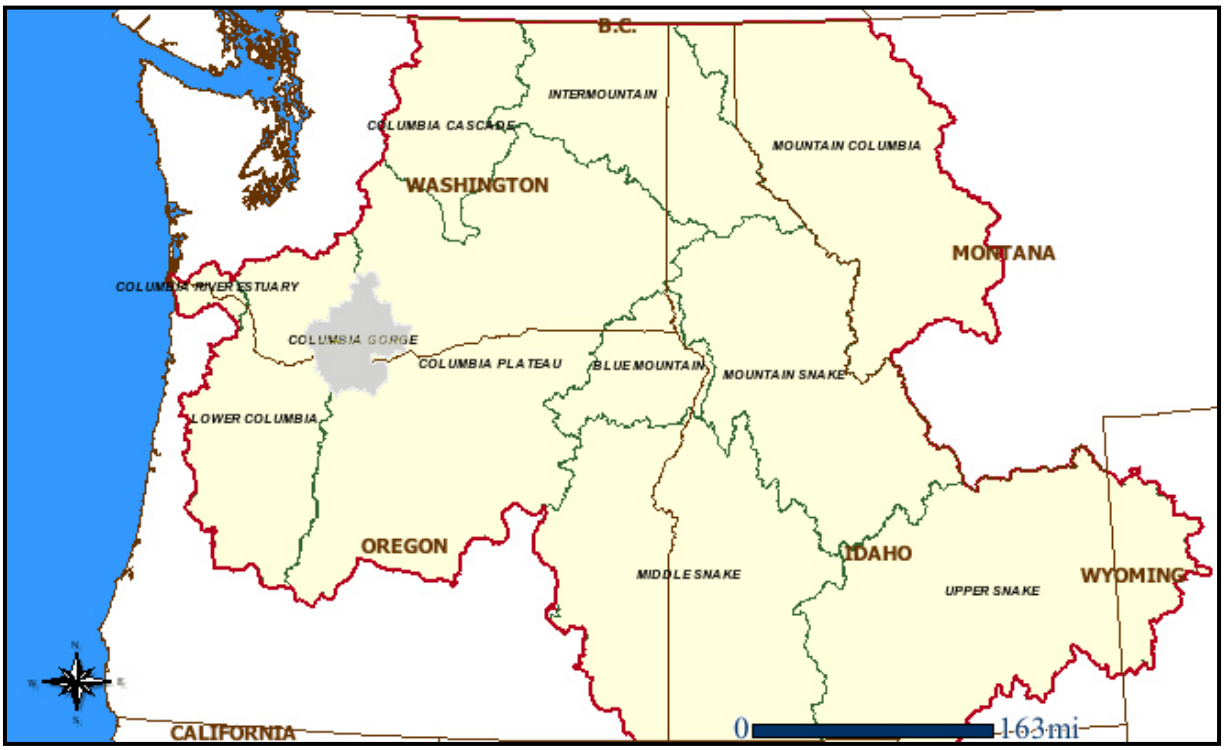
U.S. Fish and Wildlife Service - Pacific Region

Columbia River Basin Hatchery Review Team

Columbia River Basin, Columbia Gorge Province

Little White Salmon, Big White Salmon, and Wind River Watersheds



Carson, Spring Creek, Little White Salmon, and Willard National Fish Hatcheries

Assessments and Recommendations

Final Report, Appendix C:

Comments on Draft Report and Review Team Responses

December 2007

Appendix C: Comments on Draft Report and Review Team Responses

Co-Manager Comments and Responses

Yakama Nation[1]

At this time there are two specific items we wish to bring to your attention for consideration:

1.) An alternative to the placement of a "conservation weir" in the lower White Salmon Subbasin. As the Service is aware, soon the first two years of juvenile chinook DNA analysis will be complete, with a third year of collection scheduled for spring 2008. With information from a complete dataset we suggest a re-evaluation of the conservation weir approach to determine its necessity. The Yakama Nation recommends continued collaboration with the recently formed tribal and multi-agency White Salmon Technical Group to identify possible alternatives. A possible solution may be a smaller conservation weir on Buck Creek (right bank tribe) of White Salmon River to establish a natural tule chinook reserve. Establishing a reserve on Buck Creek would allow for natural re-colonization of the mainstem White Salmon and allow for the continued use of the cold water refugia by migrating upper Columbia and Snake stocks.

Review Team Response: *We agree that all possible options for achieving conservation and reintroduction goals for native species in the (Big) White Salmon River need to be explored following removal of Condit Dam.*

2.) The Yakama Nation conditionally supports the use of Klickitat spring chinook natural production as the preferred stock to re-colonize the White Salmon Subbasin. If natural re-colonization does not occur after passage has been restored at Condit Dam, the geographic proximity of the Klickitat Subbasin and its hydrologic and geomorphologic similarity to the White Salmon make it the natural choice. The Yakama Nation expects our hatchery reform efforts being developed for the Klickitat Subbasin will lead to an abundant spring chinook run that can supply fish for this effort if needed. However, we will need to work with the Service and others to identify the level of production needed and its implications for management in the Klickitat before making a final determination.

Review Team Response: *We agree. Some of our recommendations for spring Chinook, particularly at Little White Salmon NFH, will be contingent upon the Yakama Nation first achieving its within-basin goals for spring Chinook in the Klickitat River Basin.*

[1] *Written comments provided September 17, 2007 by Paul Ward, Manager, Fisheries Resource Management Program, Yakama Nation, Toppenish, Washington.*

Confederated Tribes of the Umatilla Indian Reservation[2]

The Review Team received several editorial comments and suggestions to the initial draft of the Review Team's report (Appendix D), and those suggestions were used to clarify or correct the text of the draft report.

National Marine Fisheries Service (NOAA Fisheries)[3]

The Review Team received several editorial comments and suggestions to the initial draft of the Review Team's report, and those suggestions were used to clarify or correct the text of the draft report.

[2] *Written comments provided August 10, 2007 by Brian Zimmerman, Artificial Production and Passage Programs Supervisor, Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.*

[3] *Written comments provided August 17, 2007 by Rich Turner, Salmon Recovery Division, Hatchery and Inland Fisheries Branch, National Marine Fisheries Service, Portland, Oregon.*

Stakeholder Comments and Responses

Stakeholder Forum[4]

Hood River, Oregon, August 21, 2007

1. Does the Columbia Gorge Report include an economic analysis of the programs reviewed and the benefits and risks they confer?

