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MEMORANDUM

TO: Rich Alldredge, ISAB Vice Chair

FROM: Michele DeHart, Fish Passage Center Manager

DATE: August 31, 2010

RE: Response to "Review of FPC 2009 Annual Report to suggest analyses for further review and to provide comments to improve the Annual Report"

The FPC has included recommendations made by the ISAB on the review of the 2008 FPC Annual Report into the 2009 FPC Annual Report. In the upcoming year the FPC will work on a glossary of terms, as suggested by the ISAB, for inclusion in the 2010 Annual Report. The ISAB comments have been helpful in completing the annual report for 2009 and will be helpful in developing future analyses.

Some of the ISAB comments received on the draft 2009 Annual Report could be interpreted as expanding the scope of the ISAB assignment to review FPC products. The NPCC Program language states that the ISAB will review Fish Passage Center products. For example, ISAB comments referring to ISAB review of Joint Staff Technical Letters and Technical Memorandums go beyond the scope of the assignment to the ISAB. Joint Staff Technical Memorandum and Letters are not the product of the FPC. They are the product of the technical and policy staffs of the fishery management agencies and tribes. These jointly developed documents are included in the Annual Report Appendix because they are an important part of the fish passage management story for that year. These documents are included to illustrate the prevailing passage management issues and discussions and management agencies and tribes views, occurring in that year. There is a critical difference between ISAB review of FPC work products and ISAB review of management and policy decisions of the fishery management agencies and tribes.

Executive Summary:

With reference to spill, the executive summary states, "Spill for fish passage and the additional spill in excess of hydraulic capacity did not cause elevated gas bubble trauma in downstream migrants." It would be more appropriate to state that the 15% action criterion was not reached under the spill conditions experienced in 2009.

Comment noted and the language has been revised to say: "Spill for fish passage and the additional spill in excess of hydraulic capacity did not cause elevated gas bubble trauma in downstream migrants that exceeded the GBT action criteria".

The following sentences are not appropriate for the executive summary, "The disparity between acoustic tag relative survival estimates for juveniles and relative adult return PIT tag SARs by route of passage from research at McNary Dam illustrates that these acoustic studies at the projects do not assess the impact of various passage structures and passage operations on the other life cycle stages such as smolt to adult returns. The acoustic tag data results discussed below are only one component of the decision framework involved in understanding the impacts of dam operations on overall smolt to adult returns." These sentences are a critique of research by others so are not part of the overview of data organized and reported by FPC staff and thus should not be highlighted in the executive summary.

We disagree. The primary purpose of the FPC is to provide technical assistance and information to the fish and wildlife agencies and tribes. Review of research activities, analyses and work of others is a key component of providing information to the fish and wildlife agencies and tribes. This is particularly important when the work done by others is proposed as a basis for fish passage management and operations decisions. At project evaluations of passage, done by others is summarized in the Annual Report. This is because the purpose of the Annual Report is to tell the fish passage story for that year, at project evaluations are an important part of the fish passage story. For example, acoustic tag studies done by others are conducted to evaluate at project performance standards. These evaluations and study results, such as the McNary studies, are proposed as a basis for fish passage operations decisions. The FPC reviewed these studies and provided comments to the fishery management agencies to assist them in preparing for discussions with operating agencies. The disparity between smolt-to-adult returns from route of passage studies and the acoustic tag studies is a critical to future hydrosystem operations management decisions because at the present time managers are relying on acoustic tags to evaluate fish passage performance without considering the evidence that delayed mortality may be associated with specific routes of passage. As technical staff to the fishery management agencies the FPC would be remiss not to advise the fishery managers that disparities in results of work by others were occurring. We believe that it is completely appropriate and expected that the critiques of other work, that are providing the basis of hydrosystem management actions, be included in the FPC annual report because it is part of the FPC tasks, activities and expectations of the fishery managers and tribes. Review of research and results that are put forward as the basis for hydrosystem management decisions related to fish passage are part of the FPC work and therefore are completely appropriate for inclusion in the annual report. Further, the ISAB is somewhat inconsistent in the comments to the FPC. The ISAB criticizes the FPC for including the statements regarding the need to

consider all the information, not just the acoustic studies, since this is "research by others". However, throughout the comments the ISAB requests the FPC to go outside the scope of the FPC Annual Report and deliver information and comment on various topics from several different agencies and entities.

