

Minister of
Fisheries and Oceans



Ministre des
Pêches et des Océans

Ottawa, Canada K1A 0E6

FEB 03 2012

Mr. Kevin Lynch
Mr. Michael Harris
Environmental Law Clinic
University of Denver Sturm College of Law
< klynch@law.du.edu >

Dear Mr. Lynch and Mr. Harris:

Thank you for your correspondence of December 29, 2011, regarding aquaculture in British Columbia.

I understand your concerns and assure you that Fisheries and Oceans Canada (DFO) takes its responsibility to safeguard the health of British Columbia's wild salmon very seriously. DFO is committed to the sustainability, conservation and protection of marine ecosystems and the aquatic species they support in British Columbia.

Since assuming responsibility for the licensing and regulation of finfish, shellfish and freshwater aquaculture operations, the Department has developed new *Fisheries Act* regulations for aquaculture in British Columbia. The *Pacific Aquaculture Regulations* provide a legal framework consistent with DFO's mandate to manage fisheries and protect wild fish and fish habitat. The Regulations set the foundation for explicit environmental management requirements, tailored to the specific characteristics of each proposed aquaculture site through licence conditions. These requirements include fish health management plans, escape prevention requirements, sea lice management, and mitigation of habitat impacts and environmental effects. More information, including reporting on the environmental and operational performance of the aquaculture industry in British Columbia, is available on the Department's website at < www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.htm >.

DFO has built on the experiences of the past and has carefully examined regulatory regimes for aquaculture management in other countries to identify best practices and lessons learned that are relevant to the situation in British Columbia. The Regulations are available online at < <http://canadagazette.gc.ca/rp-pr/p2/2010/2010-12-08/html/sor-dors270-eng.html> >.

.../2

Canada

You raise a number of specific concerns regarding the impacts of aquaculture on wild salmon stocks, including sea lice, disease transmission, pollution, escapes, *Fisheries Act* enforcement, and the use of SLICE®. Since each of these topics is complex, I have attached related appendices to address your concerns.

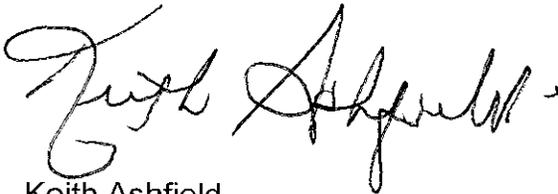
Regarding your comments about the applicability of habitat protection provisions of the *Fisheries Act* to aquaculture, the Marine Finfish Conditions of Licence for aquaculture operators under the *Pacific Aquaculture Regulations* have specific provisions to regulate the impacts to fish habitat, and require the development of compensatory habitat.

To discuss aquaculture matters in further detail, you may wish to contact Mr. Andrew Thomson, Director, Aquaculture Management Division, Pacific Region, by telephone at 604-666-3152, or by email at < andrew.thomson@dfo-mpo.gc.ca >.

The Government of Canada recognizes the cultural, ecological and economic importance of salmon in British Columbia. The Department will continue to work to conserve and protect salmon stocks for current and future generations.

Thank you for taking the time to share your concerns.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Keith Ashfield". The signature is written in a cursive, flowing style.

Keith Ashfield

Attachments (4)

SEA LICE

Management strategies

- Fish farms are required to create fish health management plans that include monitoring and managing the level of sea lice.
- The regulations allow Fisheries and Oceans Canada (DFO) to mandate fish farm operators to monitor the health of wild salmon near their aquaculture sites.
- Current sea lice management strategies include fallowing (modifying production cycles to minimize farmed fish presence during key periods), harvesting and preventative treatment of farms with emamectin benzoate (SLICE®).
- The current aquaculture management strategies were developed based on an extensive body of peer-reviewed science related to both local and international experience with sea lice, and are based on a sea lice trigger level of three motile lice per fish. These are similar to the previous provincial requirements; however, the Department's conditions of licence include more prescriptive actions should the trigger level be exceeded.

