



PRESS RELEASE

27 September 2006

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Wild Salmon Mortality Caused By Fish Farms

Up to 95 per cent of wild juvenile salmon killed by parasites from salmon farms

Research just published has confirmed that sea lice from fish farms kill wild salmon. Sea lice are natural parasites of fish, but fish farms change the way wild salmon get infected. The result is up to 95 per cent of wild juvenile salmon are dying.

“We know that fish farms raise sea lice levels, and we know that sea lice kill fish,” said the study’s lead author Martin Krkosek, a Ph.D. student at the University of Alberta’s Centre for Mathematical Biology. “This is the first study to combine field surveys, experiments, and mathematical modeling in one system, to estimate the total impact of the farms.”

The primary sea lice hosts are adult salmon. Under natural conditions, the adults are far offshore when the juveniles are migrating out to sea. Fish farms put adult salmon in net pens along the migration routes. The result is a cloud of sea lice through which the juveniles must migrate. “It takes only one or two sea lice to kill a juvenile pink or chum salmon,” said Krkosek. “The juveniles are so vulnerable because they are so small – only one to two inches long.”

“We often worry about wildlife making humans sick, but here is a case where humans are making wildlife sick,” said study co-author Dr. Mark Lewis, a mathematician and biologist at the University of Alberta.

The study found an increasing number of salmon were killed over the migration season, from 9 per cent in early spring when the sea lice population was low to 95 percent in late spring when the sea lice population was higher.

“Everyone knows that only a small fraction of juvenile salmon survive to return as adults,” said Lewis. “The fish-farm sea lice are reducing that fraction even more.”

The research was conducted by a team of biologists and mathematicians working in coastal British Columbia. “We counted sea lice on more than 14 thousand juvenile salmon migrating past fish farms, and conducted mortality experiments with more than 3 thousand fish,” said Krkosek. “We then used mathematical models to combine this information and estimate the total impact of the farms.”

“The work is of an impeccably high standard, and will be very difficult to refute,” said Dr. Andy Dobson, an epidemiologist from Princeton University who specializes in wildlife diseases.

The study’s implications may be severe for wild salmon. “Even the best case scenario of an additional 10% mortality from farm-origin sea lice could push a fish stock into the red zone,” said biologist Dr. John Volpe, a study co-author at the University of Victoria.

Although the study was conducted in British Columbia, the results apply globally. “This study really raises the question of whether we can have native salmon and large scale aquaculture – as it is currently practiced – in the same place,” said Dr. Ransom Myers, a fisheries biologist at Dalhousie University. “It also raises a more distant specter,” said Dobson. “When are we going to see the first human disease caused by aquaculture?”

Background

The study will be published during the week October 2-6 in the peer-reviewed scientific journal, the *Proceedings of the National Academy of Sciences of The United States of America*.

The research was funded primarily by the National Research Council of Canada and the Natural Sciences and Engineering Research Council of Canada. Further support came from the David Suzuki Foundation, the Canadian Sablefish Association, and the British Columbia Wilderness Tourism Association.

“The analysis in this paper almost certainly underestimates the total mortality of juvenile salmon,” said study co-author Dr. Neil Frazer, a physicist at the University of Hawai’i. “We considered only the direct effects of sea lice on fish survival. We did not include the secondary effects of increased predation on infected fish.”

“The debate is over,” said study co-author Alexandra Morton, a biologist with the Raincoast Research Society. “This paper brings our understanding of farm-origin sea lice and Pacific wild salmon to the point where we know there is a clear severe impact.”

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Additional information and visuals are available at www.math.ualberta.ca/~mlewis/SeaLice.htm.

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