The executive summary also states that, "Multi-year analysis indicated that survival of sub-yearling fall Chinook continued to decline in the Rock Island to McNary reach in 2009. Juvenile salmon survival has declined each year since 2003" (p. xviii, last paragraph). This statement is not supported by the survival vs. migration year data for sub-yearling fall Chinook shown in Figure 37 (page 87). This figure shows that observed survival rates (RI to McN) were higher in 2000 and 2002 than in subsequent years, but no continued decline (trend) is apparent from 2003 through 2008. In 2009, survival could be estimated for only one release cohort; survival was relatively low for this cohort (0.22), but similar to estimates for comparable release cohorts (August 18 to 31) in 2003 (0.28) and 2004 (0.19). The change from 2000-2002 to 2003-2009 appears to be discontinuous, rather than a downward trend; survival has not declined "each year."

We did not intend to suggest a trend in survival. We were trying to describe relatively low survivals in recent years with exception of a single cohort in 2008 relative to the years 2000 and 2002. Temporal trends through years are only relevant in the context of describing broad patterns and were not considered statistical analysis.

As the most often read part of a report, the executive summary, although broadly descriptive, could benefit from a more structured, quantitative, and statistically supported approach to presenting the main points. For example, instead of just reporting that mean survival was higher for one species than another, or one year than another, it would be preferable to make statements such as "Steelhead survival in 2009 (give a number) was higher than the mean survival over the period of 2002-2009 (give a number)" and support it with whatever statistic or test (if any) that might have been used to make this statement. Each statement thus would have more rigor, and would be clearer to the reader what was statistically tested and what was not. The emphasis on this section should be on key results and key numbers supporting those results. Inferences made (if any) could then be summarized in the last few sentences of the summary.

We agree, the executive summary has been restructured to include bulleted points of key findings for the year, including statistical tests.

Spill Management

Editorial Notes
Paragraph indentation is inconsistent in this section, for example see pages 29 and 36.
Noted.

The second sentence in the last paragraph on page 31 needs to be edited.
Sentence re-written.

References cited on pages 31, 32, and 33 should be in the list of references for section A.

References included.

Smolt Monitoring

The statement concerning Ice Harbor conclusions, "It appeared that the BiOp operation (45 kcfs day/gas cap night) provided the best project passage alternative based on the combination of spill passage efficiency and project survival", should be supported by summary statistics in the text.

We added the following survival information and changed the concluding statement to reflect the statistically non-significantly different survivals by treatment.

"Survival for steelhead from forebay to BRZ was 0.911 for BiOp compared to 0.904 for 30% spill; for yearling Chinook was 0.897 for BiOp compared to 0.922 for 30% spill; while for subyearling Chinook was 0.843 during BiOp spill versus 0.842 for 30% spill operations. Given the lack of difference in survival by treatment, it appeared that the BiOp operation (45 kcfs day/gas cap night) provided the best project passage alternative based on the increased spill passage efficiency, relative to 30% spill and equally high project survival."

The following sentences (p. 61) seem inconsistent or convoluted, "In contrast the median travel times for hatchery and wild yearling Chinook released at the Snake River Trap in 2009 were identical. Steelhead, hatchery and wild mark group median travel times were more comparable (than Chinook) for all release locations. Overall there is an indication that, based on median travel time wild steelhead migrate more rapidly than hatchery origin fish.

We changed the text to read as follows: "However, travel times for hatchery and wild yearling Chinook released at the Snake River Trap in 2009 were the exception to the rule, with the two release groups having identical travel times."

This section opens with a Summary (p. 45) that states in the first sentence: "The 2009 out-migrant survival, timing, and travel time from the Snake River basin reflected the court ordered spill operations that took effect in what was an average flow year in the Columbia River and an above average flow year in the Snake River." The following observations (from section "Results for Multi-year Reach Fish Travel Time and Survival Estimates, p. 67-76) indicate that this is a premature conclusion and not appropriate for "headlining" in the report.

Increased court-mandated spill levels in 2006 and subsequent years coincided with increased flow levels in those years: flows during the critical period for smolt migration through the lower Snake River dam complex (April 14 to May 21) were higher for all years from 2006 through 2009 than for the years 2001 through 2005. The two highest-flow years from 2001 through 2009 were 2006 and 2009. Therefore, increased flow and increased spill are confounded for the period of interest.

We changed the opening paragraph to read as follows :

"In 2009 court ordered spill operations were in effect in what was an average flow year in the Columbia River and an above average year in the Snake River. The start of transportation was

delayed at Snake River dams which resulted in a significant reduction in the proportion of fish transported. Survival estimates of spring migrants, particularly Snake River steelhead, were relatively high in 2009, compared to other past years."

