

RIVERS SMITH SALMON ECOSYSTEMS PLANNING SOCIETY

SUMMARY OF MEETING

November 27, 2007

9:30 a.m. to 4:00 p.m.

Pacific Salmon Boardroom

1682 West 7th Ave.

Vancouver

Present:

Rick Routledge, Peter R Johnson, Lance McGill, Bob Bocking, Dave Peacock, Eric Peterson, Doug McCorquodale, David Stevenson, Misty MacDuffee, Ted Walkus, Karl Wilson, Julian Sturhahn, Sandie McLaurin, Mike Rough, Brian Hunt, Desiree Tommasi

1. Julian Sturhahn gave a Stock Assessment Report for the Central Coast: Recent years have been characterized by considerable uncertainty around salmon returns with disappointments outnumbering success stories throughout the Pacific Region. Common underlying theme regardless of kind of salmon; if it went to sea in the spring of 2005, subsequent marine survival is almost certain to have been abnormally low. It is apparent that the food chain in near shore waters was not function anywhere near normal levels.

First indications of this were observed with the poor 2006 returns of Pink salmon coast wide through to Central Alaska (.25 to .33 of expected return). Relatively high returns in 2004 yielded only a small fraction of expectation in the Central Coast in 2006.

2006 returns of Coho salmon in Southern BC amongst poorest recorded (worst since 1975 in BCI) and 2008 could be similar.

2007 returns of sockeye salmon suffered wide-spread failures (much poorer than forecast) in BC, including Barkley Sound, Fraser River, and Skeena River (impacts Age-5's in 2008). Returns to Central Coast sockeye showed a similar collapse in returns of age-4 adults. In the case of Smith Inlet sockeye, the return of 19,100 included only a very small age-4 component estimated at 12% by scale ages. This is emphasized by the fact that this poor return of 4's came from a decent adult return of 179,500 sockeye in 2003. We expect that the 5-year old sockeye returning from this brood year will be equally weak. Rivers Inlet 2007 sockeye return is estimated at 100,000 and is comparable with the recent 5-year average of 122,000.

2007 returns of Chinook salmon failure of 4.2 age-class. This was significant in WCVI stocks, Cowichan River, Interior Fraser spring and summer Chinooks (impacts Age-5's in 2008). The Cowichan River record low escapement of under 1000 is less than 10% of target and suffered a double whammy as the poor early marine survival conditions impacting outmigrants in 2005 were compounded by a power failure at the local hatchery resulting in a total loss of 2004 return production. Continuing low returns to this indicator is likely to result in further protective management action. Currently the recreational fishery off the lower portion of Quadra Island is closed annually during the period of documented Cowichan chinook migration through this area (mid July-early Sept).

There are indications from some areas of BC along with the Oregon-Washington coast that marine conditions improved somewhat in the spring of 2006. Black creek is a southern Strait of Georgia wild coho survival indicator located on eastern Vancouver Island and is showing an encouraging return in 2007 from juveniles outmigrating to sea in the spring of 2006. Roughly 4600 coho have been counted at the fence to date from 125,000 smolts leaving in 2006. For comparison, only 600 adults returned in 2006 from 50,000 smolts leaving in the spring of 2005. This suggests a significant improvement(3x) in smolt to adult return rate. Improvements in coho returns have been observed elsewhere in BC.

Dave Peacock commented that Chinook numbers overall are down. There were disastrous chum returns especially on Queen Charlotte Islands. There were less than 100K returning to the Skeena which is one-tenth to one-twentieth of the average on the Skeena/Nass systems. There is a need to review the IFMP to ensure a more conservative approach to commercial fishing plans. There will be no commercial fishing in areas 9 & 10.

