

## **The Value of Wild Salmon to BC's Nature Based Tourism Industry and the Impacts of Open Net Cage Salmon Farming**

For thousands of years the wild salmon has helped nourish the plant and animal life of BC. Salmon bring nutrients from the open ocean back to the coastal ecosystem. Killer whales, bears, wolves, birds, and even trees depend on salmon. More recently this phenomenon has supported a significant part of British Columbia's nature based tourism industry. If we lose our wild salmon there's a lot we are going to lose with them – including other industries such as fishing and tourism.

Starting life in the streams and rivers of the forest, the salmon travels to the ocean where it lives for up to five years fattening on the ocean's bounty before returning to the stream or river in which it was born. Recent research has shown a link between salmon, wildlife and the forests. Several pounds of body mass made up of carbon, nitrogen and other nutrients the entire system needs are imported to the local ecosystem.

As the salmon return to the rivers, so to do the bears and other vertebrates. Observations of bears and other predators during salmon spawning season show that when they catch salmon they may drag the fish hundreds of meters from the stream to find a safe place to feed. The predators rarely eat all the fish and the rest is left to decompose. Plants are fed when carcasses decay and fertilize the soil, or when the dead salmon enter the food chain and eventually return to the soil as droppings. There are at least 20 vertebrate species, including, of course, bears, but also surprisingly, deer and elk, which during spawning season are known to feed directly on salmon carcasses. Before the salmon actually get to their destination rivers orca whales, sea lions, and other marine life also feast on them.

This annual celebration of nature and the complex ecosystem that it supports provides exceptional opportunities for wildlife viewing, nature study and photography. Bears in particular congregate in vast numbers along coast river estuaries feasting on salmon and reading themselves for their winter hibernation. Wildlife viewing and nature based tourism on BC's coast is very much dependent on areas with high salmon resources or otherwise high habitat effectiveness values that the salmon provides.

Wildlife viewing, and coastal nature based tourism in general, are considered to be high-value tourism products providing high yields and significant value added to BC's economy (Swain 2007). This sector is experiencing tremendous popularity and growth both on BC's coast and in Interior locations. A study conducted by Tourism British Columbia, in partnership with the B.C. Wilderness Tourism Association and Council of Tourism Associations, shows that wilderness and nature-based tourism represented 12 per cent of the total revenue generated by B.C.'s tourism sector in 2005. That year more than 1.2 million tourists spent approximately \$1.2 billion dollars on nature-based tourism in British Columbia. Based on a steady growth curve over the last several years we can expect that number to increase to \$1.4 billion in 2008.

As a majority of these tourism operations are based on the coast of BC we can predict that at least half of that, or \$700 million, is directly based on salmon resources. In addition, using

standard multipliers for this sector it is expected that salmon based nature tourism will contribute \$1.5 billion in value added to BC's economy combining the direct, indirect and induced benefits. Nature based tourism operators are local businesses and residents who hire BC citizens, purchase local services, and pay local, provincial and federal taxes.

Another significant sector, and one often included in the tourism sector, is sport or recreational fishing. BC's has a reputation as one of the world's premier angling destinations and there are excellent examples of extraordinary fishing in areas throughout the province where anglers can selectively catch world record size fish. BC's tidal recreational fishery generated over \$640 million in retail sales and distribution in 2005 with significant multiplier effects combining the direct, indirect and induced benefits.

As indicated, nature based tourism (and of course sport fishing) on BC's coast is very much dependent on salmon resources. Sadly, many wild salmon populations have been threatened because of habitat destruction, over-fishing and now because of salmon farming. The recent science indicating significant mortality in BC's salmon stocks due to sea lice generated by open net-cage fish farming gives a clear warning to the BC's tourism industry.

Fish farms are causing a deadly collision between the vulnerable young salmon and sea lice. These smolts are not equipped to survive this, and independent research is proving that they don't. Over the years the number of farmed fish has increased. There used to be only a few farms, each holding about 125,000 fish. But now there are over 120 farms on the coast, some holding 1.3 million fish, providing a perfect habitat for lice that wasn't there before. Compounding the situation is the location of farms as many are located on the migration routes of the young smolts

We are now discovering that the problem may not only be specific to pink salmon in the Broughton Archipelago, New research published online by the North American Journal of Fisheries Management reports that infestations of sea lice have spread to juvenile pink, chum, and sockeye salmon as well as juvenile herring near fish farms throughout the Discovery Islands (Morton, Routledge and Krkosek). In 2005 researchers found four times as many wild juvenile salmon were infected with sea lice near fish farms than distant from the farms. Then in 2006 when most of the farms were empty, the sea lice declined. This is a similar pattern as found in the Broughton Archipelago.

Pink and chum salmon were the primary focus of the study, but herring and juvenile sockeye (most likely migrating from the Fraser River) were also examined and found infested with sea lice near the farms. We understand this is the first report of sea lice on juvenile herring and sockeye salmon. This new evidence is alarming and is a strong indicator that the devastating impacts of fish farms are much more far-reaching than we had yet imagined.

The impacts the open net-cage fish farming industry will have on the sport salmon fishing and Nature based tourism industries in B.C. will be damming and irreversible. Not only will BC residents be unable to purchase a wild salmon from its local distributor, but also there will be no bears, orcas or eagles for tourists to come and see - the very icons that make up Super Natural BC. The Nature based tourism and sport fishing tourism sectors make economic contributions to B.C. that far outstrips the contribution made by salmon farms. However the continued operation of open net-cage fish farms puts the future of all of these economically significant sectors at risk.