   ***Review Team Response**: Our reports do not include economic analyses, but they do include assessments of benefits and risks conferred by each hatchery program. Our reviews are intended to be scientific with a focus on the biological requirements of salmon and steelhead resources, both in the hatchery and in the natural environment. Economic evaluations are beyond the mandate of the Team. The Team has provided baseline information on the operational costs of each National Fish Hatchery (Appendix E), including information regarding the harvest and conservation benefits of each hatchery program (Appendix B), to allow readers to assess economic costs and benefits. We anticipate economics and socio-cultural impacts will be considered by the Service in the implementation phase.*

2. Does the USFWS Columbia River Hatchery Review tie into the Columbia River Hatchery Scientific Review Group's (HSRG) review process?

   ***Review Team Response:** Yes. The two reviews complement one another nicely. The USFWS review focuses on detailed evaluations of hatchery operations and the overall benefits and risks of Service programs, whereas the HSRG is providing more of a regional and cumulative review of hatchery programs to meet harvest and conservation goals throughout the Columbia River Basin. The Review Team has scheduled its review to stay a few months ahead of the HSRG, thus allowing Review Team recommendations to be included with HSRG evaluations. Additionally, Review Team members communicate with the Columbia River HSRG on a regular basis, and two members of the Review Team (Don Campton and Tom Flagg) are also members of the HSRG.*

Spring Chinook, Carson NFH

3. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are discussing the expansion of the Walla Walla spring Chinook program in the US v. Oregon process. We would like to see the expansion included as an alternative in the Carson NFH spring Chinook program section. The proposal is to increase the transfer and release of Carson NFH spring Chinook yearling smolts from 250,000 to 500,000 into the Walla Walla River. We do understand that there is some questions regarding straying into the Tucannon River.

[4] *These are excerpts from comments provided by attendees of a Stakeholder Forum held at the Best Western Hood River Inn, Hood River, Oregon on August 21, 2007 and the Water Resources Education Center, Vancouver, Washington on August 22, 2007. Responses were provided by Review Team members who attended the meeting and were clarified in subsequent Review Team meetings.*

***Review Team Response**: Potential straying of returning spring Chinook from the Walla Walla River to the Tucannon River, which supports an ESA-listed population of spring Chinook, is a concern of NOAA Fisheries because of past straying of Carson NFH spring Chinook from the Umatilla River hatchery to the Tucannon River. As a consequence, NOAA Fisheries desires that the outplanting program into the Walla Walla River remain at 250,000 yearlings per year until sufficient return data are available indicating little or no straying of the those outplanted fish into the Tucannon River.*

We also understand that other parties have expressed concerns over the recommendation to increase production at Carson NFH for the Walla Walla program. As Carson NFH is currently rearing at near maximum capacity, increasing production for the Walla Walla program would require a reduction in the number of fish released on-station, potentially reducing the number of spring Chinook available for harvest in the Wind River.

4. Carson NFH Spring Chinook Alternative 5 suggests that Carson NFH could be utilized for rearing spring Chinook for reintroduction into the Big White Salmon River after Condit Dam is removed. Due to its close geographic proximity, Klickitat spring Chinook are considered the stock of choice for reintroduction. This would require the annual collection of broodstock on the Klickitat River. Yakama Nation is in the process of renovating its facilities, which includes adding broodstock collection facilities at Castille and Lyle Falls to enable collection of both hatchery and natural origin spring Chinook throughout the run. However, current facilities are very crude, and the Yakama Nation is looking to bring in BPA [*Bonneville Power Administration*] money for renovations.

   ***Review Team Response:** The Review Team's recommendations involving Klickitat spring Chinook are contingent upon infrastructure improvements to the Yakama Nation's program within the Klickitat River. The Review Team recognizes a potential collaboration between the Service and the Yakama Nation to achieve mutual interests and goals.*

5. Has there been any discussion among Team members regarding recycling Carson NFH Spring Chinook to give Wind River anglers another shot at them?

   ***Review Team Response:** The Team understands that recycling is not very cost effective as the spring Chinook move quickly from Shipherd Falls to Carson NFH. Additionally, fish health issues are associated with recycling spring Chinook through fisheries (e.g., increased incidence of bacterial kidney disease due to handling stress).*

6. To further reduce any potential impacts to the native steelhead population, and given that hundreds of adult Carson NFH spring Chinook escape and attempt to spawn naturally in the Wind River, I would suggest that as many Chinook as possible be removed from the river by seining.

   ***Review Team Response**: The Review Team has made a number of recommendations to reduce the risk of natural spawning by hatchery-origin spring Chinook (see recommendations associated with Issue CA5 of our report). To address those concerns, the Review Team has recommended (a) that the ladder to the hatchery remain open during the entire time that spring Chinook are migrating upstream, (b) installation of a one-way trap in the fish ladder at the hatchery to prevent adult fish from moving back into the river after they have entered the hatchery, (c) potential use of a temporary weir or manual seining in the immediate vicinity of*

the hatchery to remove as many spring Chinook from the Wind River as possible, and (d) use of PIT tags to update in-season monitoring of adult returns at Bonneville Dam and at the hatchery.

7. As part of the recommended alternative for nearly every program in the report, there is a segment for supporting the reintroduction of salmon into the Big White Salmon after Condit Dam is removed. At times, this segment appears to conflict with the other portions of recommended alternative.

   Review Team Response: *With multiple facilities available in the region for supporting the reintroduction of salmon into the Big White Salmon River, the Team felt it was important to list this as a recommendation where feasible and let the managers decide where to implement the programs based on facility and regional priorities. The Team has worked to clarify these options in the revised report. .*

Tule Fall Chinook, Spring Creek NFH

8. Why would the reintroduction of chum in the Big White Salmon be considered if Bonneville is a barrier to passage?

   Review Team Response: *Chum salmon do pass Bonneville Dam, although possibly not with the same efficiency as Chinook or coho. A bigger problem is that the pool behind Bonneville Dam has flooded much of the low gradient habitat which chum used historically for spawning. The Team believes that appropriate habitat may be available for chum recolonization in the Big White Salmon River after Condit Dam is removed. If rearing of chum salmon is required for reintroduction, it may make sense to rear the chum in particular at Spring Creek NFH because (a) the facility is not well designed for over-summer rearing (due its dependence on the water-reuse system) and (b) chum fry migrate downstream to the ocean within one to two months after hatching.*

9. We are concerned about the impacts of stray upriver bright fall Chinook superimposing on tule fall Chinook redds in the Big White Salmon River. Where are the upriver bright fall Chinook coming from?