2. Early Marine Survival Report:

Rick Rutledge presented his 2007 report on the research into Early Marine Survival in Rivers Inlet. We have now completed field work for the 2007 season, and have achieved the following main objectives:

- We obtained a mix of daily and weekly observations on inlet conditions in the lead-up to the juvenile sockeye salmon migration.
- We have analyzed the chlorophyll measurements, and are beginning to assess the results of laboratory analyses of plankton and nutrient sample that we are currently receiving.
- We continued to obtain data on local weather conditions at two sites in the inlet.
- We are nearing completion of the first version of the hydrodynamic model.
- To obtain direct observations of surface currents, we deployed drifters in the inlet as opportunities became available.
- We ran a designed experiment on horizontal plankton tows, and are currently awaiting the results of the laboratory analyses.
- We reinstated the purse seining for juvenile sockeye salmon during their late spring migration down the inlet.
- We completed the analysis of a pilot version of an experiment on salinity preferences for juvenile sockeye salmon.

In addition, one paper associated with Phase I of this project has been printed in the journal, *Limnology and Oceanography*, a second has been submitted, and a third is nearing completion. Furthermore, Ms. Seana Buchanan successfully defended her M. Sc. thesis in the past year, and has now graduated.

Hydrodynamic Model: The first working version of the hydrodynamic model is nearing completion. This will provide a two-dimensional moving picture of the circulation and mixing of inlet waters. We shall soon be able to compare model predictions to observations on surface water flows from the drifter deployments.

Juvenile Sockeye Salmon Sampling: Preliminary analyses suggest that the sockeye salmon did not grow significantly during their migration down the inlet. We await the laboratory analyses of plankton samples and stomach contents to see if this was accompanied by a lack of food.

Juvenile Sockeye Salmon Salinity Preferences: Our pilot study on salinity preferences demonstrated that the small sockeye salmon consistently preferred relatively low salinity levels. In addition, we experienced considerably more difficulty in keeping the sockeye salmon alive if they were caught near the inlet mouth. This suggests that early marine survival for these fish will have been low this year, and provides further evidence that the inlet plays a critical role in determining marine survival.

Thus we have found direct evidence supporting the importance of inlet conditions in early spring to the marine survival of juvenile sockeye salmon migrating down the inlet in late spring. A late phytoplankton bloom appears to disrupt food production for the late-spring juvenile sockeye salmon migration.

Rick concluded that 2007 was a disaster for juvenile sockeye; there will be serious marine survival problems for the this juvenile age group due to the lack of adequate plankton populations in the Inlet . He expressed his appreciation to the Tula Foundation for funding the project and to the Salmon King Lodge for accommodation provided during the project. Dave Peacock pointed out that there was a PNCIMA report giving an ecological overview of the area from Campbell River to Alaska. It includes some information on the importance of plankton populations in the study area. This paper is available through the DFO Web page.

3. Wannock River Hatchery Feasibility study

David Vincent gave a report on his recent examination of 4 sites on or adjacent to the Wannock River for the purpose of establishing a hatchery. Don Sinclair was the project biologist. This project was funded by Tony Allard of King Salmon sports fishing resort. The 4 sites were: Meadowse Creek, Nicknaquet Creek, Oweekeno Village and the old Chinook hatchery site east of the village. The report concludes that a successful hatchery utilizing recirculation technology during incubation can be built at Owikeno. The preferred site, at this time appears to be the old Chinook Pilot Hatchery location that has good access and a proven water supply. If a facility at in the Village is contemplated, it is recommended that the water supply be pilot tested since the water quality testing suggests that there may be challenges. The old Chinook site will be the least expensive and have the least risk. This site needs some clean up from the previous hatchery operation. The final report will include an estimate of construction and operating costs.

4. Rivers 2007 Echo Sounding Report

Bob Bocking gave a report on the 2007 Echo Sounding project in Rivers Inlet. The primary purpose of the project was to test the use of hydro acoustics to index the returning abundance of Owikeno Lake sockeye in Rivers Inlet as a possible in-season management tool. Acoustic data was collected All acoustic data were collected using a Simrad EK 60 120 kHz Echosounder. A total of 20 surveys were conducted at night between July 19 and August 9 following pre-determined grid pattern. Not all transects were covered all the time due to weather or equipment malfunctions. The attempt to catch fish with a seine net to determine species composition was not successful. The sockeye run was late this year compared to its historical timing. The estimated high count was approximately 150,000 fish on August 1.

