



Contrary to agency claims, escaped Atlantic salmon were infected with a highly contagious and harmful virus

Lab results show 100% of escaped Atlantic salmon tested were infected with virus of Norwegian origin.

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Wild Fish Conservancy (WFC) regrets to announce test findings that confirm long held fears about the nature of Atlantic salmon aquaculture in Puget Sound. This week, WFC received test results from an independent lab at the University of Prince Edward Island. WFC contracted the lab to test heart, gill, and kidney tissue samples obtained from 19 Atlantic salmon collected after the massive Cypress Island net pen escape last August. The 19 fish were donated to WFC by commercial, tribal, and recreational fishermen, and were caught in the Strait of Juan de Fuca, the site of the Cypress Island escape, and 50 miles up the Skagit River.

Independent lab results demonstrate that 100% of escaped Atlantic salmon tested were highly infected with Piscine Orthoreovirus (PRV), and that the strain of the virus is of Norwegian origin.



PRV is known to be a highly contagious and debilitating salmonid virus, and is proven to be the causal agent for heart and skeletal muscle inflammation (HSMI) disease.¹ HSMI causes a crippling onset of symptoms in salmonids, symptoms that would either kill or render a wild fish incapable of surviving in natural conditions. HSMI has caused up to 20% mortality in Atlantic salmon net pens in Norway.² Significant mortalities from HSMI have also been reported in farmed Atlantic salmon in Scotland and Chile.^{1,3} Recently, HSMI has been reported in farmed Atlantic salmon in British Columbia.³

Peer-reviewed scientific literature demonstrates a high likelihood that Atlantic salmon net pens infected with PRV will amplify the virus and spread it to wild salmon. PRV survives well in sea water, and is known to spread out long distances from farms.⁴ The spread of PRV from farmed Atlantic to wild salmon has been well documented,⁵ and a 2017 BC study demonstrated that

¹ Wessel, O., Braaen, S., Alarcon, M. (2017). Infection with purified Piscine orthoreovirus demonstrates a causal relationship with heart and skeletal muscle inflammation in Atlantic salmon. *Plos One*, 12(8).

² Morton, A., Routledge, R., Hrushowy, S. (2017). The effect of exposure to farmed salmon on piscine orthoreovirus infection and fitness in wild Pacific salmon in British Columbia, Canada. *Plos One*, 12(12).

³ DiCicco, E., H.W. Ferguson, A. D. Schultze. (2017). Heart and skeletal muscle inflammation (HSMI) disease diagnosed on a British Columbia salmon farm through a longitudinal farm study. *PlosOne* 12(2).

⁴ Garseth, A. H., Ekrem, T., & Biering, E. (2013). Phylogenetic Evidence of Long Distance Dispersal and Transmission of Piscine Reovirus (PRV) between Farmed and Wild Atlantic Salmon. *Plos One*, 8(12).

⁵ Garver, K. A., Johnson, S. C., Polinski, M. P (2016). Piscine Orthoreovirus from Western North America Is Transmissible to Atlantic Salmon and Sockeye Salmon but Fails to Cause Heart and Skeletal Muscle Inflammation. *Plos One*, 11(1).

significantly more wild salmon were infected with PRV if they had been exposed to salmon farms than if they were located far away.²

Peer-reviewed science also shows us that even without the occurrence of HSMI, PRV can negatively impact a salmon's ability to compete and survive in the wild. As PRV builds up in a salmon's red blood cells, the virus may reduce the amount of oxygen cells can transport to the fish's muscles,⁶ lowering the fish's performance. For a wild fish, reduced performance means a reduced ability to capture prey, evade predators, and swim upriver to spawn.

