



U.S. Fish and Wildlife Service - Pacific Region
Columbia River Basin Hatchery Review Team

Columbia River Basin - Lower Snake River Region
Grande Ronde and Imnaha River Watersheds



Oregon Lower Snake River Compensation Plan State
Operated Facilities

Irrigon, Lookingglass, and Wallowa Fish Hatcheries

Assessments and Recommendations
Final Report, Appendix C:
Comments on Draft Report and Review Team Responses

April 2011

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Appendix C: Comments on Draft Report and Review Team Responses

Appendix C presents the Team's responses to comments provided by cooperators and the general public. Only comments that required responses from the Review Team are listed in this section. Comments concurring with the Team's recommendations and those addressing information errors in the report are not shown here. Please see Appendix D for the complete text of comments provided to the Review Team.

Co-Manager Comments and Responses

Confederated Tribes of the Umatilla Indian Reservation (CTUIR)¹

CTUIR also provided informal and editorial comments to the Hatchery Review Team throughout the course of the review. The report has been edited based upon the comments received.

These are technical comments only and do not express the policy position of CTUIR as related to any of the recommendations or alternatives.

1. **Comment:** P61 – Issue LC-SC4: Last sentence; there are specific details for the use of jacks in the broodstock outlined in the Grande Ronde Spring Chinook Hatchery Management Plan (GRSCHMP).

Review Team Response: *The Team has edited the report in response to this comment, consistent with the Grande Ronde Spring Chinook Hatchery Management Plan.*

2. **Comment:** P62 – Recommendation LC-SC5: Why would you recommend precluding Catherine Creek strays from use in the Lookingglass Creek broodstock? Catherine Creek stock is the founding population source for the Lookingglass program and Catherine Creek stock captive brood progeny as well as captive adults returning to Catherine Creek are intentionally incorporated into that broodstock.

Review Team Response: *The long-term goal is to establish a locally-adapted Lookingglass Creek population that is demographically distinct from the Catherine Creek population. The Review Team has clarified the recommendation.*

¹ Written comments provided December 16, 2009 by Brian Zimmerman, O & M Project Leader, CTUIR.

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3. **Comment:** P73 – Alternative 5: The recommendation to totally replace the 1.24M production with only Lookingglass and Imnaha stocks cannot be achieved at your recommended density and flow index criteria.

Review Team Response: *The Team has corrected the description of Alternative 5 in the report.*

4. **Comment:** P95 – Issue UGR-SC3: Last sentence; there are specific details for the use of jacks in the broodstock outlined in the GRSCHMP.

Review Team Response: *The Team has edited the report in response to this comment, consistent with the Grande Ronde Spring Chinook Hatchery Management Plan.*

5. **Comment:** P98 – Alternative 2: The recommendation to reduce the program to a 130K smolt release and returning 60 pairs of adults does not even meet the minimum conservation requirement that the captive brood program was initiated from.

Review Team Response: *One intent of Alternative 2 was to maintain a minimum “effective population size” of approximately 500 individuals per generation in accordance with conservation genetic guidelines for a “closed” population. An annual broodstock size consisting of 60 males and 60 females, spawned according to current protocols, would yield an effective population size of approximately $N_e = 500$, where the mean generation time (average age at spawning) for spring Chinook is approximately 4.5 years ($4.5 \times 120 = 540$).*

6. **Comment:** P118 – Issue CC-SC4: Last sentence; there are specific details for the use of jacks in the broodstock outlined in the GRSCHMP.

Review Team Response: *The Team has edited the report in response to this comment, consistent with the Grande Ronde Spring Chinook Hatchery Management Plan. .*

7. **Comment:** P121 – Alternative 3: Why would anyone recommend transferring Catherine Creek stock (the same as is being used for the Lookingglass Creek reintroduction program) to another facility and rear an out of basin stock (Imnaha) there instead? It would seem to make a lot more sense to displace the Imnaha program to a different facility.

Review Team Response: *The Review Team believed that other facilities may be better suited for the conservation programs structurally, while Lookingglass FH would be better suited to meet mitigation needs as it was originally intended.*

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8. **Comment:** P140 – Recommendation LR-SC2: Could you clarify the first sentence for me? When you use the term viability “threshold” are you referring to the number identified for delisting or the minimum threshold? In the Lookingglass, Catherine Creek and Upper Grande Ronde sections the recommendation to re-evaluate the sliding scale is based on natural escapement goals rather than viability threshold.

