

Farmed Salmon Escapes in British Columbia

Marine Harvest Canada raises Atlantic salmon in British Columbia. Once moved from freshwater hatcheries and rearing facilities, fish are grown to market size in ocean pens located along the 27,000 kilometre BC coastline. A key management goal for the company is to ensure that neither hatchery nor ocean fish escape into the wild. Fish lost to an escape represent a financial loss to the company. We also recognize a public concern that farmed fish escaping into the wild may pose a threat to the marine environment.

There is a particular concern related to the competitive interaction with wild salmon and possibility of interbreeding. In theory, competition for spawning habitat and food sources could stress wild salmon populations. Similarly, if escaped farm fish were to breed successfully with wild Pacific salmon this could alter the genetic diversity of wild stocks.

What we know about escaped farmed salmon in British Columbia waters is based on 15 years of research and observation.

Do farmed salmon that escape into the marine environment from hatcheries or farms breed with wild Pacific Salmon? It is possible for farmed *Chinook* and *Coho* salmon to breed with their wild cousins. On the other hand Atlantic salmon—the preferred species for farming in British Columbia—**cannot** breed with Pacific salmon. Attempts to cross breed Atlantic and Pacific salmon in controlled laboratory experiments have not been successful. Additionally, there have been no observations of successful inter breeding in the wild.

Is there any evidence that farmed Atlantic salmon have reproduced successfully in the wild? Between 1996 and 2002 data compiled through Atlantic Salmon Watch tallied 367 juvenile Atlantic salmon captured or sighted in 12 BC freshwater streams. Of these, 223 were believed to have been escapes from hatcheries, while some of the remainder appeared to have been reared in the wild, but no evidence has been collected that indicates that Atlantic salmon have migrated to sea and returned to natal streams to spawn.

But why wouldn't Atlantic salmon thrive in the Pacific? This is a good question and one that hasn't been definitively answered. Between 1905 and 1935 fisheries managers introduced 8.6 million juvenile Atlantic salmon to BC streams to establish sports and commercial fisheries. Elsewhere in the Pacific Northwest these efforts continued until 1991. However, the net result was that these fish vanished into the wild--notwithstanding that from the Great Lakes to the Pacific Northwest and Alaska fisheries specialists have succeeded—sometimes spectacularly—in establishing populations of exotic salmon species and hatchery-raised fish in local waters. It may simply be that the Atlantic salmon just isn't suited to Pacific ecosystems. In the case of farm-raised Atlantic salmon

it may be that their genetic disposition is closer to domestication than life in the wilderness; imagine a Holstein cow competing for forage and habitat in the wild.

If large numbers of farmed Atlantic salmon escape from a farm won't they compete for food with wild salmon? This seems like a reasonable conclusion, but from birth farmed salmon are conditioned to feed on pellets provided by the farmer. In the open ocean they have to become predators and hunt and feed on wild species conditioned to avoid them. Upon examination, escaped Atlantic salmon that have been caught in Pacific waters almost always have an empty gut. In a few cases they have been found with herring in their stomach, but more often than not they are hungry and have only the remains of pellets in their gut.

For some perspective on this particular concern, it should be noted that 1.4 billion salmon are intentionally released into the Pacific Ocean from hatcheries and net pens in Alaska – called 'Ocean Ranching'. Ranched salmon are intended for commercial gain and are in addition to the ocean's carrying capacity. Farmed salmon escapes represent a very small percentage when compared to ranched salmon releases.

So there are unanswered questions, but isn't the risk to Pacific salmon too high to gamble? With farmed Pacific salmon as with hatchery-raised fish there is reason to be concerned that genetic diversity could be at risk. However, based on the evidence fisheries specialists generally agree that escaped farmed Atlantic salmon pose a low risk to Pacific salmon. As salmon farming is now established in British Columbia and capable of at least modest growth, ongoing research into the interaction between farmed Atlantic salmon and wild Pacific salmon needs to continue.

Whether escapes of Atlantic salmon from Marine Harvest Canada's BC farms pose a threat to the environment, we will continue to improve our management and use of technology to reduce the likelihood of escapes. We will also continue to publicly report and document escapes and our response measures. As part of our daily business we will collaborate with government, stakeholders and First Nations to reduce or mitigate the impact of our company's operations on the marine environment.