Statistical analysis conducted by WFC ecologist Dr. Nick Gayeski suggests the disease is highly prevalent in escaped farmed salmon from Cypress Island. "Based on the results of this sampling," Dr. Gayeski said, "I estimate that more than 99.9% of the 260,000+ fish that escaped from the Cypress Island net pen are infected with PRV. **For all practical purposes, all of the escaped fish are most likely infected with the PRV virus.**"

The independent lab results corroborate Washington State Department of Fish and Wildlife's (WDFW) recently released report detailing their own findings of PRV-positive Atlantic salmon originating from Cooke Aquaculture's Cypress Island net pen facility.⁷ Yet during a January 30th press conference announcing a state agency investigative report into the Cypress Island spill, a spokeswoman for WDFW, who acted as incident commander and co-authored the report, contradicted the report's own findings, stating:

"The released fish... were healthy at the time of release. Of the escaped fish, there was no disease. No endemic bacterial, viral, or parasitic (including sea lice) pathogens were detected at the time of release."⁸

- Amy Windrope, North Puget Sound Regional Director

"I'm outraged," said Kurt Beardslee, executive director of Wild Fish Conservancy. "The Atlantic salmon in Puget Sound net pens originate from Norway, and we now know they are highly infected with a harmful virus from Norway. **I'm outraged this disease is being amplified into our public waters, and I'm outraged our state agencies are willfully misleading the public. When the public finds out about this atrocity, they will be outraged as well.** Wild salmon are the environmental, social, economic, and cultural cornerstone of this region, we can't afford to put them at greater risk. We need to take corrective actions and remove this dangerous industry from Puget Sound before it's too late."

The lab work presents another stunning revelation, **finding the strain of PRV present in 100% of the tested samples to be of Norwegian origin.** This discovery raises immediate concerns as to whether Cooke Aquaculture is placing infected Atlantic salmon into open-water net pens in our public waters.

In British Columbia, a recent lawsuit provided that many BC salmon farms are being stocked by salmon infected with PRV.⁹ In one instance, British Columbia's predominant Atlantic salmon net pen company conceded that 5 out of 6 of their hatcheries were infected with PRV.

Considering the multitude of scientific studies that demonstrate PRV from open-water pens will likely spread to and harm wild fish, **WFC is deeply disturbed by the disease's apparent ubiquity among escaped Atlantic salmon in Puget Sound, and incensed by WDFW's willingness to obfuscate the existence and harmful nature of the disease.** Even more troubling is the possibility of the virus being imported into public waters from an outside source, as lab results seem to suggest.

⁶ Wessel, O., Olsen, C., Rimstad, E. (2015). Piscine orthoreovirus (PRV) replicates in Atlantic salmon (*Salmo salar* L.) erythrocytes ex vivo. *Veterinary Research*, 46(1), 26.

⁷ Lee, K., Windrope, A., & Murphy, K. (2018, January 30). WDFW, DoE, WDNR. Retrieved from https://www.dnr.wa.gov/sites/default/files/publications/aqr_cypress_investigation_report.pdf?vdqi7rk&iqyk

⁸ WDFW. (2018, January 30th) Retrieved from: <https://www.facebook.com/CommissionerHilaryFranz/videos/787631131444879/>

⁹ Victory for wild salmon as Federal Court strikes down aquaculture license conditions. (2015). Retrieved from <https://www.ecojustice.ca/pressrelease/victory-for-wild-salmon-as-federal-court-strikes-down-aquaculture-licence-conditions/>

To remedy the harm that may be imparted to our wild fish, and to get to the bottom of the disease's source, WFC calls on WDFW, Washington Department of Natural Resources, and Washington Department of Ecology to:

1. Stop all restocking of Atlantic salmon net pens until thorough testing has proven the Atlantic salmon hatchery is not planting PRV infected fish.
2. Immediately test all Atlantic salmon net pens in Puget Sound for PRV.
3. Remove all PRV-infected Atlantic salmon from Puget Sound net pens.
4. Immediately disinfect facilities showing any trace of PRV.

These actions are essential to ensure that diseased, PRV-infected fish are not being planted into public waters and that Atlantic salmon raised in net pens are not amplifying the virus and spreading it in the public's waters where it places our native salmon at risk.

“Hopefully the Washington state legislature will successfully pass legislation to phase out Atlantic salmon net pens in Puget Sound, but in the interim, this alone is far from enough to protect our wild salmon from this industry,” said Kurt Beardslee. “It’s absolutely critical that our state agencies take immediate action to ensure we’re not planting or amplifying viruses into our public waters.”