There is no clear relationship between the annual clear stream index and the echo sounding estimates. The following is from the final report: “The 2007 peak daily abundance estimate for sockeye did not compare well with the escapement estimate provided by DFO in 2007, but given the lack of a relationship between historical echosounding estimates and historical escapement estimates the 2007 discrepancy in the estimates is not surprising. The increase in the maximum daily abundance estimate from 2006 to 2007 (about 35,000 fish in 2006 and about 150,000 fish in 2007) coupled with the lack of a significant change in the clear stream index counts (107,700 to 100,000 in 2006 and 2007, respectively) is puzzling and begs the question, what may have contributed to potentially inflated echosounding counts? We suggest the sockeye counts may be exaggerated by the presence of other salmonid species in the Inlet during the survey period, particularly pink salmon. As discussed above, attempts to collect species composition data to inform the results of the acoustic surveys were unsuccessful. However, escapement estimates for pink salmon in Area 9 indicates a sharp increase over the previous year (Figure 7), which may have contributed to some of the detected targets assumed to be sockeye salmon in the Inlet in 2007. Low escapement estimates for pink salmon in 2006 compares well with the sockeye relative abundance estimates reported in 2006 (Johnson et al. 2006).”

There is still no way of validating accurately the escapement numbers of sockeye. This project was submitted for funding to the Northern Boundary Fund for 2008 but was not accepted as there is no commercial fishery and so no need for an in-season abundance index. Bob’s report concluded that “We recommend continued use of echo-sounding surveys in Rivers Inlet for estimating relative in-season abundance of returning sockeye. Systematic and increased sampling effort by the purse seine boat in future years would benefit the project by providing important run timing information and a more robust species composition data set that would enrich the interpretation of the acoustic data. The echo-sounding surveys coupled with the in-river estimates will strengthen our understanding of Rivers Inlet sockeye stock dynamics and improve in-season stock management should commercial harvesting occur in future years.”

There was some discussion about pursuing funding for Didson hydroacoustic equipment to measure sockeye escapement on the Wannock. It could prove a useful tool for more accurate escapement numbers. There was no consensus on pursuing this as a priority.

5. Long Lake Chinook Escapement Study

Doug McCorquodale gave a report on the Long Lake Chinook mark recapture project. The project was a partnership between RSSEPS, the GNN and DFO. The primary objectives of the study include:

- The enumeration of adult chinook salmon using mark-recapture methodologies
- The comparison of mark-recapture enumeration results against the Docee Enumeration Fence results, in an attempt to determine if fence counts can be relied on as an enumeration tool for chinook.
- The tagging of adult chinook with radio transmitters in an attempt to determine watershed distribution and habitat utilization

In 2007 there were 95 chinook counted through the Docee Fence. 46 of 50 radio tags were successfully applied. Data was collected on length, sex, age, and DNA. High water conditions made collecting carcasses by a dead pitch very difficult. Only one single tagged fish was recovered out of a total of 28 carcasses. Radio receivers were set up to track fish

movements. Number one receiver recorded zero fish, number two receiver recorded 3 fish and at number three receiver 23 fish were recorded. There was some discussion on the location of the missing radio tags.

6. Sockeye Enhancement Evaluation Report for 2006

Conservation enhancement of sockeye salmon from seven tributaries of the Owikeno Lake Basin, including the Inziana River, Amback River was initiated in brood year 2000 to support a Rivers and Smith Inlet Sockeye Recovery Plan. The intent of enhancement was to augment the wild stock which had experienced declines during the 1990's with a dramatic drop in escapement in 1999 to 3,600 fish, a figure well below the LRP of 30,000 (LRP = Limit Reference Point - the point at which there could be danger of extirpation). The targets for enhancement were based on the minimal number that could insure continued survival and not for stock re-building. As well, the intent was to refine fish culture techniques in the first several years so that more intensive intervention could occur should stock decline continue or more rapid re-building be desired. The estimated annual adult production from the enhanced fish was expected to be about 2,750 (using a conservative bio-standard of .5% survival for 550,000 fry released).

The recovery plan recommended that enhancement be evaluated to determine its efficacy as a tool for stock recovery and/or rebuilding, thus guiding decisions about future program direction and allocation of resources. The initial evaluation project began in 2004 when the first returns of thermal marked fish from the 2000 brood (age 4 fish) were expected.

