

## EXECUTIVE SUMMARY

### **Project 5C: Impacts of salmon farms on Fraser River sockeye salmon: Results of the Noakes investigation**

A question that has garnered considerable public attention and one that is the focus of this report is whether there is a relationship between farmed salmon production and the returns of Fraser River sockeye salmon. There are many aspects of this complex issue that need to be considered and the terms of reference for this project include four broad areas of interest (Appendix 3). These include 1) issues associated with Atlantic salmon escapees; 2) the effect of farm wastes on benthic and pelagic habitat quality, and disease issues which are partitioned in two 3) sea lice given the extensive public debate around this issue, and 4) other diseases. The last topic that will be addressed, managing and mitigating risks, will make recommendation specific to salmon farming in British Columbia with respect to Fraser River sockeye salmon.

The information contained in this report is from the analysis and synthesis of a) peer-reviewed publications and other documents including the technical reports submitted to this Commission, b) summaries and analysis of data provided to the Commission by industry and government as well as data that are publically available or provided from other sources, and c) interviews with individuals from government, industry, academia, and others (Appendix 1). The disease data provided by industry and government were extremely useful in assessing the potential impacts of salmon farming on Fraser River sockeye salmon and the assessment of the data provided in this report may help clarify some of the misconceptions that exist in the public's mind.

The debate around salmon farming is highly polarized as evidenced by the media attention it has and continues to receive, the number and tone of aquaculture related comments submitted to this Commission, and the very divergent and strongly held views expressed and advanced in some of the publications reviewed in this study. Some of the publications are highly speculative for a variety of reasons including but not limited to the absence of data from government and industry as well as assumptions used by the researchers. In some cases, the publications were deficient to the point that they were neither objective nor scientific and they generally lack credibility.

The industry is highly regulated with very extensive requirements for monitoring, proactive and reactive intervention to resolve disease and waste issues and problems, and mandatory reporting. The volume, quality, and level of detail of the data provided to the Commission by both industry and government is impressive and I believe providing summaries of this information at an appropriate level will help build confidence in this industry with the general public. While some improvements are certainly possible and desirable, the industry generally leads the world in with respect to the management and control of disease and waste at their farm sites both through proactive policies and practices. Overall, the evidence suggests that salmon farms pose no significant threat to Fraser River sockeye salmon and that salmon farming has not contributed to the recent decline in Fraser River sockeye salmon productivity.

## Key Findings

1. There is no significant correlation between farmed salmon production within the main migration path of Fraser River sockeye salmon, the waters between Vancouver Island and the mainland of British Columbia, and the returns of Fraser River sockeye salmon. No causal relationship was found between the two time series and there was no apparent plausible link between farmed salmon production which is governed by condition of licence and the returns of Fraser River sockeye that are a function of the number of fish that spawned 4 years previous as well as a variety of environmental factors.
2. There is no evidence that escaped Atlantic salmon have contributed to the decline in Fraser River sockeye salmon stocks or that escaped Atlantic salmon pose any threat to sockeye or any other salmon stocks in the Fraser River. No juvenile Atlantic salmon have ever been observed in the Fraser River and only 2 adult Atlantic salmon have been found in the Fraser area (Area 29) in the last decade.
3. There is no obvious plausible link or evidence to support a link between the deposit of waste on the sea bed or into the water column and sockeye salmon survival. The impact of waste appears to be limited to the immediate vicinity of the farms (within 30m).
4. There is no significant correlation between the number of sea lice on farmed salmon and the return of Fraser River sockeye salmon. The average number of lice (*Lepeophtheirus salmonis*) on farmed salmon has decreased from approximately 3 lice/fish in 2004 to between 1.0 lice/fish (annual mean) and 0.5 lice/fish (the April – June average - the time period when juvenile sockeye salmon are migrating past the salmon farms) in 2010.
5. The evidence suggests that disease originating from salmon farms has not contributed to the decline of Fraser River sockeye salmon. Since 2003, no outbreaks of IHN have been reported on any salmon farm. Only 1 or 2 cases (per year) of vibrio were reported on salmon farms for 5 of the 9 years between 2002 and 2010. Since 2003, the majority (29 of 38) reported cases of furunculosis were from farms on the West Coast of Vancouver Island with an average of only 1.3 cases/year on farms located in the main migration path for Fraser River sockeye salmon. Since 2003, there has been a significant decline in the number of farms reporting BKD in BC Fish Health Area 3 (the main migration route for Fraser River sockeye salmon) with an average of 6 farms per year since 2006. In 2006, 3 farms from northern Queen Charlotte Strait, 2 farms from the Broughton, and 1 farm the Sechelt area reported BKD fish health events. Of the 20 cases of BKD reported between 2007 and 2009, 17 were from farms in the Jervis/Sechelt/Salmon inlets area with only 1 farm in each of the 3 years being located within the main migration route for Fraser River sockeye salmon. Overall, the incidence

of diseases in farmed salmon that would be classified as high risk to sockeye salmon is very low and do not pose a significant risk.