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MEMORANDUM

TO: Ritchie Graves, NOAA

FROM: Michele DeHart

DATE: November 30, 2011

RE: Response to NOAA comments on the Draft 2011 Comparative Survival Study Annual Report

Attached is the CSS Oversight Committee response to NOAA comments on the Draft 2011 Comparative Survival Study Annual Report. We have responded to each comment in the attached document. The original NOAA comment is followed by the response in italic font. We appreciate the time that NOAA invested in reviewing the draft report and providing helpful constructive comments.

Comments on the DRAFT Comparative Survival Study 2011 Annual Report
NMFS Hydropower Division
October 14, 2011

General Comments

The document refers to a 2% minimum SAR goal 40 times in the document. Given the weight the document gives to this minimum SAR level, the multiple factors that can significantly influence these estimates (dams, sea lions, fisheries, straying, etc.), and the uncertainty with respect to where the 2-6% goal was meant to apply; we suggest that the CSS report provide SAR estimates to the Columbia River mouth and Bonneville Dam, as well as to Lower Granite Dam (or Rock Island for Upper Columbia Stocks) for the various study groups.

Response: *The reporting of SARs is dependent upon adequate mark group releases and adequate detection capabilities for adult and juvenile salmon and steelhead migrants. The development of detection capabilities and mark group sizes must be balanced against detrimental handling and marking effects and other funding priorities in the Basin. Development of new adult detection capabilities should be considered as part of an overall plan that is prioritized in terms of management decisions. The CSS Oversight Committee utilizes the 2%-6% SAR goal because it has been established by the NPCC. This goal provides a point of relative comparison from year to year for the CSS as a life cycle monitoring program. It is a helpful reference for the fishery managers in considering the resulting data. The CSS does report SAR to Bonneville Dam in Chapter 6. In addition, Chapter 6 provides SARs and ocean survival rates (S.oa) to both Lower Granite Dam (or uppermost dam) and the Columbia River mouth for Snake River wild spring/summer Chinook and steelhead for the 1964-2008 migration years (Figures 6.1 and 6.4; Tables 6.32 and 6.33).*

Analysis and discussion of patterns in overall SARs should also describe and present ocean indices (e.g., PDO and /or ENSO) that influence ocean survival and adult returns.

Response: *The discussion of Overall SARs in Chapter 6, includes discussion of first year ocean survival rates related to freshwater survival and passage conditions. The chapter discusses recent published journal articles that suggest that factors affecting mortality in freshwater partially affect mortality during the marine life stage. Evaluation of SARs and survival by life stage is discussed in Chapter 6 as a future study direction for the CSS.*

Chapter 1

Top of page 7. "All of the Chinook salmon evaluated in the CSS study exhibit a stream-type life history." This year fall Chinook were added to the report. This statement should be revised.

Response: *This has been modified. The report was edited to identify race (spring, spring/summer or fall) or to use terms consistent with the literature: stream-type, referring to salmon and steelhead which outmigrate to the ocean in their second spring, and ocean-type for salmon migrating to the ocean in their first spring.*

Chapter 2

Page 45 and 46. The survival estimates for Wild Chinook and steelhead for the years 2006 to 2010 presented in Tables 2.2 and 2.4 respectively are much higher than the survival estimates reported in spring survival estimates reported by Falkner et al (2010). A discussion as to why this is the case seems appropriate, since two different estimates for the same fish deserves some attention.

Response: *We disagree. We reviewed the survival estimates in Falkner et al, and the survival estimates are not notably different. NOAA estimates of survival include fish that were marked as juveniles at Lower Granite Dam. Past analyses have shown that there is a bias associated with marking juveniles at Lower Granite Dam. This may explain the lower survival estimates calculated by NOAA. We have attached FPC memorandum #50-08, entitled "Potential for bias in NOAA TIR estimate as a result of tagging at Lower Granite Dam" for reference regarding bias associated with tagging at Lower Granite Dam.*

Chapter 5

Starting on page 126. The stray rate section may benefit from a clearer presentation and discussion of which hatcheries have the highest stray rate.

Response: *The analyses indicate that transportation of smolts is the primary factor affecting straying of adults. Sites of last detection for all hatchery and wild mark groups strays are summarized in chapter 5.*

Page 127. Most adult losses appear to occur in the BON to MCN reach. The CSS report focuses primarily on those fish detected as strays into tributary systems with PIT tag detection capabilities. Analysis relating to the adults that were detected at Bonneville, but which did not reach McNary Dam should be included in the report. We suggest you consider evaluating age at return, migration timing, or other environmental factors such as temperature or flow in this analysis.

