SFU

Speaking for the Salmon

FRASER SOCKEYE SALMON: AN UNCERTAIN FUTURE
Charting a Course of Action on Cohen Commission Recommendations
Statement from Scientists' Think Tank

February 27, 2013

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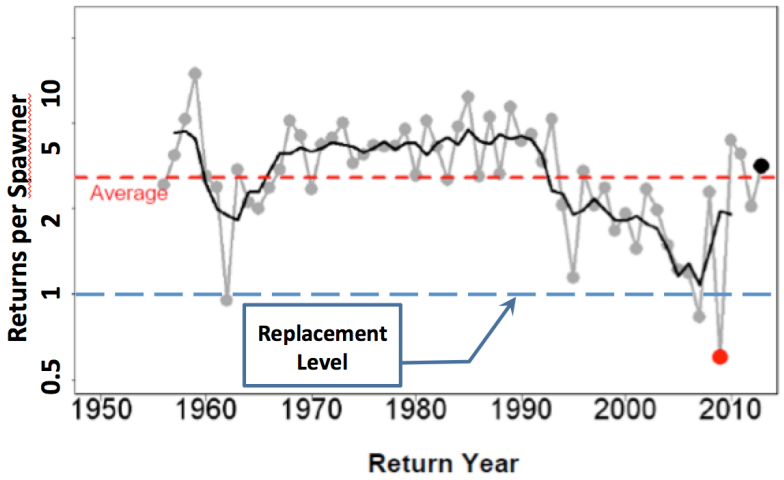
Twenty-four scientists from Canada and the USA met at Simon Fraser University on February 25th and 26th, 2013, to discuss implementation of the scientific recommendations of the Cohen Commission of Inquiry into the decline of Fraser River sockeye salmon. Declines of fish productivity since the early 1990s culminated in 2009 with the lowest ever recorded. This loss from what was once one of the world's largest salmon-producing watersheds brought serious hardship for Aboriginal, commercial and recreational fisheries, and posed threats to a wide variety of wildlife that depends on the annual salmon run. The Cohen Commission was established by the government of Canada in November, 2009 to investigate the causes of this decline and recommend ways of improving management.

The 1200-page Cohen report was delivered three years later, on October 29th, 2012. The scale of the investigation was unprecedented. It was based on testimony from 179 witnesses and scrutiny of more than 525,000 government documents, including more than 242,000 emails, at a cost of $26 million. This enormous undertaking yielded 75 recommendations, and we are awaiting a federal response.

How can we move forward with the Commission's recommendations? To help answer this question, Simon Fraser University assembled a team with a wide range of scientific expertise, including several expert witnesses to the Commission.

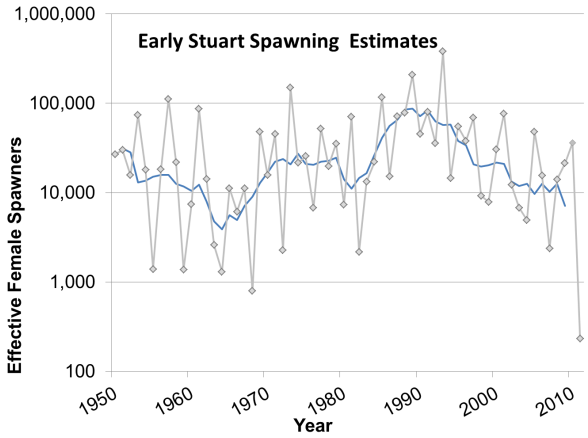
Update on status of Fraser sockeye

We begin by reviewing new information about the status of Fraser sockeye, which became available after the Commission was established in 2009. The overall productivity of the fish, which is the number of returning adults produced per parent, has fluctuated strongly in the last few years, and 2010 (just one year after the lowest returns that triggered the Commission) saw both near-average productivity and some of the highest total numbers returning from the ocean.



Each dot is the number of adults that returned to the coast per parent from four years previous. The solid curve is a running average. Note the low productivity in 2009. The final dot is a forecast for 2013; such forecasts are always uncertain.

