



## DISEASES AND PARASITES IN FARMED SALMON

Factory salmon farms often confine hundreds of thousands of fish in highly restrictive net pens for all of their adult life. By one estimate, a mature salmon has the equivalent of a bathtub of ocean water.<sup>1</sup> As one fish biologist remarked, “Within one sea loch we’ve got 25 times as many farm salmon as there are wild salmon for the whole west coast of Scotland.”<sup>2</sup>

Salmon farms, consequently, are ideal incubators for parasites and infectious diseases that are then spread to adjacent farms and to wild fish. These outbreaks are impossible to quarantine; mass escapes from salmon farms and the normal flow of tides and currents spread diseases and parasites to other fish over very wide areas.<sup>3</sup>

### PARASITES

Salmon farms harbor two especially virulent parasites: sea lice and kudoa (soft-flesh syndrome). Sea lice infestations have been reported by operators in Canada, Norway, Scotland, and Ireland. Sea lice chew on salmon, creating open lesions that weaken their ability to maintain a healthy salt-to-water balance. A recent study found that sea lice concentrations at one Canadian salmon farm were 30,000 times higher than normal. Lice are dispersed around a farm at concentrations 73 times higher than normally occurring levels. They spread easily to migrating juvenile wild salmon.



Source: Watershed Watch Salmon Society

The second most prevalent parasite in farmed salmon is kudoa thyrssites, commonly called “soft flesh syndrome.” This microscopic insect breaks down muscle fiber in fish, turning the flesh to a jelly-like consistency and making it commercially worthless. Deterioration occurs rapidly after salmon are killed and there is no known cure. Kudoa contamination is usually first detected when salmon are slaughtered and processed. Outbreaks have forced many salmon producers to offer discounts or credits for infected fish.

According to IntraFish, an industry newspaper, the kudoa parasite affects 20–50 percent of all salmon produced in British Columbia, costing the industry there at least \$30 to \$40 million annually. Atlantic salmon, the predominant commercial stock for farming operations, are more vulnerable to the kudoa parasite than Pacific salmon.

## DISEASES

One of the most common diseases in large-scale fish farming is infectious salmon anaemia (ISA). Symptoms include pale gills and swimming near the surface gulping for air. In its more insidious form, fish may develop ISA without showing any signs of illness, even maintaining a normal appetite until they suddenly die. In salmon farms where this occurs, death rates may approach 100 percent.

First identified on Norwegian salmon farms in 1984, ISA has swept throughout the North Atlantic, infecting salmon in Canada, Scotland, Ireland, and the U.S.

Furunculosis, another highly infectious disease caused by the bacteria *Aeromonas salmonicida*, primarily affects Atlantic salmon in both the freshwater and marine stages of their lifecycle, producing boils on their sides. Like ISA, furunculosis has been spread around the northern hemisphere by the global salmon farming industry. The bacterium can be very long-lived in water, where it is easily transmitted among fish. Researchers have shown that furunculosis can be spread between unrelated salmon farms up to 24 kilometres (15 miles) apart, even though no farmed fish were exchanged between them. This bacterium also persists in high concentrations in sediment under salmon pens.<sup>4</sup>

After the first reported outbreak in the 1980s, the disease spread rapidly. In 1988, 32 Norwegian salmon farms were infected; by 1992, this number had jumped to 550 (presumably due to massive escapes in 1988 and 1989). In addition, researchers found furunculosis had spread to more than 74 natural waterways in Norway. In an attempt to eradicate the disease, 20 Norwegian salmon farmers slaughtered all of their fish, an estimated economic loss of more than \$100 million. The cost from mortalities of infected wild salmon, however, is impossible to calculate and it continues.

Furunculosis occurs in salmon farms throughout Scotland, Norway, Canada, the Broughton Archipelago in British Columbia, and Washington State.<sup>5</sup> In early 2005, the disease killed 1.8 million Atlantic salmon smolts at a single commercial salmon hatchery on Vancouver Island.<sup>6</sup>

Juvenile wild salmon with sea lice



Photo by Alexandra Morton

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1 P. Lybberly, "In too deep—the welfare of intensively farmed fish," *Compassion in World Farming*, Petersfield, 2002, <[www.ciwf.org/publications/fish.html](http://www.ciwf.org/publications/fish.html)>

2 CBC News and Current Affairs, "Impact of Fish Farming on Wild Stocks," February 14, 2001 [transcript], <<http://archives.foodsafetynetwork.ca/animalnet/2001/2-2001/an-02-15-01-01.txt>>.

3 T. Hastein and T. Lindstad, "Diseases in wild and cultured salmon: possible interaction," *Aquaculture* 98 (1991), pp. 277–288.

4 David Suzuki Foundation, "Diseases associated with salmon farms: Furunculosis," Website Oceans and sustainable fishing, Aquaculture, Salmon, <[www.davidsuzuki.org/Oceans/Fish\\_Farming/Salmon/Diseases.asp/#Fur](http://www.davidsuzuki.org/Oceans/Fish_Farming/Salmon/Diseases.asp/#Fur)>.

5 D. Morrison, "Furunculosis in the British Columbia and Washington State salmon farming industries," in "Managing furunculosis in the 90s, Proceedings of the second BCMAFF workshop on furunculosis," *Bulletin of the Aquaculture Association of Canada*, 95:3 (1995), <[www.aquacultureassociation.ca/bulletin/bull95-3.html](http://www.aquacultureassociation.ca/bulletin/bull95-3.html)>.

6 D. Wiwchar, "Fish farms causing problems in Muchalet Inlet," *Ha-Shilth-Sa Newspaper*, February 10, 2005, <[www.westcoastaquatic.ca/article\\_fish-farms\\_problems\\_muchalat0205.htm](http://www.westcoastaquatic.ca/article_fish-farms_problems_muchalat0205.htm)>.