   Review Team Response: *The stray upriver bright fall Chinook come from Bonneville Hatchery and Little White Salmon National Fish Hatchery. The Team agrees that straying is an issue and that it will have to be controlled (see recommendations SC4b and LW4a, b for Spring Creek and Little White Salmon National Fish Hatcheries, respectively).*

Upriver Bright Fall Chinook, Little White Salmon NFH

10. I understand the philosophy of the stepping-stone concept outlined as an alternative to the existing upriver bright fall Chinook program at Little White Salmon NFH. However, there may be legal issues with Grant County regarding obtaining Priest Rapids broodstock. Grant County has refused to pay for broodstock to support John Day mitigation for proposed releases of URB [*upriver bright*] fall Chinook in the lower part of the Klickitat River.

Review Team Response: *We concluded that the annual transfer of 1.7 M juvenile URB fall Chinook from Little White Salmon NFH to the Yakima River is inconsistent with conservation goals for natural populations in the mid-Columbia region. Those risks are related to the ancestry of the broodstock at Little White Salmon NFH, which was derived from adults of unknown origin trapped at Bonneville Dam in the 1970's. One goal of the transfer program is to restore naturally spawning populations of fall Chinook in the Yakima River. The most appropriate stock for achieving that goal, outside of a native Yakima River stock, would be Priest Rapids fall Chinook. Consequently, if Little White Salmon NFH is going to continue to assist with achieving both harvest and restoration goals for fall Chinook in the Yakima River, then the Team believes the appropriate stock should be used. Funding for the program is a separate issue that will require cooperative agreements among the comanaging and funding agencies, tribes, and Grant County Public Utilities District (PUD).*

11. Why is there not an alternative to convert only the Yakima River portion of the Little White Salmon NFH upriver-bright fall Chinook program to Priest Rapids stock versus the Team's current alternative to convert the "entire" program to a stepping stone program utilizing Priest Rapids broodstock?

    Review Team Response: *Your proposal has some merit and could represent a short-term strategy during transition to a new broodstock. However, the Team was concerned that maintaining two distinct broodstocks at Little White Salmon NFH would be extremely difficult since two broodstocks with similar timing would have to be handled simultaneously. It is conceivable to collect and spawn adults for the Yakima River program at Priest Rapids Hatchery (or the Yakima River from returning fish), transfer 2 million eyed eggs to Little White Salmon NFH for hatch and rearing, and then transfer the resulting fish (approx. 1.7 M) to the Yakima River for acclimation and release. The on station release could then retain the current broodstock with a much smaller program intended to support a terminal fishery in Drano Lake independent of the Yakima River program. [Review Team Note: The Team modified its initial recommendations regarding URB fall Chinook at Little White Salmon NFH in response to comments to its draft report and recent comanager developments. The Team now recommends, as a long-term goal, changes similar to those outlined in our response above, with minimal or no releases of URB fall Chinook into the Little White Salmon River from Little White Salmon NFH.]*

12. There is still some question as to how many wild fish are really in the Priest Rapids broodstock. How "integrated" is the existing program really?

    Review Team Response: *The Priest Rapids Hatchery program is operated by WDFW (Wash. Dept. of Fish and Wildlife) with funding from Grant County PUD. The broodstock is intended to be genetically integrated with naturally-spawning fall Chinook in the Hanford Reach area. We understand that the number of natural-origin fish included with the broodstock may not be sufficient to meet genetic management goals for an integrated broodstock. We anticipate that the HSRG (Hatchery Scientific Review Group) will determine whether the broodstock is adequately integrated during its review of that program.*

Spring Chinook, Little White Salmon NFH

13. How will the popular Drano Lake spring Chinook fishery be impacted by the recommend alternative for the Little White Salmon NFH spring Chinook program?

    Review Team Response: *The Team has noted the importance of the Drano Lake spring Chinook fishery and does not recommend reducing the on-station release of spring Chinook from Little White Salmon NFH that creates this fishing opportunity. The Team believes the spring Chinook program is well segregated. However, the current program poses some risks to naturally spawning populations in the area and may be inconsistent with the long-term strategy of reintroducing spring Chinook into the Big White Salmon River utilizing the Klickitat River stock. Consequently, as a long-term strategy, we recommend maintaining one stock for release into the Little White and Big White Salmon rivers and then propagate the Carson NFH stock as a physically and genetically segregated stock in the Wind River.*

Vancouver, Washington, August 22, 2007

Carson NFH Spring Chinook

14. Every alternative for the Carson NFH spring Chinook program, save one, includes the option to reduce the program. Please explain.

    Review Team Response: *Each of the alternatives, aside from Alternative 1 (maintain current program) and Alternative 6 (terminate program), includes the initiation of a new program at Carson NFH (e.g., summer steelhead, Big White Salmon River spring Chinook). Since Carson NFH is currently at maximum rearing capacity, the Team recommended that the facility either be expanded, or the existing spring Chinook program be reduced to accommodate those potential new programs. The current water supply, Tyee Creek, is also a limiting factor. Water from the Wind River is available for expanded production, but regular use of Wind River water could create additional problems (e.g., reduced instream flows in the immediate vicinity of the hatchery during the summer, fish health issues because anadromous fish would be in the water supply). Currently, Wind River water is not used regularly but is available for emergencies. In addition, surplus spring Chinook in excess of broodstock needs return to the hatchery consistently, and a reduction in on-station releases coupled with increased fishing access in the Wind River (see Recommendation CA2) could reduce the number of surplus fish without affecting the number of harvested fish.*

15. How often are there surpluses? I am concerned about alternatives that suggest reducing the size of the program.

    Review Team Response: *The Team is not advocating reducing the size of the program. We are very aware of the importance of the program to the tribes. The alternatives should really state "reduce on-station releases" of spring Chinook to accommodate spring Chinook releases elsewhere, not reduce the size of the program. For our recommended alternative, the Team recommends a "temporary" reduction of up to 250,000 smolts for annual on-station releases, limited to three generations (12 years), to potentially accommodate reintroduction of spring Chinook into the Big White Salmon River. However, Little White Salmon NFH may be*

a more appropriate facility to accommodate those reintroductions. On-station releases at Carson NFH have already been reduced from 1.42M to 1.17M smolts to accommodate reintroduction and transfer of 250,000 spring Chinook smolts to the Walla Walla River. The Review Team believes that terminal harvests of spring Chinook in the Wind River are currently limited primarily by access, not by the size of the program or on-station releases.

16. If the program is reduced for the purpose of reducing the number of spring Chinook that stray into the Wind River, then the tribes may support this action; however, if it is a general program reduction (to make room for other programs), then this will raise a red flag with the tribes.

