

Salmon Farming: The Bare Bones

Ana Santos, Squamish Streamkeepers

Last spring, I spent a few weeks in Echo Bay, in the Broughton Archipelago, helping with research efforts into salmon farming and the impact of this practice on wild salmon specifically and the marine environment in general. Echo Bay is a community of 25 people. In one little bay, we find the Salmon Coast Field Station, the base for all research efforts into salmon farming carried out independently from the Department of Fisheries and Oceans' (DFO) own studies. Echo Bay is one of many beautiful places in the Broughton.

The people of Echo Bay are proud, and with good reason-there is an amazing wealth of natural resources. Within half an hour of digging, you can get a bucketful of butter-clams for breakfast. Within a few minutes of setting a shrimp-pot, you can get enough prawns for lunch. And, after a few seconds of staring into the very clear water, you can find enough crab to fill you up at dinner time. The abundant wildlife love it all too, but they depend on these resources, more so than we do.

Aquaculture (fish farming) has been driven by the decline in ocean fisheries and the rise in the global demand for fish. There are currently 27 salmon-farming operations in the Broughton. The farms sit right on the water, sharing the environment with the wild ecosystems in the area. Everything that they put in the water (chemicals for cleaning nets, fish feed with drugs, antibiotics, etc.) immediately becomes part of the surrounding environment in the form of surplus food and feces.

This means that, although aquaculture may increase fish supply, there are ecological risks associated with it: the contamination of the natural resources (the natural resources that we enjoy and that the wildlife depend on), competition of farm fish with wild fish (as sometimes farmed fish escape in the thousands), depletion of wild fish caught to feed farm fish (as it takes 3 to 5 kg of wild fish in the form of feed to produce just 1 kg of farmed salmon), and the spread of infection from farm fish to wild fish.

During the last few years, we have witnessed the demise of wild salmon stocks as a result of lice infestations that originate in the fish farms. Farm salmon are commonly infected with lice. Lice are also naturally common on wild adult salmon. These adult fish have scales though, so the lice are not a problem. As well, the lice need salt water to survive, so they die when the wild salmon enter the fresh water rivers, well before the appearance of the fry, which do not have scales and cannot withstand the parasites' attack. On the contrary, farms constitute permanent breeding grounds for lice, as farm salmon remain in salt water year round, and the wild salmon fry become infected as they travel along their migration routes past the fish farms. It only takes between 1 and 3 lice to kill a fry.

Outbreaks of lice infestation have been of such magnitude in recent years that some areas have been threatened with the possibility of complete local extinction of wild salmon stocks. We should bear in mind that, overall, we stand to lose a great deal: If the wild salmon goes, everything else goes with it, since the salmon feed the wildlife in the water (steelhead, cutthroat trout, seals, sea-lions, whales), the wildlife on land (bears, wolves), the birds (eagles, gulls), and even the forests along our coasts (in the form of fertilizer).

This is why independent researchers, students and volunteers at the Salmon Coast Field Station spend so much of their time looking at fish. This is how they do it:

- Every morning, rain or shine, they set off on a skiff. Along the shores of the hundreds of islands and inlets that form the Broughton Archipelago, they look for schools of young salmon. When they find one, they look for an adequate spot to set one person on land with one end of a seining net. The boat then draws a semicircle

around the fish, and when reaching the shore again, another person jumps out of the boat with the other end of the net. The two netters walk and climb towards each other pulling the net in at the same time.

- Once together, they pull it in almost completely, so the school of fish is easily accessible in a very confined space. With a lot of care not to kill any fry in the process, the fish are transferred from the net to buckets full of water.
- So you end up with buckets full of fish on the boat. And, hopefully, among all of them, you find 50 pinks (*point*) and 50 chums (*point*), the established amount for the validity of the study method. One by one, the fish are measured, examined for lice, scars, and any other abnormalities they may be present. The data is recorded at the same time. Once there are 50 pinks and 50 chums in the datasheet, the fish are released exactly in the same spot as they were found.

When I was there in April, we found lice numbers were low compared to other years. By mid-June, however, we had infestations of up to 80% in some areas, which is high and comparable to years of heavy infestation (e.g. 2004 and 2005). So, why this jump in figures in just a few weeks?

Meet SLICE.

SLICE is a drug added to the feed in an attempt to get rid of the parasites. Although the drug is not officially approved for use in Canadian waters, the farms experiment with it. However, treatments are costly – it takes \$200K to treat one farm just once. Last year, the farms treated their fish at the end of February, hence the low lice numbers found in April. But, due to the great expense, the farms did not treat their fish again; the effects of the drug wore off and high levels of infestation were seen a few weeks later.

There may be many reasons why the use of this drug has not been approved yet, but one of them is likely to be that we don't know much about it or about how it affects the surrounding environment. This is why current research efforts are increasingly focusing on the health of marine ecosystems adjacent to the farms; for instance, prawns and other bottom-dwellers are being very carefully examined right now.

And let's not forget about the effects that these drugs, chemicals and pesticides used in the farms may have on us. These fish are showing up with tumors and all sorts of abnormalities. We now know that:

- farmed salmon receive more antibiotics by weight than any other livestock.
- due to the high fat content in their feed, farmed Atlantic salmon contain 70% more fat than wild Atlantic salmon, and 200% more fat than wild Pacific pink or chum salmon.
- farmed salmon are administered chemical dyes to color their flesh an appealing salmon pink; otherwise, their flesh would be grey.
- Slice itself, the parasite-killing drug, takes 60 days to purge from farm fish to levels acceptable for human consumption.

There used to be many unknowns surrounding the issue of salmon farming, ... not any more. Many conclusive studies already exist about the impacts of this practice. It is urgent that we separate wild fish and farm fish, particularly along salmon migration routes.

Studies continue, and the research season is once more underway in Echo Bay. I was there last month taking a look at the fry, but we'll have to wait until the end of the season to really know how things stand this year.

In the meantime, we should bear in mind that we don't need to be experts or professionals to make a difference. As individuals, we can also make ourselves heard and our voice can have an impact. What can we do as individuals? (*Don't buy farmed salmon – at the store, take a good look at the label; at the restaurant, ask where the fish you're about to order comes from.*)