Evaluation activities were continued in 2005 and again in 2006 allowing survival estimates to be completed for brood 2000 and 2001 to age 5.

Sandy presented tables to show results of the evaluation of the otoliths and there was some discussion of the results.

Evaluation of the enhancement program for broods 2000 and 2001 Inziana and Amback Rivers has been impacted by low incidence of marked fish in the recoveries/samples. This is likely due to underestimating the egg to fry survival in wild fish (so lower incidence of marked fry than initially estimated) and the return to spawner ratio, both used to calculate sampling level needed in return years. The result is that recovery of sufficient samples to meet a 20% error rate was not achieved in any of the three sampling years, even though almost half of the estimated escapement was sampled in the Amback in 2006. What this means is that while the information will be useful, it has to be viewed in light of a wider margin of error. In retrospect, it would have been useful to have considered the potential for dilution of marks in the design of the program and have developed an alternate strategy.

Use of thermal marks was cost effective in terms of mark application for a release strategy of small fry, but proved very costly in terms of mark recovery, necessitating collection of otoliths from large numbers of fish (manpower) and processing and reading the otoliths at \$8 per sample. A visible external mark (fry AD clip) may have made the evaluation easier and less expensive overall.

The data from both the 2000 and 2001 broods Inziana and Amback Rivers seems to indicate that enhancement of Owikeno Basin sockeye utilizing the strategy of releasing small fry after minimal rearing did not provide significant gains in survival to adult over wild fry. The data also implies:

- ➔ that survival to fry of wild fish could be much higher than regional bio-standards
- ➔ there is heavy “selection” that occurs on enhanced fry after they are released (how much of this that occurs in freshwater or marine is not known)

If there was a desire to increase production from enhancement a review of the biological strategy would be necessary and options such as release of larger fry or smolts considered.

There was some discussion of what was learned from the project. It was pointed out that the project demonstrated that we can preserve genetic material through minimal intervention and that more fish will be needed for better results (this would increase returns but not survival).

Eric Peterson asked if this kind of evaluation project was ever economical. Dave Peacock replied that the Alaska situation has produced some results from low budget investments, (ie Sitka example) and that there is some incremental benefit from these releases.

Sandie pointed out that in this project 92% of eggs were fertilized and 90% of fertilized eggs survived to fry. The question was asked how did the wild fry do [in terms of survival] from the enhanced fish. We don't know the answer to that yet.

7. Sport's fishery update

Mike Rough gave a report on fishing results for Blackgold lodge:

- Chinook and coho were targeted. Normally fish coho at the mouth of the Inlet. In 2007 fishing effort focused further into QCS. Generally they caught more coho and less chinook. Could have been due to the change in strategy/location.
- Didn't see many pinks

Ted Walkus/ Salmon King Lodge(?)

- Fished chinook from Draney upward
- Good numbers and size (up to 52 lbs) but they were late arriving at the head of the inlet
- Still chinook in the upper inlet at the beginning of Sept
- Also noted very few pinks, surprised at the numbers in Chuckwalla/Killbella

Egg take on Chinook (Ted)

- Joined the team late and left early
- Water was high which made things difficult
- There seem to be lots of fish, but some were spawned out
- About 200 fish were captured, 4 or 5 were recaptures

8. Update from Coordinator:

- Dave Stevenson gave a brief report on the Coordinators position. The Tula foundation funded this position in 2007 and has agreed to fund it again in 2008. We are grateful to the Tula foundation for this continued support. Several other sources of funding have been pursued but so far no other foundation has expressed an interest in the work of RSSEPS. David will pursue funding from the Living Rivers Fund. This year we received funding from the Northern Boundary Fund for the Rivers Echo Sounding project, and the Long Lake Chinook Mark Recapture project. The Tula Foundation provided funding for Rick Routledge's Early Marine Survival research and for the Sockeye Enhancement Evaluation project. Tony Allard of the King Salmon Resort provided funding for the Wannock River Hatchery Feasibility Study. We have had two projects approved for stage 2 of the

application process for the Northern Boundary Fund: the Neekite Chum Mark Recapture project and a proposal to produce an engineer's hatchery design for the Wannock Chinook and Coho.