Your statement that spill and flow are confounded is not true. Migration year 2007 was actually a very low flow year. Spill in such a low flow year was not provided prior to the court order. Therefore, the inclusion of spill in 2007 likely had a profound effect on survival of spring migrants that year. See the CSS 2008 report Chapter 2 for a thorough analysis of the impacts of spring spill in 2007 in particular on juvenile survival in such a low flow year. We had two other recent years (2001 and 2005) with similar low flows in the Snake River, when spring spill either did not occur, or was very limited. Reach survival in those years was much lower than 2007. So the confounding statement is simply not true and shows a lack of understanding of historic conditions in the river system.

Figures 26, 27, 28 and 30 (p. 72 to 74) summarize annual mean Lower Granite-to-McNary Dam survival estimates for steelhead, hatchery Chinook, wild Chinook, and sockeye in the years 1998 through 2009. Excluding 1998 and 1999 (because flows were relatively high and some spill occurred) and 2001 (an extremely low-flow year), visual comparisons of survival rates for the 2000, 2002-2005 period (prior to court-mandated spring spill) and the 2006-2009 period (after initiation of mandated spring spill) do not suggest improved survival rates in 2006-2009 for hatchery or wild yearling Chinook, but do suggest somewhat higher survival rates for steelhead. Mean survival rates are also higher in 2006-2009 for sockeye, but confidence limits are very wide. The improved survival rates for steelhead (and possibly sockeye) in the 2006–2009 period are associated with both increased spill levels and higher flows in those years.

We agree that hatchery yearling Chinook survival appears relatively similar over the past several years. We have removed the phrase that suggests improved survival for hatchery yearling Chinook.

Figures 31 and 32 (p. 76) summarize annual mean McNary-to Bonneville Dam survival estimates for steelhead and yearling Chinook in the years 1999 through 2009. No temporal-trends are apparent, although the single estimate for steelhead in 2009 is relatively high (similar to high estimates in 2002 and 2006). We realize that analyses in other reports have shown correlations between spill and travel time, but they are not reported or cited here.

We agree that no temporal trend is apparent. There is no reference in the section to temporal trends. Again, temporal trends are of interest but not a primary concern in analyzing these data. We added plots of fish travel time and will provide more detailed analyses in future reports that will provide a better understanding of the role of spill in fish passage including survival and travel time in attempt to show the relationships between travel time and flow. More thorough analysis is needed to show the influence of spill on fish travel time. We will provide more detailed travel time analysis in the 2010 report. We refer the ISAB to the CSS 2008 Annual Report Chapter 2 for detailed analyses of spill travel time relationships.

Lower Granite Dam to McNary Dam (Tables on p. 68 to 71) and from McNary to Bonneville Dams (Tables on p. 72-75) are reported for various release groups (2-4 groups each year) from

2002 to 2009. Perhaps analyses should be performed to test for trends in travel times, and/or the data plotted so that they can be visually evaluated for trends or discontinuities.

In the section "Multiyear Analysis of Subyearling Chinook Rock Island to McNary Dam Survival" (p. 80) an attempt is made to model the effects of environmental variables (flow, spill, water temperature, fish release date) on survival of subyearling Chinook. Results of the analyses, which used information theoretic methods, suggested that water travel time (flow) was the most important variable influencing survival. Estimated survival rates were not, however, a good fit to observed survival rates after 2002. The report suggests that the poor fit may have been due to the effect of increased spill on detection probability at McNary Dam, resulting in increased variance in survival estimates. Complex changes in the operation of the mid-Columbia dams in the 2005-2009 period (increased spill at McNary dam, decreased spill at Priest Rapids and Wanapum dams, along with installation of surface bypass structures) clearly presented a challenge to this modeling attempt; future attempts with additional years of data may be more successful. Unevaluated interactions between variables, particularly between flow and spill, may also have contributed to a poor fit of predicted to observed survival values.

Much of what you have stated here appears to reiterate the discussion section of this analysis and so we would tend to agree with it. We will consider additional years of data for future analysis. Interaction terms add both model complexity and decreased degrees of freedom. In addition, in the presence of interactions, coefficients can become relatively meaningless and model fitting is not our only objective. We also seek to understand the implications of the fitted model. With interactions, added coefficients can become meaningless and while interaction effects may improve fit the change in coefficients renders the fitted model less useful for understanding the result in terms of management implications.

