Benchmark Analysis Review Workshop

MEETING OUTCOMES

Subject:	Reviewing a revised sockeye benchmark analysis
Location:	Terrace Best Western Inn
Hosted By:	Pacific Salmon Foundation (PSF)
Attendees:	*See attached workshop participant list*
Meeting Date:	April 4th, 2012; 9:30am – 4:30pm

The Pacific Salmon Foundation hosted a technical workshop in Terrace, BC on April 4th, 2012 to present a revised benchmark analysis for Skeena sockeye Conservation Units (CUs). The following table summarizes key elements of the discussion as well as some of the outcomes from this workshop:

Discussion Item	Summary of Discussion
Overview of PSF's benchmarks work (Katrina Connors)	PSF provided an overview of their involvement in benchmark development for Skeena Conservation Units (CUs). PSF clarified that their role is restricted to developing the technical framework and analytical tools for developing various benchmark options for Skeena salmon. PSF emphasized that they will not be setting or deciding upon benchmarks for Skeena CUs as that requires consultations (led by DFO) with First Nations and other affected parties. The bulk of PSF's efforts have been and will be focused on the technical analyses required to implement Strategy 1 of the Wild Salmon Policy and providing opportunities to share and receive feedback on this work with the Skeena community. The April 4th workshop was intended to provide an opportunity for Josh Korman (Ecometrics Research) to present a revised benchmark analysis, receive feedback on his work and promote open discussion on his analysis.

PSF is currently considering three other areas of work in addition to Josh's analysis. These include: 1) building an in-river run reconstruction model that will includes details on the location and timing of in-river fisheries, 2) generating 'snapshots' or summary documents for each Skeena CU that provide core stock assessment information (e.g., age-structure data, lake productivity) and 3) developing a management strategy evaluation (MSE) tool that will help people explore the trade offs between yield and conservation under varying levels of harvest.

PSF will continue to keep people informed of their work including any changes or improvements made to the analyses through future workshops and as well as through updates provided on our website and regular email updates. |

DFO update (Dave Peacock)	In December, PSF contracted Karl English (LGL Ltd.) to assemble the available data sets of escapement, exploitation rate and age structure for all North and Central coast CUs. This project pulled together critical stock assessment information for Skeena CUs and developed a database for efficiently examining escapement by CU. DFO noted that in the coming months they will be performing a gap analysis of the core datasets complied by LGL Ltd and comparing these estimates with the target escapement goals outlined in DFO's *Core Stock Assessment Program*.

DFO also highlighted the need to review current monitoring efforts by CU as the *Core Stock Assessment Program* has not been reviewed since CUs were developed for the Skeena.

DFO informed the audience that a report on draft benchmarks for all CUs in the Nisga'a system is currently being developed and that this report will be shared when it is available (in about a month's time) as there are some parallels between the Nisga'a system and efforts currently underway in the Skeena region. DFO is also going to undertake benchmark discussions with a Rivers and Smith Inlet working group. DFO noted that this group may need to be expanded in the near future to include a wider representation of interests (e.g., the commercial sector).

Some questions were posed to DFO around the process of setting benchmarks for Skeena CUs. Dave explained that discussions related to the development of Skeena benchmarks are ongoing and that future discussions will be based off the technical papers submitted to the Canadian Science Advisory Secretariat (CSAS), including Josh Korman's work. DFO will be coordinating all of the technical inputs related to benchmark development and the Department is optimistic that there will be a reasonable and natural convergence on benchmarks in the Skeena watershed as there has been in other areas of the Province. Other concerns were raised on the perceived exclusion of FSC fish from the 'conservation' lower benchmark and on the possible interpretation of the lower benchmark as a minimum spawning requirement that can never be fished below by First Nations for FSC fish. Dave assured people that the lower benchmark will be consistent with the WSP, which states that the lower benchmark should be established at a level of abundance high enough to ensure that there is a substantial buffer between it and any level of abundance that could lead to a CU being considered at risk of extinction by COSEWIC. This buffer is not meant to include FSC fish. |

Revised benchmark analysis (Josh Korman)	Josh Korman explained how the benchmark analysis was conducted and presented some key findings from his analysis as well as some of the limitations and uncertainties. Brian Riddell (PSF) clarified that the examples presented by Josh in his analysis are for discussion purposes only (e.g., SGen2 was included for comparison purposes with SGen1) and encouraged people not to get too fixated on the benchmark examples presented in his report.