Our financial records are being reviewed by the same auditor as last year. Her report will be available at our AGM which is scheduled for February. There has been a change in our Management Committee. Bruce Burrows is no longer with the Wuikinuxv Nation so we await a replacement for Bruce. There is a need to re-visit the Recovery Plan to evaluate our progress and identify other areas of concern.

There was some discussion of the merits of the Nekite Spawning Channel. Ted felt that the commercial value of the stocks should not outweigh the conservation status of the stocks when considering funding. Dave Peacock thought this project might be premature for NBF as its not a production issue yet and that it is good candidate for next year's NBF round of funding.

9. Workshop on the implications of Lake Core Analysis

Misty is planning a workshop which will bring together scientists to discuss the paleontological data found in cores from various lakes. There is a lack of consensus on the the interpretation of this data. She will keep us informed of the time and place of the workshop.

10. Wannock Chum

There was a discussion on the disappearance of the Wannock Chum stock. There was a healthy population in the river until the 1990's. Decline in the population is suspected of being related to the big mud slide of 89. Efforts to find Wannock Chum in the last few years have not been successful. Concern was expressed that we need to keep making an effort to find some of these remnant fish. Julian presented a dendogram of chum genetics but cautioned the data was based on a sample of only 11 fish. The possibility of transplanting a stock from another system was discussed. From a run timing perspective, the Clyak and Chuckwalla Chum are similar, but genetically they are not similar so this is not a biologically viable option for recovery. Other systems such as the Walkum and the Takush have different run times. Wannock chum are likely a unique CU and warrant special consideration even if not formally recognized. It was agreed that we need to increase our effort to find them. There may be some money to do this through the AFS budget. Julian agreed to look and see how close the Wannock chum was to the Nimpkish Chum. We will continue to discuss this at our next meeting in February 08.

11. Rivers Inlet Coho:

Sandie gave a report on her submission to the Northern Boundary Fund on the Rivers Inlet Coho. The main objective is to evaluate the harvest distribution for Rivers Inlet coho as there has never been a cwt application for this area. A secondary benefit will be increased production from this stock.

This project involves egg takes from the Chuckwalla and Kilbella Rivers in Rivers Inlet, incubation and rearing to smolt and cwt marking at Snootli hatchery in Bella Coola, final rearing and release in Rivers Inlet. The initial egg targets would be 30,000 eggs from each to

insure a 25,000 smolt group (for CWT marking and tracking of recoveries through marine fisheries).

The approach would be to monitor two stocks of coho so spawn timing and location could be determined more exactly, then when appropriate get field crews out to the sites immediately to collect gametes and transport them to a hatchery facility (Snootli Hatchery in Bella Coola) for fertilization, incubation, ponding and rearing/markings.

The coho would be reared, marked and kept to a pre-smolt (10-15gms) average size before being transported back to Rivers Inlet to netpens in the estuaries of the rivers of origin for final rearing and release.

The project would also provide more information about stock size, spawning distribution and timing, disease profile, baseline DNA and length/wt. data. It is anticipated the program would operate for three or four years. This year Jim Rough of Black Gold Resort and Sandie went into Johnston Creek and took some coho eggs to kick off the project.

12. Wild Salmon Policy:

Dave Peacock informed the meeting that the Rivers/Smith watersheds were not going to be an official WSP Pilot Project. The Fraser River watershed will be the only one officially in DFO's WSP planning process. There was some discussion on what this meant and the possibility of proceeding under our own initiative to develop the WSP mandate. Dave Peacock said he was waiting for a bit more info on the Conservation Units which would be produced as PSARC paper, to come out of DFO. Misty suggested that we should proceed on our own rather than wait for the formal WSP process to unfold. Bob Bocking suggested that we revisit our Recovery Plan and re-examine the status of the stocks, the status of the habitat, and the over-all health of the ecosystem. It was agreed that David and Misty and Bob would meet before the next RSSEPS meeting in February to identify some next steps to move this project forward.

The meeting was adjourned at 3: 00 p.m.