Editorial Notes
In several places in the report it appears that that a new paragraph was started without an indent, e.g. p. 23 (the last two paragraphs in the Executive Summary), p. 67, and p. 74.

Corrected.

On page 63, Tables 23 and 24 are referenced as Tables "12" and "13", and on page 65 Tables 25 and 26 are referenced as Tables "13" and "14".

We corrected the reference.

In Table 32 (p. 75), average spill levels are given as percentages, but in Table 33, on the same page, average spill levels are given as proportions.

Corrected.

The first three of the four subheadings (p. 80, 81, 83) under "Multiyear Analysis of Subyearling Chinook Rock Island to McNary Dam Survival" are preceded by a number; the fourth ("Conclusions for the Subyearling Chinook Analysis"", p. 89) is not preceded by a number. Only the third subheading ("3. Results") appears in the Table of Contents (p. ii).

Corrected.

In sections where observations are reported for different species-rearing groups in sequence (e.g., the "Results for Multi-reach Fish Travel Time and Survival Estimates" section starting on p. 67), it would help readers if a new paragraph were started for each group. The text is difficult to follow when descriptions of different species-rearing groups, sites, and time periods follow without breaks.

We have incorporated paragraphs to break up the text.

The sockeye travel times reported in the last sentence on page 67 are not consistent with the data presented in Table 31.

This was a typo in the report. The sentence has been fixed to match the data that are presented in the table.

The captions for Figures 31 and 32 (p. 76) read "Reach survival estimates...from 1999 to 2007", but should read "Reach survival estimates...from 1999 to 2009".

The captions read: "Reach survival estimates of PIT-tagged yearling Chinook from McNary Dam to Bonneville Dam in the years 2002 to 2009. Dashed line represents average survival from 1999 to 2007." The 1999 to 2007 reference is to indicate that the average was over years prior to 2009 and did not include 2008 when survivals were not estimated.

On page 74 some mention (reminder) of why 2008 is not included in Table 33 and Figure 32 would be useful.

We added the following sentences…
Survival estimates were not included for 2008 due to problems associated with the estimation of survival in that year in the reach. See the FPC 2008 Annual Report for a detailed discussion of the estimation problems.

It is not clear why only years 1999 to 2000 are used for survival comparisons. Further explanation would be useful.

We are not clear what this statement is refers to. We typically compare all past years to the current year and look for patterns in survival that help to explain the survival observed in the current year. If the ISAB means beginning in 1999 through 2008, then the explanation would be that for McNary to Bonneville Dam reach estimates there were insufficient tags in 1998 and prior years to estimate survival in that reach.

Adult Fish Passage

Table 41: The 2009 projections are matched by 2009 observations, and then (along with other information) converted to projections for 2010. In some cases, 2009 observations were substantially less than 2009 predictions, presumably based on earlier returns, which are then followed by very large increases in the corresponding 2010 predictions. In other cases, the 2009 observations exceeded the predictions by a comfortable margin and were then converted into smaller predictions for 2010. When the 2009 match was close, the 2010 predictions were changed very little from those for 2009. The text states that the predictions employ a lot of information, without being very explicit about the translation of "information" into "prediction." That would be OK, but the predictions for 2010 seem odd; they go up when performance in 2009 is below expectation and seem to go down when the 2009 performance exceeds expectations. One realizes how inexact these predictions can be, of course, but these values seem peculiar. Perhaps the FPC Annual Report could direct readers to the U.S. v. OR Technical Advisory Committee (TAC) web site for more information.

In response to your request two sentences were added referring the reader to the WDFW website containing TAC memorandums about 2010 salmon forecasts, one as a footnote to Table 41 and the other sentence in the paragraph with the title, "Predicted run sizes".

In the draft annual report, there is a consistent pattern of describing shortfalls or decreases over time as percentages of the higher number (e.g., 83.2%), but when there is an excess or increase over time, it is reported as multiples (e.g., 5.7). We understand what the authors are doing, but consistency would be better. One could use 83.2% and 570%, or 0.83 and 5.70; either would be consistent and fine.

We realize that the use of percentages and multiples appears inconsistent. However, this is the historical convention that has been used regionally and over all years in the adult section of the annual report and the adult section of the weekly report. We prefer to remain with this convention to ease comparison among historic years. .

