

Cohen Commission technical and scientific research projects

Project 1 – Diseases and parasites – A veterinary scientist will take a broad view of sockeye diseases and parasites that span the life cycle from egg to adult, and will evaluate the full spectrum of diseases that occur at all life history stages.

Project 2 – Effects of contaminants on Fraser River sockeye salmon – The researcher will prepare an inventory of aquatic contaminants in the Fraser River in relation to the distribution of sockeye Conservation units. This will include an evaluation of pulp mill effluent contaminants, non-point source contaminants, endocrine disruptors and other contaminants, including sewage discharges from the Lower Mainland and other urban centres in the Fraser Watershed.

Project 3 – Fraser River freshwater ecology and status of sockeye salmon Conservation Units – The researcher will investigate several aspects of Fraser sockeye ecology, including the status of sockeye Conservation Units, a review of industrial and urban impacts on freshwater ecology and salmon life history, and an expert assessment of potential impacts from industrial and urban activities on Fraser River sockeye during the past 30 years.

Project 4 – Marine ecology – The researcher will review the marine ecology of Fraser River sockeye salmon to determine whether there are oceanographic factors that can explain the reduction in short-term and long-term Fraser sockeye productivity.

Project 5 – Impacts of salmon farms on Fraser River sockeye salmon The researcher will evaluate the linkage between salmon farm operations and Fraser sockeye spawning returns – past, present, and future. This research will consider the impact on Fraser sockeye of sea lice exposure, farm wastes that affect benthic and pelagic habitat quality, Atlantic salmon escapees, and disease (including IHN).

Project 6 – Data synthesis and cumulative impact analysis – The researcher will synthesize information contained in the other contractors' technical reports, to address cumulative effects and to evaluate possible causes for the decline of Fraser River sockeye salmon.

Project 7 – Fraser River sockeye fisheries and fisheries management – The researcher will investigate Fraser River sockeye fisheries harvesting (First Nations, commercial and recreational) and fisheries management (pre-season forecasting, in-season and post-season run-size abundance estimation methods and escapement enumeration methods), will analyze historical performance of the in-season assessment process, will evaluate the scientific basis for determining escapement targets, will evaluate the extent and impact of any over-

harvesting since 1985, and will summarize the current conservation status of the Cultus Lake sockeye population.

Project 8 – Effects of predators on Fraser River sockeye salmon – The researcher will prepare a description of predation on sockeye salmon across the geographical range of the population, focusing on marine mammal predation on adults and smolts. The contractor will also evaluate freshwater fish predation on alevins, fry and smolts, and marine fish predation on smolts, sub-adults and adults.

Project 9 – Effects of climate change on Fraser River sockeye salmon: literature compilation and analysis – The researcher will compile and review all published evidence for climate change and climate-related effects on sockeye salmon in freshwater and marine habitats across all life stages, looking specifically for evidence of the effects of climate-related variables such as temperature, flow, salinity, pH, currents, primary productivity and species interactions on Fraser River sockeye survival, behavior and distribution.

Project 10 – Fraser River sockeye salmon production dynamics – data compilation, literature review, and reporting – The researcher will, to the extent possible, undertake basic statistical analyses of abundance and productivity by Conservation Unit; will review previous research and data on sockeye cyclic dominance, including Fraser and non-Fraser sockeye populations (including a review of the relationship between sockeye run failures and timing of sockeye cyclic dominant runs); and will summarize the frequency and effects of over-escapement on subsequent productivity and abundance of adult recruits.

Project 11 – Fraser River sockeye salmon: status of DFO science and management – The researcher will prepare an analysis, including an economic analysis, of DFO activities in Fraser River sockeye management since 1985; will present DFO science and research expenditures related to Fraser sockeye since 1985; and will undertake an analysis to evaluate DFO's ability to meet its stated management objectives relative to Fraser sockeye since 1985.

Project 12 – Sockeye habitat analysis in the Lower Fraser River and the Strait of Georgia – The researcher will prepare a habitat inventory for sockeye habitats in the Lower Fraser River (below Hope) and identify human activities that could affect them; analyze Fraser Estuary development, including larger vessels, proposed expansion of the Vancouver International Airport Fuel Delivery Project, development of ports, bridges and damage from dredging; describe human activities in the Strait of Georgia that could negatively affect sockeye salmon; evaluate Coastal Zone protection strategies related to shoreline development, shipping, aquaculture and oil tanker traffic; provide a synopsis of water quality conditions in the Strait of Georgia along the sockeye migration routes; and quantify sockeye food abundance in the Strait of Georgia, in relation to the potential for food competition and limitation.