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15 October 2007

Dr. David Suzuki, Founder
The David Suzuki Foundation
Suite 219, 2211 West 4th Avenue
Vancouver, BC, Canada, V6K 4S2

Dr. Suzuki,

RE: Sea lice, salmon farming and wild salmon

Responding to your open letter of 18 September 2007 to Prime Minister Stephen Harper and Premier Gordon Campbell, I am writing this open letter as a concerned member of the public.

In my opinion, research findings were inaccurately presented and important information was not included in your letter to our Prime Minister and our Premier.

Your letter states, "in some cases, sea lice originating from salmon farms are estimated to have killed up to 95% of the wild juvenile salmon that pass salmon farms during their ocean migrations." In fact, the research by Krkosek and colleagues estimated that sea lice kill **9 - 95 %** of juvenile wild salmon¹. You mention only the upper limit of that range.

The Krkosek research, funded by the David Suzuki Foundation, claims that sea lice originated from salmon farms yet this research provides no proof that they did. According to the Association of Aquatic Veterinarians of B.C. (AAVBC), "without using isotopes or some other traceable signature, it is not possible to know whether the source of lice seen on the juveniles was from the farms or from a wild source."² Wild sticklebacks, herring and rockfish also carry sea lice.^{3,4} Furthermore, during part of the Krkosek research, the farm under study had no fish!^{5,6}

The AAVBC described the Krkosek research as "too simplistic in its approach and therefore potentially seriously misleading in its conclusions" and stated, "the conclusions of the article are too sweeping and not supported."

In their research paper, Alexandra Morton and Rick Routledge (who also signed your letter), state "this was not a controlled experiment," and "handling and containment likely had some effect on fish and sea lice survivorship" (read: mortality), and "we can not exclude the possibility that there is some systematic difference between fish that had more lice and fish that had fewer."⁷

Your letter said, "the science is clear" and "there are no scientific studies to the contrary."

In my opinion, three important points were not included in your letter:

- Juvenile pink salmon mortality is naturally very high. A pink salmon produces about 2,000 eggs of which two must spawn to sustain the population. Since the 1960s, long before salmon farming, studies found that 59 to 77 per cent of juvenile wild pink salmon die within the first 40 days in the marine environment.⁸
- Since 1987 salmon farming has been practiced in the Broughton Archipelago where wild pink salmon returns reached a record high in 2000.⁹ In 2004, marine survival of wild pink salmon also reached a record high estimated at 34%.¹⁰ This would not have occurred if "up to 95%" of the juveniles had been killed by sea lice.

- Wild pink salmon populations are known to fluctuate. In Alaska - where there are no salmon farms - the 2006 return of wild pink salmon was less than 10% of the average, the lowest pink return since 1975.^{11,12}

Sea lice publicity to shift consumer demand away from farmed salmon?

Having worked in the salmon farming industry during 2002 and 2003, I believe that under certain conditions and *if improperly managed*, sea lice may pose some risks to both wild and farmed salmon. When I spoke to the Special Committee on Sustainable Aquaculture of the Legislature of British Columbia on 24 November 2006, I referred to Alexandra Morton's work and urged the Committee to take it seriously. In fact, I asked whether sea lice might be the marine equivalent of the pine beetle or the mosquito.

When I spoke to the Special Committee, I was unaware that the Krkosek research had been publicized by SeaWeb while it was funded by the Gordon and Betty Moore Foundation for "integration of aquaculture science messages into an antifarming campaign," "identification of antifarming audiences and issues," "standardization of anti-farming messages", an "earned media campaign," and "co-ordination of media for antifarming ENGOs."¹³ As one of ten accomplishments listed for 2005, SeaWeb reports that it collaborated with Krkosek and colleagues to communicate their research internationally.¹⁴ SeaWeb has offices in the U.S., London and Paris.

On page 76 of its 2004 tax filing (990-PF)¹⁵, the Moore Foundation reports to the U.S. Internal Revenue Service that its \$560,000 grant to SeaWeb was "to provide a high quality tool kit and co-ordination infrastructure for use by environmental organizations in their campaigns to shift consumer and retailer demand away from farmed salmon."

I suppose that it would not be easy to shift consumer demand away from farmed salmon if one were to publicize that wild salmon mortality due to sea lice may be as low as 9 percent, that sea lice may be from wild sticklebacks, herring and rockfish, that the studies that have found high mortality were not controlled experiments, and have not been replicated.

I re-iterate the questions in my letter of 11 May 2007 about your apparent involvement in the funded marketing for Alaskan wild and ranched salmon, and the demarketing of farmed salmon:

1. Is sea lice research one of the "aquaculture science messages" of the "antifarming campaign," funded by the Moore Foundation? Is publicity of sea lice research part of the "earned media" to shift consumer demand away from farmed salmon?
2. Is the David Suzuki Foundation one of the environmental organizations that is working with the Alaska Seafood Marketing Institute?¹⁶

It seems to me that my questions of 11 May are fair and that your response is over-due.