Differences in counts among dams (tabulated in Table 44, which lacks a label and caption) are discussed in the text because these differences provide information about the distribution of adult returns within the basin. To facilitate this useful discussion, it might be worthwhile to graph the distribution of each species or size grouping (i.e., each column in Table 44) by river segment demarcated by successive dams; this could be done with a bar graph in which the height of a bar for each river segment is simply the count at the dam forming the downstream boundary minus the corresponding count at the dam forming the upstream boundary.

Table 44 will be changed to include a label and caption. Appendix J contained maps with bar graphs representing the count of fish at each project. These maps will be moved to the body of the report for the final version. We believe these are sufficient to give the reader the relative change in magnitude in populations between projects. However, as we advised you when this comment was made regarding last year's report we believe that subtracting the upstream passage from the downstream passage to represent the distribution of fish by river segments can be misleading. In order to accurately portray the adult salmonid migration a great deal of data would be required including harvest data by area, straying data, tributary turn off counts, estimates of between dam mortality, fall back rates, between dam mainstem spawning, count differentials between dams and the fact that the steelhead return straddles a calendar year.

The table on pages 102 and 103 needs a number (presumably it is Table #44) and a caption. We note that the two tables on page 104, also need captions, and they are different from each other and those on pages 102 and 103. They probably need separate numbers. For the tables on 102 and 103, it would be useful to have percentage figures for the jacks. Because jacks are a different age than adults, the question arises whether we also should be tallying them against their own birth cohort, rather than only the run they come back with. That would be tricky reporting, but there is growing suspicion that the "jacking rate" may be changing, perhaps in response to hydrosystem reality and/or to changing climate. The matter is dealt with at some length in the Memoranda section, and a flag to that material would be good. At the moment, one could presumably dig that information out of these tables, but perhaps even a graphic in that form would be useful. The matter is going to become important in the near future.

Table 44 spans multiple pages and we will try to label it more appropriately. We do not agree with the ISAB regarding adding the percentage jacks to the tables. Table 44 simply reflects the cumulative dam counts at each project by river zone. Jacks are determined based on size criteria when counted at dams. They are an indicator of the return of immature fish, but because the determination is based on size they are not an accurate count of jacks. Small 2-year old fish could be counted as jacks and large jacks could be counted as two year old fish. Therefore, jack counts would not be used as the basis for the types of analyses you describe. We prefer to use the dam count of jacks as an indication of the percentage of jacks returning, but go no further since it could be misleading. The only accurate way to assign jacks to a specific cohort would be to use PIT tagged fish, where the year of tag application is known. This is discussed more fully in our memos and since we do not address jacking rate in the text, we have not referenced this material.

For the steelhead table on page 104, it might also be of interest to present the estimated kelt numbers and percentages, either referenced to their birth cohort, to their run group, or both. There is growing interest in life-history evolution in all of these species, but particularly in steelhead, as the "situation" changes requiring that this presentation be disentangled in the near future.

There are routine counts of steelhead kelts made at the dams by the COE, but it is limited to the kelts that are observed on the separator bars of the juvenile bypass systems. In addition, the FPC keeps track of the incidental catch of steelhead kelts in the juvenile collection tanks, and there have been specific research studies that look at kelt passage via specific routes at some of the projects. However, since not all routes of passage are monitored and a large portion of kelt passage occurs outside of the operation of the juvenile and adult facilities these data are not complete estimates of passage at a project, and would only be misleading to the reader. Therefore, the data would not be useful in a way that the ISAB would like it to be used.

Table 45 seems to show a trend in the temporal length of the spawning run, and that is of interest (if it is happening), relative to changing climate and (possibly) hydrosystem and hatchery management. A full-blown statistical test is out of place in this report, but perhaps a few passing comments would be in order. In that vein, although the [1%, 90%] interval has appeared in previous FPC reports, in looking at the subsequent plots, the [1%, 90%] interval does not seem

an obvious choice in preference to [10%, 90%] or [5%, 95%]. Even in view of the asymmetry of most return time distributions, the cumulative plots suggest that bracketing the median with a symmetric interval would reduce the temporal noise from the unpredictable lengths of the tails.

The FPC report does not speculate on the temporal length of the run, but merely presents the data. However, there is a memo dated April 8, 2009 in Appendix A that addresses the question of the timing of the 2009 spring Chinook migration in the context of historic data. Based on the long time series of available data, the FPC is not convinced that there is a trend in the temporal length of the spawning run, independent of the physical factors of flow and temperature. (In fact the 2010 run started much earlier than the past few years and will have a longer temporal run reported)

We recognize that there are numerous ways to present the data to the public, and the desire for a specific presentation is dependent on the user group. The FPC has a wide variety of user groups, including the sport fishers on the Columbia, who make use of the 1% statistic in planning their activities. The daily passage data are available through several links (which we will include in the text) and the interested reader can compile the data for their own specific use, or the FPC can provide the tables with any combinations of percentages in response to specific data requests.