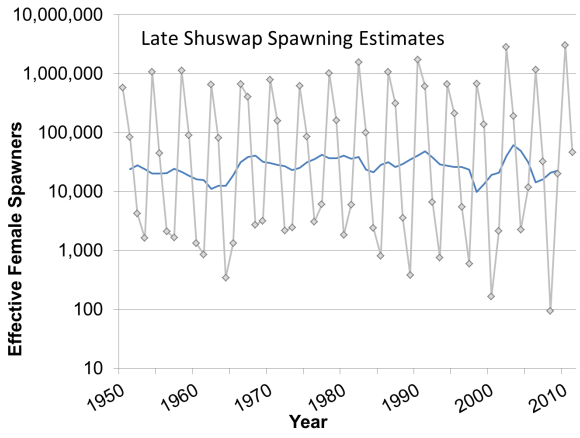
At first glance, the above figure may suggest that the fish are returning to numbers that were typical before the 1990s. However, it masks a more mixed story for the individual rivers in the Fraser watershed. For example, there have been continuing severe declines in fish that spawn in the part of the upper Fraser watershed, known as the "Early Stuart" group. The Quesnel population, the poster child for recovery in the late 1900's, has also declined substantially.

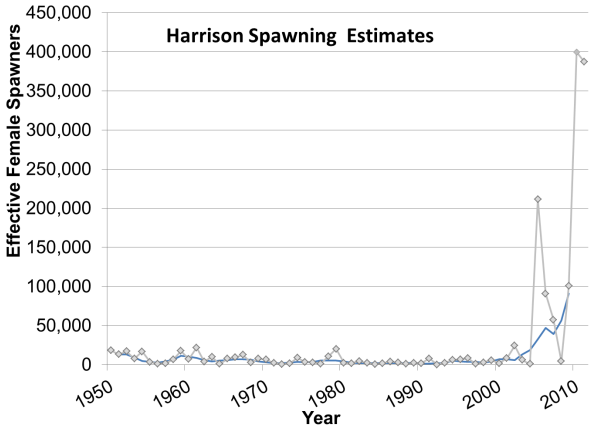


Estimated numbers of female spawning sockeye in the "early Stuart" group. The line is a four-year running average. Note the log scale.

Fish spawning in other rivers such as the Late Shuswap population that includes the world-famous Adams River run have had more consistent returns, and populations such as those from the Harrison River have bucked the overall trends and grown spectacularly. The Harrison fish have a different migratory behaviour from the other Fraser watershed fish: the young fish proceed to the Fraser River estuary soon after they emerge in the spring, arriving in the sea during their first summer, and most of them migrate out Juan de Fuca and up the west coast of Vancouver Island instead of travelling north between the island and the mainland.

Diverse populations respond differently to environmental change. In light of impacts of on-going climate change on the fish, both in freshwater and at sea, it is imperative to conserve and manage for the full range of diversity in genetics, life-histories, and behaviour.





The above graphs show numbers of female spawning sockeye salmon (dots) and four year running average (solid line). These represent examples of different population changes across Fraser sockeye populations.

Habitat monitoring and protection: the Wild Salmon Policy

Monitoring and protection of salmon habitats is a prominent feature of many of the Cohen Commission's recommendations. For example, there is strong encouragement to implement Canada's Wild Salmon Policy (2005), including its strategy for monitoring habitats. While the Cohen Commission was in progress, the federal government introduced sweeping changes to Canada's Fisheries and Environmental Assessment Acts through Bill C-38. Justice Cohen recognized the serious implications of these fundamental changes. Indeed, these legislative changes appear to have undermined both the Wild Salmon Policy and the Cohen Commission's recommendations about implementations of habitat policy. Specifically, the changes to the Fisheries Act have weakened fish habitat protection, for example by replacing prohibitions on disruption of fish habitat with a need to demonstrate "serious harm" to fish, defined as death or *permanent* alteration or destruction of habitat. This and several other changes have introduced a great deal of uncertainty into habitat protection. The details of how this new legislation will be interpreted remain to be seen, and probably won't become clear until they are tested in the courts. Regardless, the Think Tank emphasized that the scientific case for monitoring and protecting fish habitats *have not changed,* and so the force of the relevant recommendations made by the Cohen Commission remains.