    Review Team Response: *We understand the tribal need to maintain harvest opportunities. We also understand that the Service's hatchery programs in the Gorge region were established as mitigation for mainstem Columbia River dams (i.e., to replace lost fishery resources). The Team identified the capability of utilizing rearing space for reintroduction of spring Chinook in the Big White Salmon as an alternative at Carson NFH. This alternative could instead be implemented at Little White Salmon NFH depending facility and program priorities. Any short-term reduction of on-station releases for the reintroduction program would, in the long term, provide for additional tribal and non-tribal fishing opportunities in the Big White Salmon drainage.*

<u>Spring Creek Tule Fall Chinook</u>

17. What is the current trend in spring water availability to the facility? My understanding is that the level of water available is decreasing. The water comes from the aquifer and is not influenced by climate; however, additional draws from the aquifer (from development, etc.) could affect what can be produced there.

    Review Team Response: *The water supply historically has fluctuated, but we see no evidence of a long-term declining trend. For example, in 2007 the facility saw an increase in its water supply from 2006. Our understanding is that the facility can support a program of 10.5 million subyearling fall Chinook smolts at recommended densities with the available water, taking into account the biological reuse system. In terms of water supplies, the four Gorge facilities (Little White Salmon NFH, Willard NFH, Spring Creek NFH and Carson NFH) are believed to be relatively stable.*

18. Regarding the recommended alternative for Spring Creek NFH tule fall Chinook, there have been comanager discussions regarding the use of that stock for mitigating the impacts of John Day Dam. John Day and The Dalles dam mitigation programs are starting to be grouped together in regards to funding. Although upriver bright fall Chinook may be more aligned with John Day dam mitigation, if The Dalles and John Day dam are looked at together, both upriver bright fall Chinook and tule fall Chinook were affected by those projects and have to be mitigated for. I think it is important to include the concept that the production of tule fall Chinook does address mitigation for John Day and The Dalles dams. Furthermore, the Team may want to include a statement in their recommended alternative such as "keep track of mitigation negotiations to guide the future of the program".

Review Team Response: *We agree with this perspective, although upriver-bright fall Chinook were probably impacted by The Dalles and John Day dams to a much greater extent than were tule fall Chinook. The Team will incorporate these clarifications in the finalized report.*

19. Have you compared theoretical smolt-to-adult survival rates of the recommended reduced tule fall Chinook program size (10.5M) to the survival rates associated with the current level of production (15.1M)?

    Review Team Response: *We assume the smolt-to-adult survival rates will be approximately equal for a 10.5M release versus a 15.1M release. These assumptions are documented in the AHA spreadsheets (Appendix A). We should note also that there is the additional assumption that the 4.6M reduction in smolt releases at Spring Creek NFH could be made up at Bonneville Hatchery as a new 4.6M smolt release, as proposed under "Spring Creek reprogramming." We have also included a recommendation to pursue this analysis further (see Recommendation SC8b).*

20. Have catastrophic losses occurred from disease associated with current rearing densities?

    Review Team Response*: No. The last catastrophic loss occurred in 1985 when upriver bright fall Chinook were brought into Spring Creek NFH. At that time, the additional fish and poor water quality – caused by semi-functional filter beds, minimal pond flow, overfeeding, and other factors – stressed the fish and bacterial gill disease erupted, causing mortalities as high as 50%. At current rearing parameters, there have been no catastrophic fish losses, and annual losses to disease have been minimal. In the past eight years (2000 – 2007), parasitic infections of Ich (Ichthyophthirius* sp.*), bacterial gill disease, and a false positive diagnosis for IHNV (Infectious Hematopoietic Necrosis Virus) triggered four early release events to reduce the spread of those pathogens and avert potential disease catastrophes. However, even in those years of early releases, on-station mortalities were within normal or predicted expectations. Reduced rearing densities will reduce the fish health risk even lower.*

21. I am confused about the production numbers of tule fall Chinook at Spring Creek NFH. What was the team envisioning regarding the breakdown of how many tules would be reared where and for what program?

    Review Team Response: *We envisioned that the maximum capacity of Spring Creek NFH is 10.5 million subyearling smolts, of which up to 350,000 subyearlings could be used for reintroduction and direct release into the Big White Salmon River. The remaining 10.15 M smolts would be released on-station as a continuation of the current program. Big White Salmon ponds, located along the east bank of the lower Big White Salmon River, could also be rehabilitated and used to provide rearing space for 350,000 subyearling fish, thus allowing for an on-station release of the full 10.5 M fish under our Team's recommendations.*

<u>Little White Salmon Upriver Bright Fall Chinook</u>

22. Is there any issue with collecting upriver bright fall Chinook from the Yakima River itself as broodstock versus utilizing Priest Rapids stock?

Review Team Response: *While the Team recommends utilizing upriver bright fall Chinook from Priest Rapids Hatchery or other suitable mid-Columbia facility for supporting the Yakima River program reared at Little White Salmon NFH, we understand that the Tribe may prefer collecting Chinook for broodstock from adults returning and trapped in the Yakima River. The Team believes that this is a sound alternative; however, we are unsure whether adequate numbers of broodstock are available currently for collection at the Prosser Dam trap. The Team recommends transitioning to a local broodstock source in the Yakima River as soon as feasible.*

23. Regarding straying of URB fall Chinook into the Big White Salmon River, has there been any discussion in the U.S. vs. Oregon deliberations about a directed fishery on URBs in the lower Big White Salmon River?

    Review Team Response: *The Team was advised that there has not been much discussion about a directed fishery on URBs in the Big White Salmon. A weir in the lower Big White Salmon would also address some of the concerns regarding URB strays entering the Big White Salmon River (see also Recommendation LW4a).*

24. At one point, the Service attempted to rear tule fall Chinook at Little White Salmon NFH; however, survival rates were very low. I would not include or consider the alternative to replace the existing upriver bright fall Chinook program with a tule fall Chinook program at Little White Salmon NFH.

    Review Team Response: *The Team included that alternative to acknowledge that all relevant options addressing regional needs were considered.*

<u>Willard NFH Coho</u>

25. The Team should emphasize in Alternative 2 that reestablishment of a coho release-harvest program at Willard NFH will probably not require termination of the current Willard coho program that supports the Yakama Nation's coho reintroduction program in the Wenatchee River.