The following statements (p. 110) appear inconsistent, "The 2009 adult and jack summer Chinook counts at the four Snake River projects increased when compared to both the 2008 counts and the 10 year averages. The 2009 LGR adult summer Chinook count of 14,482 was only about 64% of the 2008 count and was 1.3 times greater than the 10 year average."

These statements will be fixed as follows:

The 2009 summer Chinook jack counts at the four Snake River projects increased when compared to both the 2008 counts and the 10 year averages. The 2009 adult summer Chinook counts decreased at 3 of the 4 projects between 2008 and 2009 and increased at all four projects when comparing 2009 and the 10 year average count. The 2009 LGR adult summer Chinook count of 14,482 was only about 64% of the 2008 count and was 1.3 times greater than the 10 year average. The 2009 jack summer Chinook count of 16,367 was 3.2 and 5.9 times greater than the 2008 counts and the 10 year average.

The bimodal run time distribution for Coho argues for at least the possibility of a mixture of separate population distributions. All of the curves go up and down to some extent, but there is a fairly large temporal offset between the two peaks. Are the fish in those two run periods from the same place, or is there geographic variation in run timing that we have not codified previously?

The ISAB poses questions that cannot be answered on the basis of the dam count information. All dam passage distributions represent the conglomerate passage of separate population distributions from different geographic area. Bimodal distributions are related to population distributions as well as both physical and biological factors. However, individual tag groups (if available) would have to be researched to say anything further on this subject. As such, this question was outside the scope of the FPC Annual Report.

The following first sentence seems inconsistent with the remaining sentences (p. 134), "The removal of the 25 sea lions between 2008 and 2009 did not reduce the overall salmonid consumption estimate in 2009. The 25 sea lions that were removed accounted for 22% of all of the individual salmonids catch events. These same sea lions were present more days and consumed more salmonids per capita each year compared to the other pinnipeds at Bonneville Dam, indicating that the removal program successfully targets individuals that are most likely to stay longer and consume more salmonids (Stansell, et al. 2009)." Did new recruits replace the removed animals? If so, this should be mentioned.

The list of sea lions to be removed does not include all of the sea lions present at the dam. The removal list targets individuals that are most likely to stay longer and consume more salmon. Each year previously unidentified sea lions migrate to the dam. In 2009, the number of new individuals replacing animals removed was 16, the lowest since 2005.

The following is from the Stansell report "California sea lions not previously identified continue to show up each year. Of the 53 highly identifiable animals observed in 2009, 16 (30.2%) were "new" additions to that category (5 branded and 2 more given brands while at Bonneville). The percentage of "new" California sea lions each year was 70.7%, 48.8%, 22.9%, 37.7%, 34.4%, and 33.8% for 2003 through 2008, respectively, so we did not see a great increase in new individuals in 2009 replacing the animals removed. In fact, 16 newly identified California sea lions was the fewest, matching 2005. Three sea lions have been observed all eight observation years." pg 17.

Figures 52 and 53, along with Table 50, argue that something dramatic changed for Steelhead in 2009. The report documents it nicely, but a comment is in order. What are some possible causative factors? A benign ocean? A benign river? Spill? A short permissible spawning period for that year? Are there additional possibilities?

The steelhead returns for 2009 are discussed in detail in the August 27 and September 29 memos in Appendix A. These memos will be referenced in the text.

<u>Run timing</u> – Spring Chinook adults are arriving quite a bit later than decadal average for 2008 and 2009, but the jacks are not. They are coming with the later running adults. Meanwhile, Summer Chinook adults are arriving earlier and the jacks much earlier than decadal average. What does all of that mean? These data need further discussion. Is it possible that climate change is involved? We see on page 157 that Fall Chinook are released into the Snake earlier than had been the case in earlier years. Again, the presentation is showing the patterns, but one needs to be able to connect the dots.

The FPC cannot speculate based on dam counts regarding a change in migration timing. As we pointed out earlier in our comments there are several variables that must be taken into consideration, including how dam counts are tallied. Runs of fish in dam counts are determined based on a calendar basis. For instance, all Chinook counted at Bonneville Dam until June 1 are considered spring Chinook, while all Chinook passing after June 1 are considered to be summer Chinook. Consequently, if the spring Chinook run is late it could

overlap into the time period designated for summer Chinook, and skew the data such that summer Chinook can be mistaken as "arriving earlier than the decadal average".