Sincerely,

Vivian Krause

c.c. The Right Honourable Stephen Harper, The Prime Minister of Canada
The Honourable Gordon Campbell, The Premier of British Columbia

The Honourable Pat Bell, The Minister for Agriculture and Lands, British Columbia
 Mr. James Hoggan, Chair, The David Suzuki Foundation
 Mr. Martin Krkosek, Ph.D. Candidate, University of Alberta
 Dr. Mark Lewis, Professor, University of Alberta
 Dr. John Volpe, Assistant Professor, University of Victoria
 Mr. Tim Draimin, Executive Director, Tides Canada Foundation
 Ms. Alexandra Morton, Raincoast Research Society
 Ms. Dawn Martin, President, SeaWeb
 Dr. Ed Penhoet, President, The Gordon and Betty Moore Foundation
 Ms. Barbara Wright, General Counsel, The David & Lucille Packard Foundation
 Mr. William Hull, Acting Executive Director, The Consultative Group on Biological Diversity
 Mr. Richard Harry, Executive Director, Aboriginal Aquaculture Association
 Ms. Pamela Parker, Executive Director, B.C. Pacific Salmon Forum
 Ms. Mary Ellen Walling, Executive Director, B.C. Salmon Farmers Association
 Members of the former Special Committee on Sustainable Aquaculture
 Mayor Gerry Furney, Port McNeill, B.C.
 Ms. Kim Carter, Ombudsman of British Columbia

Sources:

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- ¹ Krkosek, M. M. A. Lewis, A. Morton, L.N. Frazer, and John P. Volpe. Epizootics of wild fish induced by farm fish. PNAS, 103(42), 15506-15510, 17 October 2006.
- ² http://www.al.gov.bc.ca/ahc/fish_health/Sealice/AAVBC_sealice_comments.pdf
- ³ Jones SRM, G Proserpi-Porta, E Kim, P Callow, NB Hargreaves. 2006. The occurrence of *Lepeophtheirus salmonis* and *Caligus clemensi* (Copepoda: Caligidae) on threespine stickleback *Gasterosteus aculeatus* in coastal British Columbia. J. Parasitol. 92: 473-480.
- ⁴ Jones SRM, W Wosniok W, NB Hargreaves. 2006. The salmon louse on salmonid and non-salmonid fishes in British Columbia. Proc. 11th ISVEE. 1131
- ⁵ Brooks 2005. The effects of water temperature, salinity, and currents on the survival and distribution of the infective copepodid stage of sea lice (*Lepeophtheirus Salmonis*) Originating on Atlantic Salmon Farms in the Broughton Archipelago of British Columbia. Reviews in Fisheries Science 13:177-204.
- ⁶ Brooks. 2006. A critical review of Krkosek et al. (2006) Epizootics of wild fish induced by farm fish. http://www.salmonfarmers.org/pdfs/critical_review_of_Krkosek.pdf
- ⁷ Morton, A., and R. Routledge. 2005. Mortality Rates for Juvenile Pink (*Oncorhynchus gorbuscha*) and Chum (*O. keta*) salmon infested with sea lice (*Lepeophtheirus salmonis*) in the Broughton Archipelago. Alaska Fisheries Research Bulletin 11(2): 146-152.
- ⁸ Parker, R.R. 1968. Marine mortality schedules of pink salmon of the Bella Coola river, central British Columbia. J. Fish. Res. Bd. Canada, 25(4) 757-794.
- ⁹ http://www-comm.pac.dfo-mpo.gc.ca/pages/release/p-releas/2002/nr070_e.htm
- ¹⁰ Beamish, R. J. Jones, S. Neville, C.E., Sweeting, R., Karreman, G. Saksida, S. and E. Gordon. 2006. Exceptional marine survival of pink salmon that entered the marine environment in 2003 suggests that farmed Atlantic salmon and Pacific salmon can coexist successfully in a marine ecosystem on the Pacific coast of Canada. ICES Journal of Marine Science 63(7) 1326-37.
- ¹¹ The Pacific Salmon Commission Northern Boundary Technical Committee Report. January 2007. U.S./Canada Northern Boundary Area 2006 Salmon Fisheries Management Report and 2007 Preliminary Expectations. Report TCNB (07)-1. <http://www.psc.org/pubs/TCNB07-1.pdf>
- ¹² Eggers, D. Run forecasts and harvest projections for 2007 Alaska salmon fisheries and review of the 2006 season. Special Publication No. 07-01. Alaska Department of Fish and Game. February 2007. <http://www.sf.adfg.state.ak.us/FedAidpdfs/sp07-01.pdf>
- ¹³ This is the stated purpose of the Moore Foundation's \$560,000 grant to SeaWeb as posted at the Moore Foundation's web-site in January 2007. In February or early March, the Moore Foundation changed the titles and stated purposes of at least four grants, including SeaWeb's.
- ¹⁴ <http://seaweb.org/aboutus/accomplishments.php>
- ¹⁵ http://moore.org/cms/uploadedFiles/2004%20Moore%20Fndn_990PF_complete.pdf. Page 76.
- ¹⁶ <http://www.ufa-fish.org/update/02/120602.htm>. Item #26, "Why ASMI doesn't bash farmed fish."