    Review Team Response: *The Team agrees that Willard NFH should continue to accommodate the needs of the Yakama Nation for reintroducing coho to the Wenatchee River, if desired by the tribe, and that reestablishment of a coho release-harvest program at Willard NFH should not affect the ongoing coho reintroduction program. In this context, the Review Team also noted that propagation of White River spring Chinook (Wenatchee River watershed) at Little White Salmon or Willard NFHs, which is another program being added to those facilities, should not affect the tribal coho program at Willard NFH.*

Native Fish Society[5]

Shipherds Falls Fishladder:

1. In the 1950s a fishway was constructed at Shipherds Falls to provide passage for hatchery spring chinook. The first returns were in 1959. The fishway is an infrastructure associated with the hatchery development for hatchery spring chinook development in Wind River; however, there is little discussion of its potential impact on native summer steelhead. Shipherds Falls was a major selective factor on wild native summer steelhead in Wind River and may have promoted morphological adaptations to successfully spawn in the river. Before the introduction of hatchery steelhead into Wind River and other adjacent watersheds, it was common for tackle store operators to identify one's catch based on the appearance of the fish from Wind River and other streams. The Wind River fish were uncommonly large and also had large caudal fins.

   Review Team Response: *From the documented records, we do not know whether the mean size of summer steelhead returning to the Wind River has decreased since construction of the fishway. In response to our query on this subject, we received the following response from the Washington Department of Fish and Wildlife (WDFW).—"The answer is, we do not know whether mean size has decreased. A request and search for old trap records from when the trap was operated by NMFS has been unsuccessful. A preliminary look at the most recent seven years of data suggest there is large annual variability in ocean ages (chi-square=145.7, df=24, probability < 0.001). Therefore, statistical analysis of pre and post fish ladder data will be problematic unless we can define a biologically significant difference before testing" (i.e., that takes into account the natural inter-annual variability in age class structure and mean sizes of returning adults).*

2. Also, Shipherds Falls created a hydrological barrier and prevented winter steelhead from entering the reproductive areas for summer steelhead above the falls. With the addition of the fishway, winter steelhead, fall chinook, spring chinook, coho salmon and Columbia Basin hatchery steelhead strays have access to the Wind River above the falls. It can be expected that these non-native salmonids have an ecological impact on native, wild ESA-listed summer steelhead in Wind River. -- During the time when spring Chinook are migrating up the Wind River, they overlap with winter steelhead and summer steelhead. There is a trap at the upper end of the fishway that should be used during this time period to sort fish. The purpose would be to remove winter steelhead. By taking this action, the wild, native summer steelhead would be protected from interbreeding with winter steelhead.

   Review Team Response: *According to WDFW, the fishway is open year round, and the trap is operated June 1 through April 30 (Dan Rawding, WDFW, pers. comm.). The trap is not operated approximately May 1 through May 31. When the trap is operated, only unmarked (natural-origin) summer steelhead, unmarked winter steelhead, and spring Chinook are passed upstream. Unmarked winter steelhead are passed upstream for two reasons: (1) inability to accurately distinguish summer and winter steelhead when both strains are migrating upstream at the same time and (2) some winter steelhead may have ascended the falls historically. Winter steelhead currently represent 3 to 11% (annual mean = 6%) of wild*

[5] *Written comments provided September 12, 2007 by Bill M. Bakke, Director, Native Fish Society, Portland, Oregon.*

steelhead in the Wind River, so the ecological impacts of increased passage at Shipherd Falls is considered minor. Fall Chinook and coho are not passed upstream, and neither species is migrating upstream in May when the trap is not operated. No hatchery fish are passed upstream except for spring Chinook. Consequently, based on the information provided by WDFW, increased ecological risks to ESA-listed summer steelhead would be due primarily to introduced spring Chinook and increased passage of winter steelhead.

3. If Carson Hatchery is to continue operating and releasing non-native spring chinook into Wind River the fishway will continue to operate, but once the spring chinook run has passed the falls, the fishway should be closed, allowing only summer steelhead to jump the falls and once again be a selective factor on steelhead. … By closing the fishway, following spring chinook passage, the wild summer steelhead would be more likely protected from non-native fish such as coho salmon, fall chinook and Columbia Basin hatchery steelhead strays through the remainder of the year.

   Review Team Response: *Closure of the fishway after spring Chinook migration is complete is not recommended because a multi-agency agreement is in place to monitor, capture, and mark migrating summer steelhead to estimate their abundance in the Wind River. The Review Team believes that the current operation of the fishway and trap does provide an important monitoring assessment tool for ESA-listed steelhead.*

Non-Native Spring Chinook Impacts on ESA-listed Wild Summer Steelhead:

4. The assessment notes that non-native spring chinook pose a potential disease transmission and ecological impact on wild summer steelhead. Both of these issues are serious concerns for ESA-listed summer steelhead. No disease transmission has been identified affecting wild summer steelhead, however, you know as well as I do, that there is very little effort to identify such impacts from hatchery fish on wild fish. There could be disease impacts that go unnoticed due to the lack of monitoring, and since this work can be expensive it is unlikely that disease impacts will be monitored in the future just as they have not been in the past. Consequently, the impact of disease is an unquantified threat to ESA-listed steelhead. It is only a matter of time before disease impacts are of such a magnitude that they are noticed. Consequently, I found the discussion of disease impacts from artificial production of spring chinook to be weak and there is no plan established in the assessment recommendations to deal with one when it happens.

   Review Team Response: *The Service established a National Wild Fish Health Survey in 1996 to investigate pathogen profiles in a wide range of fish species in the wild (http://www.fws.gov/wildfishsurvey). Using state of the art procedures for detecting pathogens (e.g., DNA methods), naturalized spring Chinook, whitefish, sculpins, rainbow trout, and limited numbers of steelhead have been sampled from the Wind River at various sites above and below the hatchery on an annual basis since 1997. To date, no detectable transmission of pathogens has been detected from hatchery spring Chinook to the wild fish populations in the Wind River. Nevertheless, the Review Team recognizes the potential ecological risks, including disease risks, to ESA-listed steelhead imposed by adult salmon spawning in the Wind River and have recommended the potential use of seining or a temporary weir to remove as many in-river spring Chinook adults as possible. Based on the results of fish health*

monitoring at Carson NFH, the hatchery's juvenile production poses little or no disease risk to the wild populations at this time.