***Review Team Response:** The Team is referring to the minimum abundance threshold as identified by the ICTRT and as indicated in the comanager broodstock/upstream passage management guidelines. The Team is recommending that no hatchery fish be passed upstream once a natural population achieves the minimum spawning escapement necessary to be self-sustaining, based upon the minimum viability threshold identified by the ICTRT and comanagers. The Lookingglass Creek, Catherine Creek, and Upper Grande Ronde River sections of the report have been edited accordingly.*

9. **Comment:** P141 – Issue LR-SC5: Last sentence; there are specific details for the use of jacks in the broodstock outlined in the GRSCHMP.

***Review Team Response:** The Team has edited the report in response to this comment, consistent with the Grande Ronde Spring Chinook Hatchery Management Plan.*

10. **Comment:** P143 – Recommendation LR-SC10b: This already exists although there are questions surrounding the integrity of the data.

***Review Team Response:** The Team was unaware that a pedigree analysis was being performed. The recommendation has been edited accordingly.*

11. **Comment:** P148 – Alternative 7: I don’t really understand the applicability or usefulness of this Alternative for any of these situations where multiple programs are conducted at one facility (same as Lyons Ferry Complex). You would have to discontinue all the programs at Lookingglass in order to close the facility not just one.

***Review Team Response:** The Team has clarified Alternative 7 in the report.*

12. **Comment:** P170 –Recommendation IR-SC3: See previous comment for Lostine Recommendation LR-SC2. Again, both viability threshold and escapement goals seem to be used interchangeably in the recommendation. In addition, would generally disagree that sliding scales should be based solely on minimum threshold numbers and not acknowledge seeding levels or escapement goals.

***Review Team Response:** See response to Comment 8.*

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- 13. Comment:** P171 –Recommendation IR-SC4: In many cases you make the recommendation to increase harvest opportunity without any consideration of the feasibility to do so. In most places within the Snake Basin, there would need to be a change in NMFS “take” criteria to expand opportunity.

Review Team Response: *In IR-SC4, The Team recommended that numeric goals be established for harvest that account for the constraints imposed by incidental take criteria and the resulting harvest effort, and the consideration of other options/benefits for handling surplus hatchery-origin spring Chinook returning to the Imnaha River. In addition to increasing harvest opportunity, the Team also listed increasing the number of Chinook provided to food banks, direct distribution of adult fish to the tribes, or reducing the size of the program. The feasibility and desirability of each option will need to be evaluated.*

- 14. Comment:** P172 –Recommendation IR-SC6: Your recommendation to incorporate two stage releases conflicts directly with your recommendation not to do this for all the other Grande Ronde programs.

Review Team Response: *The Team has removed two-stage releases as an option in recommendation IR-SC6.*

- 15. Comment:** P177 – Alternative 4: To reiterate the concerns expressed in the LFH Complex Report, “Stepping Stone” programs significantly affect both logistics and space at a hatchery facility. While you acknowledge the logistical complexities as a “Con” there is no mention that these types of programs essentially double the holding needs for both broodstock and juveniles compounding already existing space issues.

Review Team Response: *Alternative 4 does not recommend an increase in program size. The overall release objective remains 360,000 but with 120,000 for an integrated component and 240,000 for a harvest component. The two components are divided to maximize the rearing space at Lookingglass FH currently dedicated to the Imnaha program (six raceways) and are sized to stay within the Team’s recommended rearing densities (65k max per raceway). As indicated in the cons section, the Team does agree that a significant investment would be required to modify the broodstock collection and holding facilities at the Imnaha Satellite Facility and Lookingglass FH.*

- 16. Comment:** P179 – Alternative 6: Question the recommendation to reduce to 120K smolt level. It is my understanding that a 150K program was needed at a minimum to maintain conservation benefits. This was the criteria used when developing the captive brood programs.

Review Team Response: *Aside from Alternative 1, the Team’s alternatives largely represent concepts intended to cover a range of options related to meeting harvest, conservation, and*

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mitigation goals. Ultimately, the specific number of smolts released under any alternative would be determined by comanagers. In this case, per the footnote where Alternative 6 is outlined, the 120,000 smolt release is consistent with the HSRG's recommendation of 115,000 smolts but takes into account the capacity of individual raceways at Lookingglass FH at the Team's recommended rearing densities (maximum of 65,000 smolts per raceway).

