

To: Hawaii State Senators
From: Neil Frazer, Professor, UH Manoa
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Aloha Senators,

I'm writing to you because you will soon be faced with many decisions regarding sea-cage aquaculture in Hawaii. Sea-cage aquaculture is now a kind of "gold rush", and I would be very sad if the sea-cage farmers were allowed to do to Hawaii what they have done to my native coast, British Columbia (Canada) as well as to Norway, Scotland, Western Ireland and eastern Canada.

The main problem with sea-cage farming of finfish is that when practiced on the industrial scale that operators claim to require in order to make a profit, it eventually destroys surrounding wild fish stocks.

To understand why this happens, recall how disease is controlled in wild fish. A diseased wild fish is weaker and slower than a healthy fish. It has a harder time making a living, and it is more easily caught by predators. It doesn't live very long.

Fish in a sea-cage, on the other hand, are fed daily by farmers - they don't have to "work for a living" so being weak doesn't cause them to starve - and they are protected from predators by their cage. When they fall ill they remain alive for a very long time, shedding pathogen into the surrounding waters. The higher levels of pathogen cause wild fish to decline.

The decline of wild fish is not instantaneous. Wild fish populations have large natural fluctuations, and a slow decline is hard to separate from these fluctuations.

If there are just a few sea-cages, the decline of wild fish is moderate. But farmers never stop at just a few cages. They always claim they need economies of scale in order to make a profit, so they keep adding cages. With enough sea-cages, the equilibrium level of local wild fish (of the same or related species) declines to zero.

But it isn't just the wild fish that suffer. Farmers keep adding sea cages until epidemics take place, and epidemics frequently cause catastrophic loss of farm fish as well as wild fish. Nature has an effectively inexhaustible supply of diseases. Treatment often consists of antibiotics or toxic chemical therapeutants in the feed. The losses caused by epidemics eventually force local sea-cage operators to sell out to large multi-nationals such as the Norwegian corporation Marine Harvest, whose salmon farms are destroying wild pink and chum salmon on the coast of British Columbia.

Sea-cage farmers like to say that their production model is no different from production of terrestrial animals such as hogs, but really it is very different. Wild fish and farm fish inhabit the same water, which passes freely through the mesh of the sea-cage. The terrestrial equivalent of a sea-cage would be an industrial hog

farm with wild hogs strolling freely through the barn.

Techno-optimism is a large part of the gold-rush mentality in sea-cage farming, and farmers always claim that disease problems can be solved by technology. In the countries I mentioned above, development of vaccines is heavily subsidized by governments, but is seldom entirely successful. The time required for development of even a moderately useful vaccine is never less than six years, and during this interval losses can be very great.

It's important to point out that traditional Hawaiian fishpond aquaculture did not have the disease problems discussed above. Hawaiian fish ponds included kaku (barracuda) which ate up diseased fish before their disease could spread to other fish. Also the ama'ama (mullet) raised in fishponds could position themselves in the fresh water that welled up from the bottom of the pond, thus ridding themselves of disease-causing parasites. (Most external parasites of marine fishes cannot tolerate fresh water.)

A truly sustainable finfish aquaculture would mimic Hawaiian fishponds as far as possible. It would feature herbivorous fish that eat seaweed grown in the pen, and it would include predators to control disease.

There are other issues in sea-cage farming that you should know about, but the disease issue explained above is the most important. Mahalo for your service to the people of Hawaii.

-Neil Frazer

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