5. Naturally spawning spring chinook in Wind River creates an ecological impact on wild summer steelhead through competition for available food and space. In 2004, 726 naturally spawning spring chinook were identified in the river (page 31). And in 2005, 306 naturally spawning spring chinook were identified. A few of these chinook were natural-origin fish which suggests that at least some spring chinook are reproducing successfully. However, Carson spring chinook are not known for their reproductive success as natural spawners. The assessment report states that [the geometric mean number of] naturally spawning spring chinook [in the Wind River] per year for brood year 1990-1999 was 195. The important factor is that there are naturally spawning spring chinook competing with wild steelhead for food and space in Wind River and there should be none. Even though naturally spawning spring chinook may not produce many adults, they can produce juveniles that compete with juvenile steelhead. The ecological impact of naturally spawning spring chinook on wild summer steelhead is an unquantified issue that should be addressed with a monitoring and evaluation program. The recommendation is to include such a program in the preferred recommendations with options for reducing the impacts.

   Review Team Response: *Biologists from the U.S. Geological Survey (USGS) are actively studying ecological interactions between summer steelhead and spring Chinook in the Wind River (see Appendix B). Hundreds of hatchery-origin spring Chinook spawn in the immediate vicinity of the hatchery in the Wind River each year, and those fish do produce natural-origin offspring. However, juvenile-to-adult survival is extremely low, and a naturalized population of spring Chinook has not been established despite approximately 45 years of hatchery propagation (see Section E under Carson NFH spring Chinook in Appendix B). Moreover, the principal spawning areas for summer steelhead are several kilometers upstream of the hatchery (see graphs in Appendix B), whereas the principal spawning areas for spring Chinook are in the immediate vicinity of the hatchery. The recent, ongoing studies of ecological interactions in the Wind River suggest that direct competition between juvenile spring Chinook and summer steelhead is minimal, both spatially and temporally, and may not be as significant as speculated previously. The Lower Columbia Fish Recovery Board came to a similar conclusion.*[6]

6. The assessment report recommends that a weir be establish at the hatchery to collect all spring chinook. This weir should be a priority, but it will not eliminate the [competition] problem [with steelhead], for there is ample spawning habitat for spring chinook below the hatchery and they have been seen using those areas.

   Review Team Response: *The principle spawning area for summer steelhead is several kilometers upstream of the hatchery, whereas spring Chinook spawn primarily in the immediate vicinity of the hatchery. The Review Team has modified the recommendation to also examine the feasibility of seining in attempt to remove as many hatchery spring Chinook as possible from the Wind River.*

[6] *Lower Columbia Fish Recovery Board. 2004. Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan. Volume II-Subbasin Plan, Chapter J-Wind, p. J-103. Longview, WA.*

Hatchery Water Withdrawal From Wind River:

7. I remember spring chinook having passed the entrance of the hatchery fishway and becoming stranded in Wind River adjacent to the hatchery due to low flows caused by water diversion from the river for the hatchery. The assessment reports the water diversion screen does not meet fish protection specifications, but once fixed it can still be used to divert water from Wind River. The problem of dewatering Wind River and imposing a passage barrier to wild summer steelhead will continue. The assessment report does not discuss this issue. I recommend that this issue be resolved so that when water is diverted it no long represents a passage barrier to migrating steelhead. We support converting the hatchery water right to an instream water right in Wind River.

   Review Team Response: *At the present time, spring-fed Tyee Creek meets all the fish culture needs at Carson NFH. Wind River water is currently considered an emergency back-up water source and has not been used to meet on-station fish culture needs in several years. The Review Team does recommend that the Service upgrade the river intake screen to NOAA Fisheries specifications if the Wind River is to continue to be viewed as an emergency water source. The Review Team does not envision the dewatering of the Wind River by Carson NFH as a likely occurrence in the foreseeable future.*

Spring Chinook Harvest And Impacts On Wild Steelhead:

8. The assessment report states that in 2001 almost 5,000 and 1,800 spring chinook were harvested in recreational and tribal fisheries respectively in Wind River. The mean sport and tribal harvests for 1989-1998 were 2,615 and 868 spring chinook respectively. The assessment report does not discuss the incidental mortality on wild ESA-listed steelhead in these fisheries. The by-catch of ESA-listed summer steelhead is caused by the enhancement of hatchery spring chinook in Wind River, so the by-catch and associated mortality to summer steelhead is directly related to the existence of the hatchery program. I recommend that the assessment report include an action to determine the by-catch and associated mortality on ESA-listed summer steelhead in Wind River and to present options for reducing this mortality. This fishery could be selective for early returning steelhead, reducing genetic diversity, and it can have an impact on steelhead recovery by reducing steelhead spawner abundance. The wild steelhead run in Wind River has been substantially reduced and one year only 49 adult fish were counted. It is possible that this fishery has a large impact on wild steelhead and impedes recovery of this ESA-listed species.

   Review Team Response: *We agree that the incidental by-catch and mortality of summer steelhead in fisheries targeting spring Chinook needs to be understood. WDFW has provided us with the following information on this issue: "Estimates of recreational fisheries impacts to Wind River summer steelhead are found in the NOAA-Fisheries approved Lower Columbia River Fisheries Management and Evaluation Plan (FMEP; see excerpt from Table 12 of the FMEP on the following page)." WDFW estimates that 23% of all upstream-migrating summer steelhead are encountered by anglers in recreational fisheries targeting steelhead, salmon, and resident trout, with a combined expected incidental mortality or total exploitation rate of 3%. Unfortunately, incidental harvest rates on steelhead in tribal fisheries are not readily available, and we have added acquisition of that information to our recommendations in our finalized report.*

Table provided by WDFW: Anticipated encounters (AE) and expected mortality (EM) rates on winter and summer steelhead in the Wind River from recreational fisheries targeting steelhead, salmon, resident trout, and warmwater fish species (e.g., smallmouth bass).

	Fisheries									
	Steelhead		Salmon		Res. Trout		warmwater)			
Affected stock	AE[1]	EM[2]	AE	EM	AE	EM	AE	EM	Harvest[3]	Total
Wind River										
Winter steelhead	30%	1%	40%	3%	17%	2%	0	0	0	6%
Summer steelhead	<10%	1%	<10%	1%	<3%	<1%	0	0	0	3%

[1]Anticipated Encounters (AE) are catch and released fish. These numbers represent the number of fish from a stock anticipated to be incidentally encountered by anglers of a particular fishery.
[2]Expected Mortality (EM) is the hooking mortality of incidentally caught fish, based on (WDFW 2000). Expected mortalities are included in Anticipated Encounters in terms of take.
[3]Harvest is the expected recreational harvest based on historic recreational catch and future run size projections.
[4]Total take encompasses Anticipated Encounters and expected recreational harvest. This can be construed as the exploitation rate.