- 17. Comment:** P199 – Issues WW-SS3&4: I think it would be beneficial to relate these two issues to the same issues and recommendations in the LFH Complex Report rather than segregating or isolating them from each other.

***Review Team Response:** The Team concluded, consistent with the conclusions of comanagers, that the straying of Wallowa hatchery stock steelhead into the Deschutes and John Day rivers is a greater risk than straying of those fish within the Grande Ronde River basin. Hence, the Team did not want to confound those two issues or their recommendations. Those issues and recommendations were developed to be consistent with those for the Cottonwood Creek (Wallowa Stock) Hatchery Steelhead program in the Washington LSRCP report.*

- 18. Comment:** P201 –Recommendation WW-SS6: The statement regarding reducing the number of smolts reared “on-station” needs to be clarified since early rearing for these fish occurs at Irrigon.

***Review Team Response:** The report has been edited accordingly.*

- 19. Comment:** P201 –Recommendation WW-SS7: How big an issue is the CWD problem? It appears that they fall within the IHOT guidelines as meeting full production most all the time. Is the implementation of these recommendations justified considering their potential financial and production impacts?

***Review Team Response:** Cold water disease is considered a significant problem by ODFW personnel.*

- 20. Comment:** P223 –Recommendation LSC-SS4 and 5: The benefits from some of these recommendations to increase survival are a bit misleading. While they may lead to small reductions in O&M costs due to less brood, eggs, water, etc., they could also lead to increased space issues or costs by requiring more trays as well as larger adult surpluses due to less brood. Again, I think it would be beneficial to assess the potential benefit against the potential cost in making the recommendation to see if the increase in adult survival justifies the implementation effects especially for mitigation type programs. Also, the statement “maximum of two females per tray or ~8000 eggs” doesn’t seem to jive. Most steelhead programs have much higher fecundities than 4000/female. Why not just leave it as the IHOT guideline?

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Review Team Response: *Although the Team did indicate where significant infrastructural needs or costs may occur to implement certain recommendations, the cost itself was not used to determine whether a recommendation was appropriate. Rather, the benefits and risks were weighed from a biological perspective. The Team did remove the “~8,000 egg/tray” component of Recommendation LS-SS4 as suggested by this comment.*

- 21. Comment:** P226 – Alternative 1: General comment; in many case the “current program” cannot be implemented with the recommendations.

Review Team Response: *Alternative 1 is to implement the current program “with” the Team’s recommendations.*

- 22. Comment:** P229 – Alternative 4: Same comment as for Imnaha CHS.

Review Team Response: *See response to comment 15.*

- 23. Comment:** P230 – There does not appear to be any Alternative which specifically addresses discontinuation of the Big Sheep Creek juvenile program.

Review Team Response: *See recommendation LSC-SS2 for the current program.*

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Oregon Department of Fish and Wildlife²

ODFW provided informal and editorial comments to the Hatchery Review Team throughout the course of the review. The report has been edited based upon the comments received. The comments listed below are those that the Team believed required responses.

General Comments:

- 1. Comment:** HRT recommended that Density Index (DI) should not exceed 0.2. ODFW is in general agreement with low density rearing, however, DI is applied to final rearing. ODFW, Nez Perce Tribe and Confederated Tribes of the Umatilla Indian Reservation have agreed that a higher density (0.75 DI or 1 pound of fish per ft³ rearing volume) during early rearing is acceptable. ODFW, evaluations on rearing density (DI) between 0.1 and 0.25 (Rapid River stock, brood years 1991 and 1992) at Lookingglass Hatchery were inconclusive (ODFW data files; personal communication Hoffnagle 2009). Low density (0.1) rearing did not increase smolt-to-adult survival (SARs) for Chinook that returned to Lookingglass hatchery. In contrast, smolts reared at a density index of 0.25 performed equally as well. A final rearing density of 0.2 is not unreasonable, but supported more by an "artful" approach to fish culture rather than a scientific one. Although not recommended by the HRT, ODFW would strongly support low density rearing for the "stepping stone" group (0.15) but a higher density (0.25) for the harvest group.

