



A BETTER WAY

COURTESY OF THE FRESHWATER INSTITUTE

EAST COAST CITIZENS ARE MAD AS HELL (AND AREN'T GOING TO TAKE IT ANYMORE!) OVER PLANS TO PLUNK A GIANT SALMON FARM IN SENSITIVE COASTAL WATERS. AT THE SAME TIME, AN ASF FUNDED PROJECT OFFERS A SUSTAINABLE WAY TO FARM ATLANTIC SALMON FOR MARKET.



Maritimers are angry over plans to plunk large fish farms into valuable, but sensitive, coastal habitat. Top: salmon produced in a land-based system which would have zero-impact on marine ecosystems.

They are taking to the streets in the Maritimes. Demonstrations against the creation of one of Nova Scotia's largest fish farms in traditional fishing grounds took place recently in Halifax and Medway. The noisy protests focused on the fish escapes, disease transfer to wild fish populations, antibiotic and chemical hormone usage and release, and waste discharge into coastal environments that have long plagued the aquaculture industry. Now, it is feared the proposed farms for St. Mary's Bay, which will stock almost two million fish, will devastate tourism and traditional fishing industries. The farms also threaten several endangered species, including the North Atlantic right whale, roseate tern, harlequin duck and wild Atlantic salmon.

In hopes of finding a sustainable, long-term solution, ASF has opened up another front in the battle to make farming of Atlantic salmon less environmentally hazardous. The Federation recently partnered with The Conservation Fund, an American non-profit, to find ways to sustainably farm Atlantic salmon in a freshwater closed-containment system. With financial help from ASF, the Fund's Freshwater Institute in Shepherdstown, West Virginia, used a land-based closed-containment system, operated with recirculated freshwater, to produce Atlantic salmon that will average 4 kg by next spring. This is roughly 6-12 months faster than the average salmon harvested in regular sea cages out in the Bay of Fundy or elsewhere in Atlantic Canada.

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The success of this first commercial trial was met with much optimism at ASF headquarters in St. Andrews, New Brunswick. "With concerns growing over the impacts of salmon farming on threatened and endangered wild Atlantic salmon, it is becoming increasingly apparent that the future of salmon farming must lie in closed containment systems," said Bill Taylor, ASF president. "We are putting our purse behind our policy by getting involved with this important research."

Certainly, it's easy to understand how a closed containment system can control waste and eliminate escapees, but the faster growth was an unexpected bonus. "We think that that the faster growth achieved in closed-containment systems is entirely due to the optimized water temperature and dissolved oxygen that are maintained compared to conditions in net pens," says Dr. Steven Summerfelt, director of aquaculture systems research at the Freshwater Institute. "In addition, we have had no fish lice or other obligate fish pathogens that may be somewhat limiting fish performance in ocean pens. Thus, for the past 10 years, we have used no vaccines, antibiotics, pesticides, or harsh chemicals in the water recirculation system, while producing almost 200 tons of salmonids."

UPDATE

In July, local community members from St. Mary's Bay and the Atlantic Salmon Federation launched an appeal to the Nova Scotia Supreme Court to oppose Fisheries and Aquaculture Minister Sterling Belliveau's approval of the two massive salmon feedlots planned for St. Mary's Bay. Both sites were the subject of overwhelming public opposition from local communities. For further updates on the appeal, please visit asf.ca.

Importantly, the land-based technology uses innovative re-circulation techniques that continuously filter and recycle the water used to grow the fish. In this way, large-scale fish farming uses only a small amount of water while releasing little to no pollution.

Jonathon Carr, ASF's Director of Research and Environment, visited the project and was very impressed with



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Land-based, close containment tanks use continuously recycled freshwater. There is zero chance of aquaculture fish escaping or of pollutants entering the ocean.

the amount of water being filtered and reused. "As much as 99.8% of the water flowing through our closed-containment system is continuously cleaned and returned to the fish tanks," he observed. "By continuously filtering and cleaning the water, closed-containment systems control and capture over 99% of fish waste solids and phosphorus during the recycling process."

These recent advances in closed-containment systems are now allowing fish farmers to cost-competitively produce fresh fish in almost any environment, including those with little water supply and strict waste water discharge requirements. The fish can be grown out without use of vaccines, pesticides, antibiotics or harsh chemicals. And more good news. Phosphorus, nitrogen, and carbon from the system can be recaptured for reuse as a soil fertilizer, aquaponics, or for anaerobic production of methane.

"It's quite simple," says ASF President, Bill Taylor, "consistently clean water and exclusion of fish pathogens produce healthy fish at commercial densities. Use of land-based closed-containment systems for farming salmon is the only way to increase domestic fish production in North America without polluting the environment, over-exploiting limited water resources, risking escape of domesticated fish into the wild, or exposing the farmed fish to diseases."

And based on the recent success of the ASF funded work, the immediate appeal of closed-containment technologies is that fish farmers can raise their product near demand centers and closer to energy and supply networks.

"In this way," Taylor concludes, "farmers will be able to market high-value fish raised in a sustainable manner."

Martin Silverstone is editor of the *Journal*. For more information on ASF's exciting research on land-based aquaculture techniques, please visit asf.ca.