Burke, Ruth A

From: kate@earthlovers.org
Sent: Tuesday, February 18, 2020 4:55 PM
To: DEP, Nordic Aqua Farms
Subject: proposed industrial factory fish farm in Belfast
Attachments: Univ of Waterloo.pdf

Dear members of Maine's Board of Environmental Protection,

I am a year-round Belfast resident, and an engaged community member with a BS & MS in Environmental Sciences and over a decade of service as an environmental educator and investigative journalist. I have grave, accumulating concerns about the proposed Nordic Aquafarms salmon factory. I know you are hearing from a lot of people, the vast majority sharing their concerns, but feel a civic duty, and - more importantly, an ecological imperative, to add my voice. As a result of all that I have learned since this industrial mega-project was first made public, I urge you to deny it's permits.

Due to it's scale, this project demands a thorough environmental impact review, conducted by a fully accredited neutral third party and paid for by the applicant. As you are undoubtedly aware, this proposed industrial project has an ENORMOUS footprint, which will undoubtedly harm innumerable protected natural resources for decades - perhaps centuries, to come. Full biological surveys must be conducted through all four seasons, which include birds, bats, and herps of special concern. These surveys need to be conducted by a fully accredited neutral third party and paid for by the applicant.

As you must also now be aware, there are serious issues about their lack of sufficient financing, and about their copious fresh & salt water demand, at a time of increasing droughts and climate uncertainty. Then there are the antiquated dams on the Little River, which have been preventing diadromous fish runs for decades. The species that should be utilizing that river are essential to the recovery of so many other species, and should have been removed back when the Belfast Water District ceased using those reservoirs. This project will prevent that from happening; another unacceptable ecological harm.

I imagine that you share my concerns about the vast amount of effluent - which will include constituents from the unknown feed ingredients, and will undoubtedly negatively impact a recovering ecosystem. There are many signs of recovery, including young cod and the eelgrass they depend on, tagged sturgeons pinging an electronic counter under the Belfast footbridge (before it was vandalized), that will all be set back by this gigantic industrial facility that will be drawing in huge quantities of salt water (what happens to all the organisms trapped in the filters? an unpleasant, prolonged death I'm guessing...) and dumping vast quantities of treated waste into our shallow bay. Algal blooms? At this time in our 'evolution', we can hopefully all agree that dilution is not the solution to pollution. In fact, it never was.

Due to concerns about temperature increases caused by the outflow pipe, a proper impact study of the discharge as a permanent impact, especially thermal, needs to be conducted by a fully accredited neutral third party and paid for by the applicant. Our friends over the border in Canada have proven that fish farm odor plumes effect berried lobsters, which is of significant concern. Also, our struggling Atlantic salmon may be impacted by kairomones (type of hormones) in that effluent that would attract sea lice to the effluent plume.

Should this project move forward, we need assurance that they will never raise genetically modified salmon in that facility, regardless of who owns it.

I've attached a .pdf of an article about a study which proves that the vaccines used by commercial fish 'farmers' are not adequately protecting fish from disease.

Thank you for your service. Please do the right thing; we are counting on you.

Sincerely,

Kate Harris
6 Congress St. #101
Belfast, ME 04915

University of Waterloo. "Vaccines not protecting farmed fish from disease." ScienceDaily. ScienceDaily, 22 January 2018. <www.sciencedaily.com/releases/2018/01/180122091252.htm>.

Vaccines not protecting farmed fish from disease

Date: January 22, 2018
Source: University of Waterloo
Summary: The vaccines used by commercial fish farmers are not protecting fish from disease, according to a new study.

The vaccines used by commercial fish farmers are not protecting fish from disease, according to a new study.

The study was compiled by researchers at the University of Waterloo, the Pontifical Catholic University of Valparaiso and Chile's University of Valparaiso. It showed vaccinated fish tend to show more symptoms when contracting diseases, with the health impacts and ultimately deaths occurring as if they'd never received a vaccine.

"Today's vaccines are marketed to fish farms as necessary disease prevention and are even required by some insurance companies, but they are not nearly as effective as needed under real world conditions." said Brian Dixon, a professor in biology at Waterloo. "Some operators are giving five vaccinations per fish and then there are fish losses from the stress of receiving multiple handlings and injections."

In the study, the researchers tested the efficacy of the vaccine for the bacterial pathogen *Piscirickettsia salmonis* by comparing the reaction of vaccinated and non-vaccinated Atlantic salmon when exposed to the sea louse *Caligus rogercresseyi* in the lab.

They found that although the number of bacteria living inside the fish was much lower in vaccinated fish, they showed many more signs of infection and a higher death rate compared with the unvaccinated group upon exposure to the sea lice.

The study concluded that once vaccinated, the salmon was unable to fight off multiple diseases at once. It's first study showing how a parasite in fish can override the protective effects of a vaccine for another disease.

The experience of salmon farmers in Chile supports this finding, where salmon are raised largely in open cages off the coast, exposing them to variety of pathogens, the most common of which is sea lice.

The researchers say this highlights the need for veterinary pharmaceutical companies to change how they design and test vaccines in the first place, recognizing how different fish immune systems are from the current human model.

"Fish have a limited number of resources to respond to an illness so their immune system makes choices -- when they're infected by sea lice, for example, the fish's immune system is suddenly

geared to respond to that specific threat, leaving them totally exposed to other threats like *P. salmonis*," said Dixon, a Canada Research Chair in Fish and Environmental Immunology. "It's like sending ambulances out to all emergencies when in fact some of those emergencies need firefighters."

In the 2008 Chile's farmed salmon industry was nearly wiped out by Infectious Salmon Anaemia Virus (ISVA). Since then salmon farmers have been turning to vaccines to lower their use of antibiotics while prevent devastating losses from reoccurring disease. But vaccinations are expensive and can cost Chilean operators as much as 30 per cent of cost of raising each fish.

The findings appeared last month in *Scientific Reports*, a Nature journal publication.

Story Source:

Materials provided by **University of Waterloo**. *Note: Content may be edited for style and length.*

Journal Reference:

1. Carolina Figueroa, Paulina Bustos, Débora Torrealba, Brian Dixon, Carlos Soto, Pablo Conejeros, José A. Gallardo. **Coinfection takes its toll: Sea lice override the protective effects of vaccination against a bacterial pathogen in Atlantic salmon**. *Scientific Reports*, 2017; 7 (1) DOI: 10.1038/s41598-017-18180-6