Cost Accounting for Spring Chinook:

9. The assessment report discusses the benefits of harvest in terms of fish caught. However, the assessment does not include a cost to catch analysis for the hatchery product. An important part of any hatchery evaluation is the cost of operations and a part of that cost is the cost to produce a fish that is harvested in the various fisheries. The assessment supports additional investments of cash into upgrading the hatchery facility. Since this facility was created to enhance spring chinook harvests, it is only appropriate to display how much investment is required to provide the benefit of a harvested spring chinook. Since the Service is using public money to operate and upgrade this hatchery the public should be a full cost accounting of not only the expense, the need, and the benefits, but the actual cost of providing the benefit.

   Review Team Response: *As we have noted elsewhere, our reviews are focused on a scientific evaluation of our hatchery facilities, operations, and programs relative to comanager conservation and harvest goals. Our reports do include a summary of the total annual operating budget for each of our facilities (Appendix E), and interested parties can use that information to perform their own evaluations of the benefits and costs of each program. We have evaluated the hatcheries in a manner similar to the way we evaluate habitat: that is, with the goal of maximizing the viability of fish populations that depend on those facilities and/or habitat for survival. The economic cost of maintaining facilities or habitat is not part of our biological evaluations because we defer those economic considerations to the implementation phase of this process.*

Size Spring Chinook Releases To Reduce Impacts on ESA-listed Steelhead:

10. Hatchery spring chinook survival averages 0.2% (SAR). From 1990-1999 2,575 spring chinook were surplus to hatchery needs and were given to the tribes. From 1955-1998 about 2 million spring chinook juveniles were released and since 1998 about 1.42 million are

released[7]. Hatchery releases are designed to compensate for the poor survival of the hatchery product and fulfill hatchery obligations such as provide spring chinook for reintroduction to other rivers such as the Walla Walla. However, the huge surpluses of adult chinook suggest that too many juveniles are being released to meet the hatchery needs and other uses. Since the spring chinook can have an impact on wild ESA-listed steelhead through ecological competition, disease transmission, and incidental mortality in various fisheries, the assessment report should review the number of spring chinook released in order to reduce these impacts. I was surprised that this issue was not evaluated by the science team, for it is an obvious issue affecting hatchery operations.

Review Team Response: *We provided a number of recommendations to reduce the number of surplus spring Chinook adults returning to Carson NFH and the number of hatchery-origin fish spawning in the Wind River. These recommendations include (a) coordination with WDFW and local watershed groups to provide recreational and tribal fishers with additional or improved access points to the Wind River; (b) installation of a trap in the ladder at the Carson NFH so that fish entering the ladder cannot back out; and (c) investigation of the feasibility of a weir or hand-seining of adult fish from the river to preclude upstream passage of spring Chinook to natural spawning areas for steelhead upstream of the hatchery. The scientific data available to date (USGS studies; Appendix B) suggest that the current size of the spring Chinook program at Carson NFH is not negatively affecting the viability of summer steelhead through ecological interactions or disease transmission, although incidental harvest mortality of steelhead in fisheries targeting spring Chinook needs to be quantified (see our response to comment #9 of the Native Fish Society). On the other hand, increased nutrient inputs from decaying salmon carcasses could be benefiting survival and growth of juvenile steelhead in the Wind River as demonstrated recently in a controlled study with carcass analogs (Mesa et al. 2007[8]).*

<u>Size Of Spring Chinook Releases and Predator Response:</u>

11. The assessment report does not discuss the potential impact of spring chinook releases on wild steelhead related to predator attraction. This ecological issue is not mentioned and the report does not propose to monitor and evaluate it, so there are no options to reduce the problem if one exists. A number of studies have been conducted on predator attraction to hatchery released salmonids. Research by the USFWS on hatchery releases in the upper Columbia River identified predator attraction that harmed wild salmonids and they even gave it a name: the Pied Piper Effect. … Predator attraction is an impact of the non-native spring chinook hatchery program and its impact on ESA-listed steelhead should be evaluated. Options to reduce this impact, whatever its size, should be presented.

    Review Team Response: *Concerns regarding attraction of predators by hatchery fish are generally focused on the release site where concentrations of juvenile fish can be several*

[7] *Review Team note: At the present time, 1.17 million smolts are released on station and 250,000 yearlings are transferred off-station for reintroduction of spring Chinook in the Walla Walla River, thus resulting in a total production of 1.42 M yearling spring Chinook at Carson NFH.*

[8] *Mesa, M.G., C.D. Magie, T.C. Robinson, E.S. Copeland, and P.J. Connolly. 2007. Nutrient assessment in the Wind River watershed: Report of Phase III activities in 2006. Prepared for Lower Columbia Fish Enhancement Group (Camas, WA) and Lower Columbia Fish Recovery Board (Longview, WA). U.S. Geological Survey, Western Fisheries Research Center, Columbia River Research Laboratory, 5501A Cook-Underwood Road, Cook, WA 98605. 53pp.*

times greater than the concentration of smolts from natural populations. At Carson NFH, smolts are released into a hatchery side channel that is physically removed from the main river where natural-origin steelhead smolts occur. We have no evidence to date that the release of spring Chinook yearlings into the Wind River is attracting predators that feed on steelhead smolts, although formal monitoring has not been conducted. The USFWS has monitored predator attraction during release of juvenile spring Chinook from Warm Springs NFH through underwater videography. A similar monitoring approach could be taken at Carson NFH to assess the presence of predators and extent of predation.

12. In addition, the release of 1.42 million spring chinook into the Columbia River and its impact on wild salmonids is not addressed in the assessment. This review, like most such reviews, confines its impact analysis to the particular subbasin where the action agency is evaluating its foot print. To be comprehensive such a review should evaluate the cumulative impact created within and outside the subbasin where the project is located. It is, for example, a known fact that cormorants begin staging in Young's Bay two weeks prior to annual releases of salmon from the hatchery. Research on estuaries has shown predator attraction to hatchery fish releases and impacts on wild salmonids. There is, of course the issue of Caspian terns on the lower Columbia River. In terms of predator attraction to hatchery fish releases, this assessment report does not address out-of-basin effects and therefore presents an incomplete cumulative impact analysis. The assessment report should acknowledge this problem and address it, providing options to reduce the impacts.