Response: *Age at maturity relative to juvenile passage, year affect is presented in Chapter 7. Environmental factors including temperature and spill were included in the analyses of success rates. In these models, including environmental variables, the primary factor affecting stray*

rates of returning adults was transportation as juveniles. Chapter 5 of the report summarizes the last detections of straying Chinook by hatchery group. Chapter 5 also summarizes the stray rate of wild Chinook and steelhead PIT tag groups, showing that transportation as smolts is the primary factor influencing straying of all groups, both wild and hatchery. Migration timing will be considered in future CSS reports.

Chapter 8

Page 189. It is our understanding that the method for determining the abundance estimates for naturally produced Snake River fall Chinook at Lower Granite Dam might be altered. This could affect recent years of data presented in Figure 8.3. If this occurs this figure (and accompanying text) will need to be revised in future years.

Response: *The CSS monitoring and analyses is adaptive, dynamic and responsive to changes in management decisions and analyses. The public regional review process is a valuable tool in receiving comments and recommendations which allow the analyses to adapt to new methodologies and analyses.*

Page 192. Migration timing differences between warmer (Snake River proper) and cooler (Clearwater River) should be noted, as they greatly influence the generic distributions that are depicted in Figure 8.7 and discussed in the related text. Suggest showing migration timing plots of PIT tagged fish from these release locations (wild and hatchery).

Response: *Generally, production hatchery subyearling Chinook migrate out relatively rapidly whether they were released in the Snake River or the Clearwater River. Size and date of release have had a greater effect on passage timing than river temperature for hatchery origin fish. The apparent passage and timing distribution differences referred to in the NOAA comment must be considered with caution. The available PIT tag data for wild Clearwater and Snake River fall Chinook is unlikely to represent the actual complete passage timing and distribution of fall Chinook because marking does not occur over the entire migration distribution. Marking of wild/natural subyearling fall Chinook in the Clearwater and Snake Rivers is affected by the ability to catch fish for marking at a markable size. Juvenile fall Chinook are captured by beach seine which is affected by river flow. Beach seine sampling can only occur in the Clearwater River at flows near or below 20 Kcfs. This typically occurs toward the end of June so that marking can only occur late in the migration season. Thus passage timing of PIT-tagged fish is affected by the ability to mark across the entire migration. However, in the figure referred to, wild fish timing has little effect on overall passage timing at Lower Granite Dam which is driven primarily by the timing of hatchery releases. The primary objective of figure 8.7 that was to show that overall passage timing of fall Chinook has been shifted to earlier in the year as the result of the increased numbers of fish in hatchery releases occurring earlier in the year.*

Page 194. Paragraph above Table 8.3 should indicate that court ordered spill increased summer spill levels at the Snake River transportation collection projects (LGR, LGS, and LMN); spill levels were already substantial at IHR prior to 2005.

Response*: We have added a sentence that states: The court ordered summer spill program called for spill at collector dams to continue from June 20 to August 31 and for increased spill at McNary Dam.*

Starting on page 195. Chapter 8 goes through a rather exhaustive explanation of the method used to edit the data to fit the CSS methodology. The question is, what was left on the cutting room floor and what could the relevance be of the data not in the analysis? We suggest adding a simple summation, describing what groups of fish were eliminated from further consideration by the methodology. This would allow the reader a more intuitive understanding of which fish the analysis best represents.

Response*: The next step in this analysis will be the development of a simulation to determine what level of holdover probability is acceptable without causing parameters of SAR calculation to be biased. This would contribute to the evaluation of the effect of bias in the LGR starting population on SAR by identifying the effect of holdover probability on SAR.*

Page 205. We recommend also calculating SAR returns to Bonneville Dam as this would substantially increase the sample of adults for the various release groups (reducing confidence intervals).

Response*: We will include SAR returns to Bonneville Dam in future CSS reports.*

Page 205. An analysis of the T0 and C1 data should include depictions and discussion of seasonal trends in return data. This is a key issue for hydrosystem managers with respect to summer transport operations in the Snake River.

Response*: Seasonal comparison of T_O and C_1 SARs to evaluate seasonal trends in transportation should be considered with extreme caution because a true evaluation of transportation of smolts must include the C_0 passage route. A complete evaluation of seasonal trends in smolt transportation requires the development and installation of spillway PIT tag detection capabilities, to allow evaluation of C_0 passage seasonal trends. Comparison, as suggested, of C_1 and T_0 passage routes alone does not truly evaluate the effectiveness of transportation of smolts. Available data indicates that the C_1 passage route adult return is biased low. There are several lines of evidence indicating that delayed mortality associated with*

bypass/powerhouse passage reduces SAR. In a C_1/T_0 comparison the benefits of transportation, delayed mortality associated with powerhouse bypass passage would effectively bias the transportation high and therefore could be misleading regarding the benefits of transportation. The CSS approach to SAR analysis considers all routes of passage. Thus seasonal SARs are potentially misleading when comparing transportation to other mitigation, such as spill to improve passage survival and adult return rate.