The Think Tank strongly endorsed Commissioner Cohen's recommendation of the creation of a senior position within DFO with the sole purpose of leading the implementation of the Wild Salmon Policy in a timely manner. Several of the Policy's deadlines have already passed, and while there has been good progress on some components, such as designation and assessment of sub-populations for salmon conservation, progress on other objectives has been very uneven. This includes habitat monitoring, incorporation of ecosystem values into management, and integrated strategic planning, which is key to converting science into action.

Many non-government organizations are already playing an important role in research and monitoring of salmon populations and their environments. These include First Nations, academic researchers, environmental organizations, and community groups such as Stream Keepers. There is an enormous amount of goodwill, commitment, and information available from such groups to support the Cohen Commission's recommendations on fish habitats. A high-level DFO position with a mandate for implementation of the Wild Salmon Policy can tap into this enthusiasm to form effective partnerships to get the job done.

The Cohen Commission also recognized the many contributions that the province of British Columbia could make toward restoration and sustainability of Fraser sockeye. The Think Tank recommends that the province should enter into a formal agreement with DFO to share in the many aspects of Wild Salmon Policy implementation that fall under its jurisdiction. For example, while the federal government is responsible for salmon, the province is responsible for the water in which they swim, the trees that shade their streams, and the gravel in which they spawn. The province is therefore a natural ally in protection of fish habitats, and a key stakeholder in the vital economic, social, and cultural benefits accrued from healthy habitats and the salmon they support.

Integrating science across the sockeye life cycle

The complicated life cycle of salmon poses a challenge for science and action. We agree with Justice Cohen that we must continue to do some things, such as the annual counts of adult sockeye on the spawning grounds, which forms the backbone of our understanding of populations. We need to improve our understanding of what happens to juvenile fish, beginning with the number that leave lakes each spring on the journey to the sea. We therefore endorse Justice Cohen's recommendation to increase the number of smolt counting stations from two to four (of the approximately 36 conservation units). We need to continue to follow the fate of juvenile salmon after they enter the sea, in order to illuminate the infamous "black box" of marine survival. Thus, we need to gather and synthesize information across the salmon life cycle on environmental variables, predator-prey interactions and links to larger scale processes such as climate variation.

As the Cohen Commission learned all too well, such synthesis poses real challenges. There is a need to coordinate, analyse and communicate the ever-changing state of knowledge of Fraser River sockeye salmon and their environments. An independent collaborative research coalition that includes DFO could facilitate the exchange and *transparency* of information for monitoring and management across the life cycle. New analyses with this transparent framework would facilitate new management strategies, for example, for red-zone (endangered) populations. No single agency can do this on its own: we need coordination of the efforts of the many independent groups that gather information. This information will be critical for implementing the Wild Salmon Policy and facilitating management of Fraser sockeye.

Aquaculture impacts

There was strong support for Justice Cohen's use of the Precautionary Principle in the issue of potential impacts of aquaculture on Fraser sockeye. Justice Cohen correctly placed the burden of proof on DFO to show that there is no more than a minimal risk of serious harm to wild salmon from salmon farms. If this could not be proven, he recommended removal of the salmon farms from the Discovery Islands by 2020. There is emerging evidence for the presence of viruses in wild Pacific salmon that are known to cause serious health problems for farmed Atlantic salmon and farmed rainbow trout in other parts of the world.

There was agreement that if certain clear criteria were met, the level of a "more than minimal risk of serious harm" would be reached. Importantly, and with a view to the 2020 deadline, we felt that demonstrating a population-level impact was neither a feasible nor a necessary requirement under the precautionary principle. Some participants felt that there is already sufficient evidence of "more than minimal risk of serious harm", while others wanted more evidence. It was generally agreed that the following set of three criteria, evaluated by credible and robust scientific means such as through peer-reviewed journals and accredited laboratories, would indicate more than minimal risk:

A. There should be evidence of the presence of the infectious agent in both farmed and wild species.
B. There should be evidence that the infectious agent can be transmitted from farmed to wild salmon. This evidence could be correlative.
C. There should be evidence that the infectious agent causes disease in wild fish, such as tissue damage or impaired performance. This evidence could also be correlative, though confirmatory experimental evidence would be preferred.

Conclusion

The Cohen Commission gathered an enormous amount of information and recommended an extensive set of actions. This $26 million investment demands action. We urgently need collaboration among NGO's, First Nations, governments, academic institutions, and industry, and we need a transparent mechanism for overseeing implementation.

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