

# State, Federal and Tribal Fishery Agencies Joint Technical Staff

*Columbia River Inter-tribal Fish Commission  
Idaho Department of Fish and Game  
Nez Perce Tribe  
Oregon Department of Fish and Wildlife  
Shoshone-Bannock Tribes  
US Fish and Wildlife Service  
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October 18, 2004

Scott Dunmire  
US Army Corps of Engineers  
Walla Walla District  
Environmental Analysis Section  
CENWW-PM-PD-EA  
201 North Third Avenue  
Walla Walla, WA 99362-9265

Dear Mr. Dunmire:

This correspondence is in response to comments received from reviewers of the Agencies and Tribes Snake River Fall Chinook Transportation Proposal entitled “Estimating migration and survival rates among transported and in-river migrating Snake River fall chinook”. The state, tribal and federal fishery managers have been participating in the process established by the Corps of Engineers to reach an agreement on the required evaluation of the present transportation of fall chinook. The process began with a Corps of Engineers sub-committee meeting in June 2004 to develop and agree on a one-page description of the project describing the purpose and objectives of the transportation evaluation. The agencies and tribes developed a proposed transportation evaluation on the basis of those discussions and the one page description. Subsequently, on September 15 you provided Corps of Engineers comments on the proposal, and on September 22, you forwarded comments on the joint agencies and tribes proposal.. The author of the comments in both cases was not identified in your transmittal. Following is our formal response to the two sets of anonymous comments that were provided on the joint agencies and tribes proposal. We appreciate the time that reviewers have spent preparing comments. We have addressed all of the comments that were provided. The joint agencies and tribes support this proposal for fall chinook transportation evaluation and are submitting the revised proposal for funding in 2005.

## First Anonymous Reviewer

1. Whether or not it is appropriate to fund a member of SCT or SRWG to perform research is not a scientific technical question and needs to be addressed at a policy level. However, it is interesting that NOAA Fisheries CZES is a member of the above-mentioned groups and there doesn't appear to be a conflict there. So if this poses a problem, we suggest that the Corp specifically clarify their criteria for membership on the SRWG and procedures for funding projects. This would eliminate the perception of dual standards for different agencies.
2. The PIT tagging will be split between NOAA Fisheries CZES, Nez Perce tribe, and USFWS as the large numbers of subyearling fall chinook to be PIT tagged will require multiple organizations to complete. We envision a funding approach similar to what the COE used in the Mid-Columbia River basin where multiple organizations performed the PIT tagging of hatchery chinook and steelhead (a process where our office assisted with the PIT tagging).
3. Numbers of wild fall chinook PIT tagged will always be too low to directly compare SARs between collected smolts that are transported (study category  $T_0$ ) versus those that are bypassed (study category  $C_1$ ) with adequate levels of precision to show statistical differences (though trends over time and point estimates will provide useful information). That is why we must use hatchery fall chinook. However, it is still important to verify that the patterns in the SARs and inriver survival between these two study categories are similar for both wild and hatchery stocks over the years of study in order to assess whether the hatchery stocks are functioning as good surrogates for the wild stocks with regard to SARs. The second issue of how to handle fish that are never detected at any dam is not addressed by PIT tagging at Lower Granite Dam. In our proposal, fall chinook that pass through the four collector dams undetected to the tailrace of McNary Dam are in study category  $C_0$ . Some of these fish may be subsequently detected at John Day and Bonneville dams and at the NOAA trawl operated approximately halfway between Bonneville Dam and the mouth of the Columbia River. Given that fall chinook may out-migrate as subyearlings or hold up somewhere in-river and continue to out-migrate as yearlings, this makes handling this study category ( $C_0$ ) more difficult. But collecting and PIT tagging fall chinook at Lower Granite Dam is not the answer to that group of fish, because by being collected at Lower Granite Dam, the fall chinook effectively become members of study categories  $T_0$  or  $C_1$  depending on whether they are transported or bypassed, respectively. In the first few (non-spill) years, very few subyearlings will migrate through the Snake River projects undetected because they would be comprised of fish which migrate through the turbines at all four projects.
4. The primary PIT tag detection sites for returning adults will be in the ladders at Bonneville, McNary, Ice Harbor, and Lower Granite Dam, where PIT tag detections are present to interrogate tagged adults. The adult returns from smolts released at Big Canyon, Captain Johns, and Pittsburg Landing acclimation ponds are only collected at Lower Granite Dam for broodstock at rates of between 11 to 15%, and the remainder are allowed to pass upstream to spawn naturally (or be harvested). The adult returns from smolts released on-site at Nez Perce Tribal Hatchery that return to the hatchery ladder or are taken from the sample at Lower Granite Dam are also used for broodstock. But for purposes of this study, we consider the final recovery site to be Lower Granite Dam.

