



Calculating the true cost of salmon farming

By Chris Genovali

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There has been a strong push recently by governments in both the United States and Canada for citizens to increase their fish consumption because of health benefits. This presumptive dietary shift, along with the fact that the bulk of seafood caught in Canadian waters is exported, serves as the *raison d'être* for the development of the salmon-aquaculture industry.

“We need to meet the seafood demand” is the mantra of eager government and industry representatives who are keen to reap the associated profits. But the first question is whether or not the demand for species such as salmon, tuna, halibut, and cod is actually sustainable. Is it really possible for these species to “feed the world”, as the industry’s proponents are wont to assert?

In order to farm salmon, harvesting of wild fish (for example, sardines, whiting, and anchovies) for fishmeal and fish oil is required to produce the feed. A recent report by the International Council for the Exploration of the Sea suggests that deep-sea fish in the North Atlantic are being fished at more than twice the rate they can withstand to provide food for farmed salmon. While the debate over local impacts continues, the global impacts of salmon farming have received little attention in British Columbia.

Let’s consider the ecology of farming carnivores like salmon. Corey Peet is an ecologist researching the impacts of aquaculture on the marine environment. As he explains: “Natural food webs take the shape of a pyramid. At the bottom of the pyramid lies an abundance of organisms that gain their energy directly from the sun or chemical processes. The next step up the pyramid are the slightly less abundant organisms, mostly herbivores, that feed on those below them. With each step up the pyramid, only 10 percent of the energy is passed on to the next step, as 90 percent of energy is lost to heat. Therefore, fewer organisms can be supported as you step up the pyramid, leaving only a few predatory species at the apex. In other words, there is a reason why we only see a few carnivores in the wild; nature only has so much energy to go around. Thus, when we consider the farming of salmon against the fundamental basics of ecology, it makes no sense to claim that this practice is sustainable.”

(On a related note, Agriculture Minister Pat Bell should be commended for instituting a moratorium recently on fish farm expansion for B.C.’s north coast, although the province simultaneously approved two new farms for the south coast.)

Leading fisheries experts—such as Daniel Pauly of the UBC Fisheries Centre—caution against “farming up the food web” because of the inefficient and wasteful use of biological resources, all of which are already used by humans and other organisms, and some of which are commercially valuable. Recent estimates indicate that farming salmon requires anywhere from two kilograms to four kilograms of wild fish to produce one kilogram of farmed fish. In contrast, farming herbivorous species (like tilapia and carp) requires minimal inputs of fishmeal.

With the majority of the world’s fisheries in crisis, scientific evidence suggests that salmon farming is hurting more than helping the global fishery problem. In fact, the volume of harvested fish required to support the salmon-farming industry in Europe is larger than the productivity of the entire North Sea, requiring the industry to depend heavily on fishmeal imported from South America. The practice of taking protein sources from impoverished countries in the Southern Hemisphere to produce a luxury product for populations in western countries raises significant ethical as well as ecological concerns. Although the industry will claim that it is continuing to lower its dependence upon marine-derived protein through the development of alternative feeds (such as soy protein), these gains have been offset by the rapid growth of the industry.

Peet also points out that more than 85 percent of the world’s aquaculture production (primarily in Asia) involves the

use of noncarnivorous species (freshwater fish, shellfish, and seaweed), and this has resulted in global aquaculture production adding to world seafood supplies. However, while the global aquaculture industry is a net fish-protein producer, aquaculture of carnivorous fish is a net fish consumer. The rapid expansion of the farming of salmon and other high-value carnivorous species (tuna, halibut, black cod) is occurring mainly in the industrialized countries where the fish are primarily consumed. The reality is that the salmon-aquaculture industry is being driven by short-term economic motives and not the lofty egalitarian goal of “feeding the world”.

Past and current scientific information suggests that farming salmon and other carnivores is not sustainable, contrary to government and industry claims. Salmon farming is not feeding the world but, in actuality, is doing the opposite: it takes resources from poor countries to produce a luxury item for consumers in rich countries. With the growing concern about sustainability issues on a global level, we must ask ourselves if we should be supporting industries that take more than they give back.

Chris Genoali is executive director of Raincoast Conservation.

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