Editorial Notes
In the second sentence in the first paragraph on page 120 the word "then" should be "than."

Corrected.

On page 122 it is not clear why Chinook are mentioned in the Pink and Chum Salmon section.

Both Chinook and Chum spawn at Ives Island. The study evaluated the spawning habitat relative to flow below Bonneville dam. The paragraph was changed to delete Chinook and replace with the effects of flow on spawning habitat below Bonneville Dam.

Specifically it reads:

The Ives Island complex is one of the few remaining mainstem spawning areas for chum. In March 2000, a joint study by U.S. Fish and Wildlife, Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife looked at the effects of flow on spawning habitat below Bonneville Dam. It was found that Bonneville Dam flow level determines the amount of spawning habitat available to these fish at the Ives Island site and that flow level and fluctuating flow can eliminate spawning habitat, dewater redds and strand emerging juvenile salmon (USFWS, ODGW, WDFW, 2000).

Figure xx on page 123 should be Figure 54. Also on page 123 the reference to Brostron et al. contains a typographic error.

Corrected.

On page 143, Tables XX and Figures YY need numerical inserts.

Corrected.

Table 52 contains years 1987-2009 rather than 1979-2009. Figure 62 contains a portion of the data in Table 52 rather than the same data as claimed in the text. Similarly the text claims that Figures 63, 64 and 65 contain the same data as Tables 53, 54 and 56.

The table heading for the BBON release data has been corrected. Also, Figures 62 through 65 have been changed to display all available years of data for each of the river zones. Note: due to the addition of new tables and figures, these figures and tables may have different numbers in the final draft.

Columbia River Basin Hatchery Releases

Non-anadromous releases are not presented in the report. Non-anadromous fish are not within the mandate of the Fish Passage Center, but the information is important and becoming increasingly useful. There were various places in the report where attention was directed to web-site sources for additional material not presented here. That link to other material was helpful. In that same vein, a redirection of the users interested in non-anadromous releases to an appropriate source of such information would be an appropriate way to bridge this gap.

We agree with the ISAB that non-anadromous fish are not within the mandate of the Fish Passage Center. However, we are willing to query the fishery agencies as to whether such a link exists, and if they agree to provide us the links we can reference them in next year's report.

The section on below-Bonneville releases is a very much appreciated and valuable addition.

Thank you.

We note that there is no marking of the resulting progeny for (typically marked) hatchery-reared adults, which were released into spawning areas for "natural" production. For egg and fry releases in general, there is no marking. It would be good to be able to gain some sense of the number of PIT-tagged fish released from the hatcheries, but completely unmarked releases make any subsequent performance tracking an estimation exercise fraught with difficulties. Again, while marking is not the responsibility of FPC, subsequent evaluation is, and the annual report might include a comment to the effect that marking of important (particularly experimental) releases would be advanced by some form of marking technique that does not require "handling." Otolith marking is mentioned in one case; stable isotope analysis has some attractions, given a hatchery diet; non-destructive parental genotyping in the hatchery might serve admirably for such releases (see references in ISRP/ISAB 2009-1).

The FPC is confused by what the ISAB is requesting with this comment. While this section of the Annual Report does not discuss marking information in great detail, Appendix F provides detailed marking information for each of the hatchery release groups in 2009. Marks other than adipose clips and coded-wire-tags are included in this appendix.

We are sure the ISAB are aware that from a fisheries management perspective, there are severe limitations to otolith and stable isotope marking. First, these marks do not allow for real-time analyses, as they require recapture of the tags, extraction of the tags and reading by qualified personnel. They could not be used to make conduct in-season and post-season analyses of the type conducted by the FPC. Second, otolith and stable isotope marking techniques do not allow for individual marking and, to some extent, do not allow fisheries managers to distinguish between different release groups.

Major hatchery production and release changes and trends are nicely reported but not interpreted. Regional strategic planning would be advanced if the readers had an understanding of whether the strategic hatchery management decisions that underpin cumulative release changes of this magnitude are the net consequence of myriad local decisions, based on strictly local criteria, or

whether there is some coordinated strategy. A few general comments on the overall reason(s) for "why" such large changes are occurring might be helpful, if feasible.