5. The fact that fall chinook may either out-migrate as subyearling or yearlings in unknown proportions adds difficulty to handling PIT tagged smolts that are never detected at any site. However, during the first years of this study prior to the provisions of spill for testing more enhanced riverine conditions, the “never-detected” PIT tagged fish are not the main group of interest. As shown in the proposal, the PIT tagged fall chinook in study categories  $T_0$  and  $C_1$  are all detected at a collector dam with a known date of detections. For those fall chinook that are detected at one or more collector dams during the year of migration as a subyearling, regardless of whether or not those same fish complete their out-migration in the same year, a valid estimation of population size in Lower Granite Dam equivalents of smolts in these two study categories will be generated. Valid in-river reach survival estimates are generated by handling those PIT tagged fish that partially migrates through the hydrosystem as a subyearling and then continues through the remainder of the hydrosystem as a yearling as follows:

At the last dam where these PIT tagged fish are detected as a subyearling, they will not be considered a return-to-river fish for in-river reach survival estimation purposes. Instead they will be considered a removal in the CJS methodology, and as such they will not bias the estimation of in-river survival in the downstream reaches where they would be migrating as a yearling instead of as a subyearling. The key is to estimate the in-river reach survival components for converting detections at collector dams to Lower Granite Dam equivalents with PIT tagged smolts only during the times they are migrating as subyearlings in any particular reach. The total number of returning adults from these smolts with known detection dates at collector dams (including returning adult from both the full and partial out-migrating subyearlings) divided by their associated PIT tag smolt number in Lower Granite Dam equivalents will be a valid estimate of smolt-to-adult survival rate (SAR) for fall chinook in study categories  $T_0$  and  $C_1$ .

6. For fish in study categories  $T_0$  and  $C_1$ , we know the dates of detection at the collector dams and subsequent partitioning of the data for a given migration season into selected temporal intervals is possible provided enough PIT tagged smolts are available in each temporal interval of interest. If the interest is determining the best management option for the late migrating fall chinook in September and October at the Snake River collector dams, then supplemental PIT tagging at these dams would be required beyond what would be available passing these sites with the PIT tagged fall chinook in our proposal since over 90% of the hatchery fall chinook that would be PIT tagged in our proposal would typically be passed these collector dams prior to September 1. The supplemental PIT tagging may have to be on the scale of nearly all collected subyearling fall chinook during the months of September and October to provide statistically significant comparisons.

7. The CJS method is used to estimate the in-river reach survival rates and requires that all fish used are actively migrating in the same year over the reaches within which the fish are used in the estimation. Response #5 above states how to handle the PIT tagged fish that partially out-migrate as subyearlings and then continue their out-migration as yearlings.

8. Although major differences may occur between hatchery-reared and wild fall chinook regarding timing of passage at Lower Granite Dam, size at time of out-migration, travel time to Lower Granite Dam, smoltification, etc, the real test of whether the hatchery stocks make a good

surrogate for the wild stocks is with regard to differences in SARs between those fish transported versus those fish bypassed to migrate in-river. If the pattern of SARs over years between transported versus in-river migrants is similar for hatchery and wild stocks, then assessing whether or not transportation is helpful as a mitigation tool toward increasing survival through the hydrosystem of listed wild stocks may still be investigated.

## **Second Anonymous Reviewer**

1. We will add more details regarding the fact that subyearling fall chinook may either complete their seaward migration as a subyearling fish, or hold-over (above Lower Granite Dam or in reaches below Lower Granite Dam) and continue their seaward migration as a yearling. The ramifications of the life history and complexities that it adds to analyses of SAR for transported, bypasses, and never detected PIT tagged fish will be added in the next proposal draft.
2. The proposal will be modified to note that the on-going work that is funded by BPA will continue to provide the basic information on migration rate, timing, in-river reach survival rates, etc. The PIT tags to be added under COE funding would be used at the trapping sites in the mainstem Snake and Clearwater rivers to create a group of PIT tagged fish to mimic the untagged run-at-large which is transported from the four collector dams. Although the numbers of PIT tagged wild chinook transported will be too small to obtain SARs with adequate precision to show statistically significant differences between transported and in-river migrants if they exist, the pattern of these differences over years for wild stocks compared to hatchery stocks will help determine whether hatchery stocks make good surrogates for wild stocks with regard to the utility of transportation as a mitigation measure in increasing wild fall chinook survival rates through the hydrosystem. In addition, we propose to compare the patterns of inriver survival (for longer reaches - due to increased marking levels for wild fish) for hatchery and wild stocks as another indicator of how good a surrogate hatchery stocks are of wild populations.
3. With regard to the PIT tagged hatchery fall chinook used in our proposed study, we do not want to control fish size or release timing, but rather make the PIT tag releases as representative of hatchery production as is possible. Since the bulk of the fall chinook in the Snake River basin is of hatchery origin, it is important to determine whether the current program of maximized transportation is beneficial over simply using the bypasses at the collector dams to get fall chinook smolts through the hydrosystem and into the ocean with the highest overall survival possible. This information will be of value to hatchery managers in determining the success of hatchery practices provided the PIT tagged fish adequately represent the run-at-large hatchery production. As stated in response #2 above, we will need to establish whether pattern of survival between transported versus bypassed fall chinook is similar between hatchery and wild fall chinook stocks to determine whether hatchery fall chinook are an adequate surrogate for wild fall chinook when it comes to determining if transportation or bypass passage at collector dams produces the higher SARs.
4. The question of added complexity to handling the fish never detected at any dam has been discussed in the responses #3 and #5 to the first anonymous reviewer. It is true that a good estimate of the population of PIT tagged subyearling chinook arriving at Lower Granite Dam