Research

- DFO prides itself on maintaining an objective science research program, focused on the Department's priority issues. Results of this research are peer-reviewed and published in international scientific journals. DFO scientists take into account all peer-reviewed science of which they are aware.
- DFO collaborated on the development of peer-reviewed literature on sea lice. A summary of this research is available at < www.llbc.leg.bc.ca/public/pubdocs/bcdocs/457386/sealouseupdate2009.pdf >.
- DFO has also conducted scientific studies on sea lice. DFO monitoring of wild juvenile pink and chum salmon in the Broughton area has found non-lethal sea lice levels on the juveniles in the last several years, particularly upon the most critical stage of ocean entry. Historic sea lice infection rates on juvenile pink and chum salmon in the Broughton Archipelago can be found at < www.pac.dfo-mpo.gc.ca/science/aquaculture/pinksalmon-saumonrose/results-resultats/index-eng.htm >.
- DFO has initiated a research program that will provide new data on sea lice levels on wild juvenile salmon in the Discovery Islands. The Department is also involved in collaborative programs to assess sea lice on wild juvenile salmon in the Broughton Archipelago and Nootka Sound. In addition, DFO is studying how sea lice may disperse along migration routes, and is conducting laboratory studies on the susceptibility of wild Pacific salmon to sea lice.

SLICE®

- The veterinary drug emamectin benzoate, commonly known as SLICE®, is administered in farmed fish feed to reduce the numbers of sea lice on farmed fish.
- SLICE® is administered under veterinary prescription and is approved by Health Canada for use in sea lice control in Canada.
- The Canadian Food Inspection Agency tests domestically produced and imported aquaculture products for a variety of drug residues, including SLICE®, to verify that these products do not exceed the residue limits set by Health Canada.
- Research conducted on the effects of SLICE® on prawn and crab species native to British Columbia shows no increased mortality of those non-target species. Published studies have demonstrated no evidence for toxicity in zooplankton and bivalve molluscs when exposed to levels of SLICE® that these animals encounter.
- DFO is conducting further studies on the effects of SLICE® in the marine environment. For more information about the use and safety of SLICE® in Canada, you may wish to write directly to Health Canada.
- The British Columbia Centre for Aquatic Health Sciences has begun to research how sea lice respond to SLICE® in a laboratory environment, which may assist in future studies of potential SLICE® resistance.

Drug resistance

- In other countries, and in eastern Canada, there have been cases of potential resistance to SLICE® in sea lice populations on farmed stock that may be a result of multiple treatments with the drug, many farms in an area, and limited numbers of wild sea lice (lack of new influx of wild lice gene flow).
- In British Columbia, SLICE® is used infrequently as compared to other salmon farming areas, usually less than twice per grow-out cycle, and there has been an overall decline in the use of this drug in British Columbia since 2005.
- To date, the British Columbia provincial government, which was the aquaculture management authority, has indicated that there is no evidence to suggest sea lice in Nootka Sound, or elsewhere in British Columbia, are resistant to SLICE®.
- If potential evidence of resistance occurs, alternative sea lice management strategies will be explored.
- For more information about sea lice management and monitoring, please visit < www.dfo-mpo.gc.ca/aquaculture/lice-pou-eng.htm >, or contact Mr. Mark Sheppard, DFO Aquaculture Management, by email at < Mark.Sheppard@dfo-mpo.gc.ca >, or by telephone at 250-703-0901.
- For more information regarding DFO's sea lice research, you may wish to contact Mr. Mark Saunders in DFO's Science Branch, by email at < Mark.Saunders@dfo-mpo.gc.ca >, or by telephone at 250-756-7145.
- For more information about sea lice biology, please visit < www.dfo-mpo.gc.ca/media/infocus-alaune/2005/20051011b/info-eng.htm >.