    Review Team Response: *We hypothesize that the "staging" of predators in the Columbia River estuary (e.g., Caspian terns on Sand Island) would occur regardless of whether the outmigrating fish are of hatchery or natural origin. Indeed, we suggest that predation on outmigrating smolts in the mainstem Columbia River and estuary has been influenced substantially more by habitat changes in the Columbia River (e.g., mainstem dams, tidal gates, dredging, islands created from dredging spoils, etc.) than the development of a hatchery system intended to replace natural spawning and rearing areas. In this context, if we double the number of smolts and returning adults within a watershed, we will also increase competition and potential predation effects regardless of whether those increases reflect hatchery propagation or natural reproduction. NOAA Fisheries is currently assessing "cumulative impacts" and use of the Columbia River estuary by hatchery and natural-origin fish. We believe those ongoing studies by NOAA Fisheries will determine the degree to which hatchery and natural-origin smolts congregate in the Columbia River estuary and are potentially exposed to predators during outmigration bottlenecks.*

<u>Cold Water Sources And Its Value To Wind River Wild Steelhead:</u>

13. Carson National Fish Hatchery has captured Tyee Springs, a cold water source (44 degrees F) for Wind River and an important ecological attribute for ESA-listed wild summer steelhead survival in the river. The assessment report states that Wind River has excessive warm water. Cold Creek joins Wind River downstream from the hatchery. This cold water stream gathers summer steelhead at its confluence, providing cooling water temperature relief for steelhead. It is likely, that Tyee Springs provided a similar thermal refuge for wild summer steelhead, but they no longer have access to it. The assessment report does not discuss Tyee Springs value as a thermal refuge for steelhead. This should be evaluated and options created to promote its use. If the hatchery degrades the cold water influence of Tyee Springs and its value as a cold

water source for Wind River steelhead, options should be developed to solve this problem. A pool at the hatchery outflow would allow steelhead to collect so that more fish could benefit from the cold waters of Tyee Springs. Angling restrictions at that point would maximize the value of Tyee springs.

Review Team Response: *Tyee Creek is an excellent cool, spring water source for the Wind River. The water also provides excellent rearing for spring Chinook salmon at Carson NFH. While the creek is no longer accessible to fluvial migration and natural rearing of juvenile steelhead in the Wind River, the creek itself still provides valuable cool water input to the Wind River.*

Steelhead Carrying Capacity:

14. The assessment report says that "Due to the current abundance of steelhead in Wind River (near carrying capacity, Dan Rawding WDFW… the presence of a hatchery steelhead program would reduce the productivity of the natural steelhead." (page 46). While I am opposed to adding hatchery steelhead to Wind River for whatever reason, this statement misrepresents the data provided in the report. On page 19 Table 1 displays the status of various salmonids, saying that historical numbers of wild summer steelhead were 2,000-5,000 fish. However, recent numbers range from 100-800 fish. It is likely that the historical steelhead abundance was greater than this table shows. For example, run reconstruction for the Stillaguamish River wild steelhead in the 1890s points out the run size was approximately 70,000 steelhead. The present run size is 500 and the management goal is 2,000. This information shows the magnitude of lost steelhead production and because the state did not embark on calculating the historic run size, it underestimated it. It is unlikely that the estimate of Wind River steelhead run size is any more accurate than that for the Stillaguamish. But if the information in Table 1 is taken at face value, the statement that the Wind River is near capacity for steelhead doesn't make sense. The point is that there is still room for the wild steelhead population to grow and it is the job of the USFWS to make sure and to verify that its operation of the Carson NFH is not impeding that recovery, including all the factors, related to the hatchery, that are likely influencing it provided in the comments above.

Review Team Response: *Based on the results to date of the USGS studies (Appendix B), we believe the direct effect of Carson NFH on the abundance of steelhead in the Wind River has been small compared to the long-term effects of Bonneville Dam, past logging and mining practices, and habitat modifications in the Columbia River estuary. Carrying capacity estimates are based on spawner-recruit relationships and the maximum mean number of returning adults that the watershed can support under current conditions, where current conditions include mortalities associated with passage through the hydrosystem and Columbia River estuary (e.g. bird predation). The adult "carrying capacity" of the Wind River would thus increase if sources of mortality in the mainstem Columbia River could be alleviated. As noted previously, the incidental harvest rates on steelhead in fisheries targeting spring Chinook need to be quantified, but we believe such incidental mortality is a harvest management problem, not a hatchery problem. In addition, perceptions regarding the past abundance of steelhead in the Wind River may have been influenced to some extent by the historical practice of releasing unmarked hatchery-origin smolts that could not be distinguished from wild steelhead as returning adults (Dan Rawding, WDFW, pers. comm.).*

Alternatives:

15. For obvious reasons relating to expanding the risk to ESA-listed summer steelhead in Wind River I am opposed to Alternatives 2, 3, 4, and 5. That leaves the preferred Alternative 1 and Alternative 6, termination of the hatchery program. To be acceptable Alternative 1 would have to include resolutions for the issues I have presented in my comments so that risk to ESA-listed summer steelhead is more fully addressed. The USFWS should also conduct a risk assessment of this hatchery program on ESA-listed summer steelhead in Wind River. Since this assessment report is primarily concerned with inside the fence hatchery operations and recommendations for improvement, it is not an adequate risk assessment for impacts to ESA-listed summer steelhead. Once that assessment is carried out and reviewed by independent scientists that have no stake in the hatchery project, a hatchery operation plan or its termination can be fully evaluated. As it stands, the assessment report is not an adequate risk assessment for ESA-listed summer steelhead and should not be treated as such. Only then can one, with confidence select either Alternative 1 or Alternative 6. Lacking such a risk assessment, my only conclusion would have to be for selection of Alternative 6, termination of the hatchery program.

    Review Team Response: *NOAA Fisheries is responsible for conducting risk assessments of the Carson NFH on ESA listed steelhead as part of the "incidental take" permitting process. A Hatchery and Genetic Management Plan (HGMP) has been provided to NOAA Fisheries as part of that permitting process. The Review Team was very cognizant – going into this review – that potential impacts of the Carson NFH on ESA-listed steelhead in the Wind River was a particularly important issue. Consequently, we specifically sought out information on those potential impacts from WDFW, USGS, and NOAA Fisheries. Despite our efforts, we found little scientific evidence that the Carson NFH is posing a significant direct risk to steelhead in the Wind River. This is not to say that the hatchery is having no effect, but those direct effects appear minor. However, the Native Fish Society has raised some interesting points related to potential indirect effects that warrant further investigation (e.g., effects of the fishway and incidental harvests targeting spring Chinook).*

Lower Columbia Fish Recovery Board[9]

Review Team note: *The Lower Columbia Fish Recovery Board did not submit any comments or recommendations at this time, but reserved the right to provide comments in the future in the context of the more cumulative review currently being conducted by the Hatchery Scientific Review Group (HSRG).*

[9] *Based on statement provided September 17, 2007 by Jeff Breckel, Executive Director, Lower Columbia Fish Recovery Board, Longview, Washington.*

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December 2007