“destined” to never be detected at any monitored site (collector dam nor non-collector dam nor trawl) is very difficult to achieve because of the fact that fall chinook that start their out-migration as subyearlings may hold up somewhere in the basin and not complete their seaward migration until they are yearlings. This complexity in the fall chinook life history will increase the difficulty in assessing the starting population at Lower Granite Dam of fish “destined” to be in study category  $C_0$ . But one must keep in mind that during the present summer operations, very few PIT tagged smolts are destined to be in study category  $C_0$  if they truly are out-migrating in the summer. With no summer spill at the four collector dams and collection efficiencies around 50% at these dams (Lower Granite, Little Goose, and McNary dams tending to be above 50% and Lower Monumental Dam tending to be below 50%), there is only around a 6% probability of PIT tagged fall chinook subyearlings migrating in-river to McNary Dam tailrace with no detections. The fish that completely hold-over will be migrating out during the spring riverine conditions with higher flows and BiOp spill occurring at each collector dam. The management question of how best to get fall chinook through the hydrosystem in the summer and fall months is not addressed with those fish. That is why under the current riverine and operating conditions, we place the emphasis of this proposal on the PIT tagged fall chinook in study categories  $T_0$  and  $C_1$ . For PIT tagged fall chinook subyearlings in these two study categories, we will have a valid starting number of smolts in each study category for use in estimating SAR for each study category as discussed in response #5 to the first anonymous reviewer.

5. Whether you are estimating the starting population of PIT tagged hatchery stocks or PIT tagged wild stocks in each study category, the problems will be the same, so our response #4 to your previous comment applies here again. One must keep in mind that we are estimating starting numbers at Lower Granite Dam of PIT tagged fish in each study category, not the population numbers of the run-at-large “destined” to be in each category, so we do not understand why the reviewer talks about estimating the numbers of wild female spawners, eggs per spawner, egg to fry survival and fry to parr survival. This method would add a very large amount of uncertainty in any estimate of a starting population

6. This proposal is primarily designed to use hatchery stocks of fall chinook in the SAR evaluations and then to complement those SAR findings with rougher comparisons with wild stocks to determine how well the findings for hatchery stocks may be applied to wild stocks. Through discussions with researchers currently involved with PIT tagging of wild fall chinook stocks in the mainstem Snake and Clearwater Rivers under existing BPA funding, we have come to the realization that the current level of tagging effort could be doubled by our adding PIT tag groups under COE funding to mimic the run-at-large by being transported if collected. This would provide the basis for comparing the trend in SARs between transported and bypasses fall chinook for wild and hatchery stocks as previously discussed in response #3 to the first anonymous reviewer and response #2 above to the second reviewer. This would also give us the ability to compare patterns of inriver survival rates for longer reaches. The details of the logistics and cost will be worked out with the USFWS and NPT researchers that will be working on this task and presented in the next proposal draft.

7. There are more mini-jacks returning from hatchery stocks than from wild stocks, so just as both mini-jacks and jacks were excluded in the “adult” SAR calculations when handling yearling spring/summer chinook in the Comparative Survival Study of the Fishery Agencies and Tribes,

we will exclude mini-jacks for the fall chinook study as well. We define mini-jacks as precocious males returning during the initial migration year with little or not time in salt water, whereas the fish that hold-over and enter salt in their second year of migration in the spring and then return as ripe males after only a short time in salt water would be considered jacks. With this approach our mini-jacks should match what the COE records as mini-jacks in the counting windows at the ladders on the dams. Because jacks can make up a large proportion of the run for fall chinook, we would compute SARs both with jacks included and with jacks excluded for each study category.

8. With PIT tagged subyearling fall chinook we are confident of obtaining valid in-river survival estimates as far downstream as McNary Dam tailrace in each year, but given BiOp summer spill at John Day and Bonneville dams and the unmonitored corner-collector at the second powerhouse at Bonneville Dam and limited operation of the NOAA trawl in the summer months, the ability to estimate in-river survival directly in the lower Columbia River below McNary Dam with any real precision is limited. However, for purposes of computing a delayed mortality value ("D"), we will need to rely on the "survival per mile" method in the lower Columbia River. This method is used only when more direct estimates are not possible. For subyearling fall chinook that originated in the Snake River basin above Lower Granite Dam, the estimates of reach travel time in the lower Columbia River between McNary and Bonneville dams imply that most of the rearing had already taken place before the fish arrive at McNary Dam, since these travel time estimates are often only 4 to 8 days, similar to what had been seen in the springtime for yearling chinook. So it is possible that the "survival per mile" expansion in the lower Columbia River could underestimate the "true" in-river reach survival in that area. However, allowing more fish to migrate inriver would allow for better estimates of survival in the lower Columbia River.

Sincerely, STFA



Dave Statler, NPT



Cindy LeFleur, WDFW



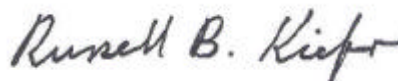
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