

Review Comments: Effects of the Columbia River Hydropower System on Salmon Populations

A. General:

1. Suggestions for minor editorial changes were not made. We expect that they will be corrected during redrafting.
2. We are aware and generally support comments already provided by the other Action Agencies. Our specific comments are not intended to duplicate those other efforts.
3. The paper would benefit from a conclusions/recommendations section that would provide a sense of where programs (e.g., transportation) should be directed in the long-term to provide the greatest benefit to salmon populations.

B. Specific:

Page	Para	Line	Comment
2	1	7	Delete "hundreds of", replace with "about 200".
2	1	19 - 23	We suggest there is a dearth of information on pre-dam conditions in the basin with which to compare effects between the river with dams in place versus the river without the dams.
3	2	9	Should human population increases followed by urbanization be included in this list of environmental stressors?
3-4			The 'Impacts from Dams' section, although technically correct, fails to indicate that there have been many improvements to the system (facilities and operations) since the days when survival was dismal. This leads the reader to assume that there have not been any improvements since that time. This is especially apparent on page 4 paragraph 1.
5	1		section a. How would removing 4 of the 8 mainstem dams "eliminate" delayed mortality? Would it not merely shift the mortality to the lower dams? This appears to be a leftover statement from the LSR Feasibility Study.
5	1	b	Is this 30 years of favorable and 30 years of unfavorable?
5	2	7-9	This sentence is confusing. Please reword to clarify.
10	4	8-10	This line is difficult to understand, can it be written more clearly?
12	4	3	It is not clear how groups that were "most representative of a hatchery's production release" were selected. What are the criteria used for this selection?
13	2		Has survival past the dams ever been analyzed for day/night especially with respect to fish entering the tailrace of McNary Dam through the bypass system. Would there be a benefit to operating the facility to bypass fish at night when predation might be lower and transport fish collected during the day?
14	2	5	This statement is misleading in that Crescent and Badger islands are downstream of the mouth of the Snake River and many piscivorous birds nest on them.
14	2	7	Need a reference for the "Tech Memo"
14	2	12-15	Please elaborate on this by indicating PIT detection capability at key sites upstream such as Ice Harbor.
16	1		No discussion of travel time to the estuary?
19	2		Is "D" the same for all collection sites or is it merely assumed to be?
21	2	3	It isn't clear how release date is a "trait" when, in the following paragraph, traits are referenced based on the time of tagging.
22	3		This paragraph has so many different ranges of years that between year comparisons are difficult. What was the reason for selecting the ranges? Can this be clarified please?
22	3	5-8	Suggest identifying the proportion of these fish that were transported.
22	3	10-17	It is not clear what range of years are being analyzed in all of these statements. This data would be better presented in a table format.
23	1		The statement about 40-50% increased travel times makes no mention of the increase in travel times caused by completion of the Canadian storage projects that drastically reduced the peak in the hydrograph and thereby decreased travel velocities in the lower river.

