Comeau M. 2006. The influence of wind and temperature on the catch rate of the American lobster (*Homarus americanus*) during spring fisheries off eastern Canada. *Fisheries Oceanography* 15: 150–165.

Frühe, L., Dully, V., Forster, D., Keeley, N.B., Laroche, O., Pochon, X., Robinson, S., Wilding, T.A. and Stoeck, T., 2021. Global trends of benthic bacterial diversity and community composition along organic enrichment gradients of salmon farms. *Frontiers in Microbiology, 12*, p.637811.

He, X., Gilmore, S.R., Sutherland, T.F., Hajibabaei, M., Miller, K.M., Westfall, K.M., Pawlowski, J. and Abbott, C.L., 2021. Biotic signals associated with benthic impacts of salmon farms [British Columbia] from eDNA metabarcoding of sediments. *Molecular Ecology*, *30*(13), pp.3158-3174.

Holmer M, Wildish D, Hargrave B (2005) Organic enrichment from marine finfish aquaculture and effects on sediment processes. In: Hargrave BT (ed) Environmental effects of marine finfish aquaculture, Vol 5M. Springer, Berlin, p 181–206.

Horricks, R.A., Lewis-McCrea, L.M. and Reid, G.K., 2022. Interactions between American lobster (*Homarus americanus*) and salmonid aquaculture in the Canadian Maritimes. *Canadian Journal of Fisheries and Aquatic Sciences 79*(9): 1561-1571.

Lewis CF, Slade SL, Maxwell KE, Mathews TR (2009) Lobster trap impact on coral reefs: effects of wind driven trap movement. *New Zealand Journal of Marine and Freshwater Research* 43: 271–282.

Loucks, R.H., Smith, R.E., and Fisher, E.B. 2014. Interactions between finfish aquaculture and lobster catches in a sheltered bay. *Marine Pollution Bulletin* 88: 255–259.

Meziti, A., Mente, E. and Kormas, K.A., 2012. Gut bacteria associated with different diets in reared *Nephrops norvegicus*. *Systematic and applied microbiology*, *35*(7), pp.473-482.

Milewski, I., Smith, R.E., and Lotze, H.K. 2021. Interactions between finfish aquaculture and American lobster in Atlantic Canada. *Ocean & Coastal Management* 210: 105664.

Milewski, I., Loucks, R.H., Fisher, B., Smith, R.E., McCain, J.S.P., Lotze, H.K., 2018. Sea-cage aquaculture impacts market and berried lobster (*Homarus americanus*) catches. *Marine Ecology Progress Series* 598: 85-97.

Miller, R.J., 1990. Effectiveness of crab and lobster traps. *Canadian Journal of Fisheries and Aquatic Sciences* 47: 1228–1251.

Milligan, T.G., and Law, B.A. 2005. The effect of marine aquaculture on fine sediment dynamics in coastal inlets. In: Hargrave BT (ed) Environmental effects of marine finfish aquaculture, Vol 5M. Springer, Berlin, p 239–251.

Tremblay, M. J., and Smith, S. J. 2001. Lobster (*Homarus americanus*) catchability in different habitats in late spring and early fall. *Marine and Freshwater Research* 52: 1321–1331.

Tremblay, J. M., S. J. Smith, D. A. Robichaud and P. Lawton. 2006. The catchability of large American lobsters (*Homarus americanus*) from diving and trapping studies off Grand Manan Island, Canadian Maritimes. Can. J. Fish. Aquat. Sci. 63:1925–1933

Turon, M., Nygaard, M., Guri, G., Wangensteen, O.S. and Præbel, K., 2022. Fine-scale differences in eukaryotic communities inside and outside salmon aquaculture cages [Norway] revealed by eDNA metabarcoding. *Frontiers in Genetics*, *13*, p.957251.

Sardenne, F., Simard, M., Robinson, S.M. and McKindsey, C.W., 2020. Consumption of organic wastes from coastal salmon aquaculture by wild decapods. *Science of The Total Environment*, *711*, p.134863.

Stoeck, T., Frühe, L., Forster, D., Cordier, T., Martins, C.I. and Pawlowski, J., 2018. Environmental DNA metabarcoding of benthic bacterial communities indicates the benthic footprint of salmon aquaculture [Norway]. *Marine Pollution Bulletin*, *127*, pp.139-149.

Watson, W. and Jury, S.H., 2013. The relationship between American lobster catch, entry rate into traps and density. *Marine Biology Research*, *9*(1), pp.59-68.

Wiber, M., Wilson, L., Young S. 2012. Impact of aquaculture on commercial fisheries: fishermen's local ecological knowledge. *Human Ecology* 40: 29–40