This is clearly outside of the scope and expertise of the Fish Passage Center staff. Changes in production goals and practices are a function of the US v Oregon Production Committee and the Hatchery Oversight Team. When applicable, the FPC staff attempt to explain why some changes in production occur, but this is typically when there has been a mass mortality event or a change due to limitations in adult egg take (as in 2007).

Appendix A – Memoranda

The memoranda in this appendix and the information and analyses contained therein form the portion of the FPC annual report that is most amenable to, and would potentially benefit the most from, selected ISAB review. A review of the FPC responses indicates that they are carefully prepared. The quarterly report dated April 14, 2009 provided a useful overview of activities.

The memoranda provide an edifying glimpse of the range of FPC activities and are full of valuable information. Some of them address fairly controversial matters such as recent NOAA concerns over BiOp-mandated early spill for 2010. That matter came before the ISAB (independently) in 2010, and is an example of an FPC report on a "controversial topic" that would have warranted ISAB examination, jointly with its consideration of the original report. Though an independent assessment was certainly in order, it would have been good to have both reports to examine simultaneously. It will be important in the future to flag such reports for coordinated and timely ISAB attention, rather than in retrospect.

The process for determining review of FPC products has been established by the FPC Oversight Board. All FPC memorandums and work products are posted on the FPC web site and available for review by the ISAB or anyone on the same date that they are provided to the requesting entity. It is important to note that other regional entities are not subject to the same requirements of providing work products to the region for review. In response to a request by the fishery managers the FPC reviewed the subject NOAA report and provided comments to the agencies. These were available on the web site at the same moment that they were provided to the requesting entity.

Appendix I – Technical Letters

The technical letters also contain valuable information, but they are voluminous enough that they preclude useful review in the short "comment period." ISAB review of technical letters would be beneficial in only those few instances where significant scientific analyses conducted in the letter are called into question. A review of the 2009 letters shows that most of them are joint, interagency technical-team letters, implying that at least some level of consensus has been reached; their analyses are mostly summarized and not typically suited to ISAB Review.

ISAB review of technical letters developed by the joint staffs of the fishery management agencies is probably beyond the scope of the assignment to the ISAB to review FPC work products. The Joint Staffs Technical Letters and Memorandum are not the product of the

FPC. The are the product of the technical and policy staffs of the fishery agencies and tribes. They are included in the Appendix because the are an important part of the fish passage story for that year.

Appendix J – Maps.
Most were very good for project reporting, but some (J-5 and particularly J-7) showed many smaller tributaries, for which no information was presented. The visual aids should contain only necessary information.

The maps show the 2009, 2008, and 10-year average dam counts and the geographic distribution of the streams where each species are known to occur. The major tributaries where each species spawn are labeled and mentioned in the text. In addition, the watersheds where each of the species occur are labeled and mentioned in the text. Although the smaller tributaries are not labeled and mentioned by name in the text, displaying them on the map allows the reader to see the spatial distribution throughout each of the watersheds where each of the species occurs. Each species sections states that the maps shows the species spatial distribution throughout the CRB.
In the Adult Fish Passage section, references to maps in Appendix K should refer to Appendix J.

The maps are now included in the adult section of the annual report.

It appears that maps 6 and 8 in Appendix J are identical.

The two maps are identical in that they refer to sockeye. However, one map displays the information for the entire basin, while the other shows the information for the Snake River. The counts at the Snake River dams are much lower then the Columbia River dams. The bar graphs in the Snake River map are proportional to only those dams shown on the map. We have changed the caption for the Snake River map (now Map 7) to avoid confusion.

Additional comments:
The transportation conversions in Appendix G served as a reminder that it would be useful to have the transported fish sorted in a way that would give us T_1, T_2, T_3 when TIRs are computed, instead of the current practice of lumping them into a single back-calculated T cohort, for comparison with the IR cohort. That would require more work, but it would be good to know whether it would be better to transport from all three projects or just from one of them.

The ISAB comment regarding the computation of TIRs does not relate to this appendix. The purpose of this section is to show the methodology used in calculating the percent of the run transported in any given year. Its intention is for the use of the Fishery Managers in comparing that year's operation to the "spread-the-risk" management strategy. These data would not be used in calculating the TIR ratio. TIR ratios are presented elsewhere, such as in the CSS Report.

On page 1 and A-88 the word “repot” was used rather than “report.”

Corrected.

The font size used in Appendix F creates a challenge to the reader. If possible a larger font size would be appreciated.

The font size for this appendix has been increased.