23	2	2	...a low of 0.494 in 1997 to <i>a high of</i> 0.697 in 2000...
25-27			Why aren't survival estimates reported for the free flowing section to use for comparison to the mainstem hydropower system? This is often overlooked. Survival estimates from point of release to the Snake River trap, from release to Lower Granite, and Snake River trap to Granite could help with these calculations.
27	YSS	3	The value of .267 does not match the table.
28	Table 6		Suggest adding LGR to MCN and MCN to BON as columns.
29	1		Suggest adding information on growth rates of fish because of the relationship between size and migration from the lower Snake River.
31-34	Tables 8-10		The presentation of SAR data for recent years that still have incomplete adult returns, particularly 2003 should be qualified in a manner that the data are not used for comparisons for years with complete returns.
36	2 & 4		Inconsistent statements for steelhead? How does potential for steelhead residualization affect the conclusions?
37	2		Please indicate that transport of yearling salmon from McNary was stopped in 1995.
37	3	1	...PIT-tagged <i>spring migrating</i> Chinook salmon...
37	3	2 & 3	"hatchery" and "wild" are reversed from what is shown in Table 13.
39	Table 13 & 15		We question the real statistical significance between the first time detected vs non-detected, especially where many of the values for adults from first detections are in single digits..
41	Table 15		In the caption for the table, this does not indicate what run of Chinook are being considered. Spring or summer migrating juveniles?
45	1		Because hatchery fish tend to come through in groups, is it possible to determine (with larger recent adult returns) a "D" for hatchery or stock specific returns? E.g., are there enough Rapid River fish returning to determine D for that hatchery? If so, would it be possible to develop a seasonal D component for hatchery fish as a whole across when they came through the facility?
Overall			Why do we not have weighted T/Is for transported fish? If the peak of the run coincides with the highest transport values, and the lowest transport values occur early in the season during the smallest portion of the run, the T/I really needs to be weighted for how many fish are being hurt/helped by the transport process.
Overall			With respect to "D", "Natural" culling of fish above Lower Granite may actually be nullified by the spill program. There may be equal or greater effects of multiple spill passages as compared to multiple bypasses. As a result, those fish that are spilled would be transported at each dam, with a delayed effect of spill showing up in the downstream transport process. Therefore, we do not see an increasing D value as we transport from further downstream.
51	3	6	The lowering of T/I ratios for McNary should not be surprising in that lower river conditions for fish have improved since the 1980's. This should not be construed as a lessening of the benefits of transport but more so an improvement of lower river migration conditions.
51	4		To say that mid-Columbia subyearlings do not experience delayed mortality, merely because we have a hard time measuring it seems to be a big stretch. It would be safer to indicate that we do not know if they have extra mortality particularly in light of the fact that it was indicated on page 29 that it is very difficult to even measure survival or travel times for subyearlings.
52	2		What are the length frequencies across the season as compared to fish that are multiple-bypassed? This information could be gathered through the smolt monitoring program and/or Doug Marsh's length frequency data. This may apply to the differential survival of earlier transported fish.
52			The modifications of Lower Granite and Little Goose juvenile fish facility may also have contributed to improved bypass success, however, this is not even mentioned in the analysis.
53	2	12	It is possible that hatchery practices have improved at some locations to help account for the improved SARs. For example, Rapid River Hatchery personnel have stated that their hatchery fish appear to be of much higher quality than even 5 years ago.
53	2	15	Chris Peery indicated that fish tagged and transported out of LGR had as much as a 15% higher stray or non-success rate as those fish that were tagged at a hatchery and transported. Could this be why the two numbers differ?

53	2	17	should this sentence end with “..larger <i>hatchery</i> fish” rather than wild?
56	3	13	If this is the case, then we should discontinue the spill as late as we currently do, and should start full transport earlier than we do.
56	4		This might be true if we are not concerned about the apparent lower than expected survival through the McNary Bypass. The question may not be a comparison of T/I but more so transport to bypass.
57	3		No discussion of water temperature - is there a relationship between temperature and migration rates?
62	1	10-12	Delay of transport, if done so in moderation, may not have an impact. We suggest evaluating a weighted T/I for wild steelhead and all other stocks to determine the impact that it might have on the population if we delay transport.
62	3	3-5.	It is likely not an either/or relation but could also be a combination of the two.
64	1	3	Earlier discussion suggested that the smaller fish may not survive as well. What was the size difference among the early/late-migrating fish and can this difference account for the difference in SARs?
Figure 1			This map is inaccurate in that Rocky Reach no longer has juvenile PIT detection. In addition, the figure caption should indicate juvenile fish PIT detection, as opposed to juvenile or adult detectors.
Figure 6			The paragraph citing this data does not specify these years, why were these years chosen and why isn't 2000 in the mix?
Figure 7			If this relationship is true, then would you not expect a high D value for fish released from Sawtooth if they have been culled prior to reaching the hydrosystem?
Figure 9			Data exists past 2001, please include it.
Figure 13			Turbidity is measured in NTUs, not feet. This reference is to transparency?