Currently the BC government has called for more drug use to control lice. This is a band-aid solution, which only creates further concerns for environmental and human health. We

understand that the drug, Slice – a neurotoxin that persists in sediments for 160 days, which is used extensively by fish farms has not been approved for use by Health Canada and may have significant impacts on the marine ecosystem.

We need government to implement urgent policy that protects wild salmon from farm fish. We need government to immediately remove or fallow fish farms in identified wild salmon nursery areas where research has shown impacts. We need government to conduct research on the conditions around the farms and impacts to wild salmon at all sites throughout the coast so they can assure us that the impacts to wild salmon from open net-cage fish farms is not widespread and systemic as the independent research suggests. Ultimately the only real measure that is going to work to fully protect wild salmon and *our* industry is separating the farm and wild salmon. This can only be achieved by complete closed containment technology, but this goal is years away from implementation. In the meantime fish farms must be moved off key salmon migration routes.

### **Ecosystem Based Management Approach for Salmon Farming in BC.**

It is suggested by government that the province should pursue an Ecosystem Based Management (EBM) approach to salmon farming in BC. The WTA couldn't agree more. Such a system of course focuses on the ecosystem and all other values: social and economic, need to work with the laws of nature. In such a system wild salmon and the high habitat effectiveness values that the salmon provides would be the highest management priority.

There are two main caveats to EBM: following the precautionary principle and following the principles of adaptive management. With respect to the precautionary principle it is said that the science is unclear and that "at present there is no scientific consensus on whether sea lice from farmed salmon are causing the demise of wild pink and chum populations". "Reasons for lack of clarity include knowledge gaps about sea louse natural history and ocean currents as well as disagreement about the design of mathematical models for predicting louse dispersal and spread of infection". If there is in fact doubt is our society prepared to take a chance that the science indicating that sea lice from farmed salmon are in fact causing the demise of wild salmon populations is right!

Based on the precautionary principle we should be taking a risk avoidance strategy and moving, fallowing or closing altogether the farms on all key salmon migration routes including the Broughton Archipelago. Researchers have observed that when farms on a primary migration route were temporarily shut down, or fallowed, sea lice numbers dropped (Morton and Routledge 2005) and salmon populations increased (Beamish et al 2006). The WTA also proposes a moratorium on the expansion of open net caged finfish aquaculture on the coast of BC until we have proven results that wild salmon are thriving in a fish farm environment.

With respect to the principles of adaptive management the Legislative Committee on aquaculture (whose mandate is to represent the values of BC Citizens) is clear that a goal for the salmon farm industry should be a move to closed containment for a number of ecological reasons from sea lice infestation, potential contamination predator conflicts etc. Marine based closed containment fish farming is proving to be viable on a small scale. However the initiative needs significant investment and confidence to become viable on an industry wide level. To date both government and industry have not taken any steps towards closed containment systems and in fact they have pushed back hard on the concept giving a host of reasons including cost. Based on the principles of adaptive management Industry (with government support) needs to make a start in this

direction and develop a strategy of how they will develop closed containment systems and how they will transfer existing open net pens to the closed containment sites. The B.C. Special Committee on Sustainable Aquaculture recommended a move to complete closed containment within 5 years.

The fish farm industry also has some work to do on the science front. The Pacific Salmon Forum states that “the burden of proof - that sea lice from farmed Atlantic salmon *don't* cause population decline in wild salmon - is with the fish farming industry.” The first step of adaptive management would be to become more engaged in the scientific and public debate and gain a better understand of the issues and potential impacts. Neither government nor the Pacific Salmon Forum has undertaken research to try and define the depth of the sea lice problem. Without this research we need to assume that the problem exists throughout BC and the devastating impacts of fish farms are much more far-reaching than we had yet imagined. We need government to conduct baseline research, as soon as readily possible, to find out the extent of the salmon farm problems. A start would be for government and industry to release the farm site data that has been accumulated in Clayoquot Sound over the past four years. We need to know what the real conditions are around all farms throughout the coast? With the right information and data available, then we can all work together towards a truly successful and sustainable industry.

The WTA is confident the aquaculture and the Nature based tourism industries can co-exist and flourish, provided both are operated in a sustainable manner. We should envision a situation where we can brag to our visitors and guests that BC has decided to take real sustainable approach with its salmon farming industry. We have decided to be leaders in “Green” or “Blue” or “Organic” farming practices by using closed containment systems, natural feeds and no chemicals. Therefore we urge the Province, the government of Canada and the industry to commit to a program exploring emergent technologies and work with First Nations and stakeholders in selecting the most ecologically and economically viable model for a full-scale operational trial. We should note that First Nations communities up and down the coast are looking at tourism development opportunities as *their* primary industry. The WTA and COTA, in partnership with Aboriginal Tourism Association of BC, can certainly be conduits for engaging is these opportunities and help First nations communities on a path of sustainable community economic development.

The Wilderness Tourism Association exists to ensure the ongoing viability of our industry by protecting the wilderness tourism land base and associated marine resources. We are an organization of adventure tourism operators working to enhance the wilderness experience through advocacy and education and through involvement with government and public and private enterprise.

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