One key limitation that Josh highlighted was that out of the 31 sockeye CUs in the Skeena Watershed, stock recruit data (ie., escapement and recruitment data) were only available for 15 CUs. The remaining 15 sockeye CUs had escapement data only. Other limitations included the limited availability of age-structure data for the majority of the CUs.

Concerns were raised that the analysis was limited to a short period of time and only utilized data from 1980-2010. Some people thought that these years did not reflect years when harvest rates were higher (prior to 1980) and that the inclusion of data prior to 1980 would be helpful and may help to explain why stocks haven't recovered in one or two generations under the more recent lower harvest rates. Josh indicated that the slow recovery could be due to an unproductive stock or low marine survival rates over the few last years and not necessarily due to overfishing. It was recommended that, where available, historical data prior to 1980 would be incorporated into the analysis. It was also noted that the CU snapshots would be capturing and presenting all available escapement data (prior to 1980) as well as any other auxiliary information, all of which will paint a more complete picture of sockeye stock dynamics.

Josh's analysis suggested that productivity is generally declining through time. However, this decline was not significant, with only 2 lakes showing a clear decrease in productivity. While many sockeye lake CUs showed a negative trend in productivity, there is considerable scatter and uncertainty in the trend. It was noted (Brian Riddell) that the results were based on only 15 data points and by incorporating data prior to 1980 we may see a more pronounced decline in productivity. Josh's analysis also suggested that the historical harvest rates have been conservative, with a lower exploitation rate on weaker stocks and higher exploitation rate on stronger stocks, indicating good overall management. Josh clarified that while reducing the harvest rate may increase the probability of recovery, the poor recruitment observed in recent years is likely due to a reduction in ocean productivity.

The results obtained for Babine Lake raised questions surrounding the inclusion of enhanced populations in the analysis. Some felt that different benchmarks should be developed for the wild Babine stocks. Distinguishing between the wild and enhanced stocks is said to be a challenging task and careful thought needs to be given to how wild Babine stocks are treated in the analysis. Josh also explained how he used the Babine system to explore the effects of using average age-composition |

	data versus age-specific data. Josh found different results between the analyses done with the two different types of age composition data. The differences were neglible for the Nass system and more pronounced for the Babine system. Some people suggested that the difference in the Babine system was because of the inclusion of prominent disease years. It was suggested that the disease years be removed from the analysis.
	Others raised concerns around the language used in Josh's report, specifically around the use of the term 'overfishing' and the definition of 'red zone' and 'benchmarks'. Josh agreed that he would include definitions of key words used in his report. It was also requested that Josh include a disclaimer in his report that states that his analysis has not been approved by stakeholders.
	Over the next several months, Josh will be repeating the analysis for the remaining Skeena salmon species using map-based estimates of carrying capacity. He will also be examining the effects of bias due to measurement errors, non-representative sampling and utilizing a fixed age-structure. He will also be 'tweaking' the data and revising the analysis as new information becomes available (e.g., data on in-river harvests, revised exploitation rates, inclusion of additional years of data, etc).
Skeena sockeye juvenile assessments and possible status benchmarks (Steve Cox-Rogers)	Steve described the work he has been doing using juvenile sockeye assessments to identify possible status benchmarks. Please see his Power Point presentation for additional information.
Next steps (Katrina Connors)	Katrina summarized the next steps based on feedback received during the meeting. These included: 1) incorporating historical data prior to 1980 in the analysis, 2) building an in-river run reconstruction model to account for in-river sockeye harvests, 3) developing CU snapshots that include key information for Skeena CUs, 4) modifying the analysis to exclude disease years in the Babine system, 5) including a disclaimer in Josh's report that says that the report has not been approved by stakeholders, 6) examining the impacts of bias in measurement errors, non-representative sampling and utilizing a fixed age-structure in the analysis, 7) ongoing tweaking of the data, and 8) undertaking similar analysis for the remaining Skeena salmon species.