PREVENTING THE SPREAD OF FISH PATHOGENS

Strict measures are in place to prevent the spread of both identified and unidentified fish pathogens from other countries and other parts of Canada to British Columbia's fish farms. For aquaculture purposes, British Columbia has a strict importation policy of fertilized eggs only for all salmonid species.

Under DFO's *Policy for the Importation of Atlantic Salmon into British Columbia*, only surface-disinfected, fertilized Atlantic salmon eggs from sources certified by a local fish health officer (LFHO) are permitted for import into British Columbia. No live Atlantic salmon or unfertilized eggs are eligible for import.

Any facility serving as a source of eggs for import into British Columbia must undergo rigorous health testing under the *Fish Health Protection Regulations* before eggs can be provided to British Columbia culture operations.

This applies to facilities within Canada or abroad. To export to British Columbia, a facility must be compliant with Canadian laws and regulations.

Since the last import of eggs from Washington State in 2001, the only eggs that have been imported into British Columbia have come from a pathogen-free source in Iceland. This source is a dry-land, closed-containment facility.

Imports of fertilized eggs from qualifying facilities are held in strict quarantine and isolation for up to one year, and the resulting progeny undergo rigorous health testing before introduction to ocean farms. A condition of the import agreement is that results of the fish health testing must be reported to the LFHO on a monthly basis, while fish are in quarantine.

As well, the importing company must immediately contact and advise a LFHO if any of the diseases or disease agents of concern are discovered in the eggs or resulting progeny at any time. Fish are only released from quarantine if all screening reports are satisfactory.

Upon completion of the quarantine and isolation period, the Minister of Fisheries and Oceans issues licences for all introduction and transfers of fish pursuant to Section 56 of the *Fishery (General) Regulations* (FGR), and only issues licences to transfer fish in the absence of disease agents of concern that may be harmful to the protection and conservation of fish. Fish may only be transferred to sea cage pens with either a valid Section 56 FGR or Pacific Aquaculture licence.

Site, vessel and visitor-related fish health protocols (including the use of foot baths and disinfection of any equipment used with fish or sediment monitoring) are in place in accordance with the industry-wide Fish Health Management Plans in British Columbia.

HABITAT IMPACT MITIGATION

Monitoring and analysis of the benthic zone (seabed) have been requirements for aquaculture for many years and continue to be required under the *Pacific Aquaculture Regulations*. For new sites, monitoring of the seabed occurs before farms are operational, and siting criteria is in place to protect sensitive and critical species and habitats. Benthic monitoring also occurs during facility operations to ensure that environmental thresholds are not exceeded.

The waste that is likely to occur from aquaculture is organic waste made up of excess feed and fecal material that deposit on the seabed. The seabed is monitored to ensure the predicted waste footprint is within the area expected. This modelled information is used to site new aquaculture facilities in areas to avoid sensitive and critical fish habitat.

The issue of waste beneath pens is also being addressed by improving feed conversion ratios as a result of nutrition research, monitoring the feeding behaviour of the cultured salmon so that excess feed is not introduced into the pens, and fallowing for sea floor recovery should it be required.

The Department also conducts ongoing research into aquaculture environmental interactions for continued understanding of the potential effects as a basis for adaptive management.

ESCAPE PREVENTION

Aquaculture operators make escape prevention a priority, as escaped farm fish can be a significant economic loss to the individual fish farm operator. The *Pacific Aquaculture Regulations* licence conditions outline the measures that aquaculture operations must take to minimize the escape of fish from the aquaculture facility and to catch the fish that escape from an aquaculture facility.

Fisheries and Oceans Canada has been monitoring the impact of farmed Atlantic salmon on native stocks since 1991. Our research shows that farm-raised Atlantic salmon adapt poorly to feeding in the natural environment and have shown no detrimental effects on Pacific salmon. In addition, worldwide, Atlantic salmon have not been shown to be successful at establishing populations outside their endemic range even when purposely transplanted.