Review Team Response: *The Team's "best management practice" recommendation to reduce early rearing densities to DI=0.2 is primarily to address existing and potential on-station fish health issues. The Team recommends DI=0.2 until further evaluation identifies more specific and optimum density and flow indices. On station survival, as well as SARS should be assessed when determining an optimal rearing density. See the report titled "A Report of Infectious Disease Epidemiology among Spring Chinook Salmon at Lookingglass Hatchery" (Groberg, W.J, Onjukka, S.T., Brown, K.A. and Holt, R.A., November 30, 1999).*

- 2. Comment:** HRT recommendation of static Flow Index (FI) of 1.0 does not apply to water sources of daily and seasonally fluctuating water temperatures. The FI is a measure of available oxygen at various water temperatures and elevations; therefore, a static measure is not applicable (Piper 1982). US Fish and Wildlife Service salmonid hatcheries are operated with FI between 1.0 and 2.5 (Wedemeyer 2001).

Review Team Response: *The Team agrees that there is some flexibility in maximum flow index given differences in elevation and water temperatures among hatchery facilities. The Team recommends this as a "best management practice" with a maximum flow index of FI=1.0 "or" a flow index that results in effluent oxygen levels at no less than 6 ppm or no less than 80% of oxygen saturation.*

² Written comments provided January 7, 2010 by Scott Patterson, ODFW Hatchery Coordinator for Northeast Oregon. Fish Health comments provided January 6, 2010 by Sam Onjukka, ODFW Fish Health Specialist for Northeast Oregon.

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3. **Comment:** HRT recommended that fish are not moved between basins and hatcheries due to concern of disease transmission. ODFW believes that this risk can be minimized with good fish health and culture practices. Therefore, the benefits of rearing fish in secure locations in quality water outweigh the potential fish health risks...

***Review Team Response:** The Team's recommendations reflect best management practices for fish culture, including maintaining the biological parameters of the cultured stock to the greatest extent possible. Transferring fish between basins poses fish health risks not only to the fish transferred but the fish reared on-station at the recipient facility and to the fish and wildlife downstream of the recipient facility. If out-of-basin transfers are proposed, all the risks of doing so should be weighed against the benefits. Factors such as disease resistance, etc. could also be compromised if fish are reared out of basin.*

4. **Comment:** HRT recommendation for a two stage brood or “stepping stone” approach in some programs or alternatives but not in others is confusing.

***Review Team Response:** For some programs in which conservation and harvest are goals of equal priority, a two-stage stepping stone program may provide an avenue for meeting both these goals while reducing risks.*

Comments from Fish Health

5. **Comment:** LC-SC6: Adult Chinook passed above Lookingglass Hatchery (LGH) are also a known carrier of fish pathogens and contribute to the risk of rearing fish on surface water at this facility (~May-release the following year) for each brood year.

***Review Team Response:** This situation has been clarified in the report.*

6. **Comment:** LC-SC7: ... discusses the possibility of moving fish outside earlier on surface water if fish health is not a concern. There are fish health concerns (pathogen exposure) with doing this. ODFW Fish Health recommendations have been maximize rearing on pathogen free water.

***Review Team Response:** The Team has edited the report based upon this comment.*

7. **Comment:** LC-SC10: These are therapeutic treatments of Erythromycin. The reason for these treatments is that adult salmon carrying the agent for BKD are passed above the hatchery water intake and thus contaminate the water supply. Outbreaks of this pathogen occur at the hatchery and thus therapeutic treatments are recommended before clinical disease occurs. Attempts to eliminate the use of erythromycin at Willamette River spring Chinook facilities

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has worked well where no anadromous fish (specifically salmon species) are present in the hatchery's water supply. At facilities where salmon are present, we have not been able to eliminate the use of erythromycin due to continual presence of clinical disease even in fish from females where the pathogen was not detectable by the ELISA method.

Review Team Response: Issue LC-SC10 has been modified to reflect the concerns mentioned in the comment above.

8. **Comment:** LC-SC11: *M. cerebralis* (this pathogen is not a concern at Irrigon FH since there is no fish to fish transmission – a well water facility).

Review Team Response: Fish that are transferred from Lookingglass Hatchery are potential carriers of *M. cerebralis*, and bird predation at Irrigon FH could spread the pathogen among raceways and to fish populations outside of the hatchery.

9. **Comment:** LSC-SS7: The introduction incorrectly states that no pre-release examination is done at Little Sheep [Creek]. In addition to a pre-transfer examination at Irrigon Hatchery, we do conduct pre-release examinations as per a monthly examination if smolts are acclimated more than three weeks.

Review Team Response: The introduction has been corrected and the recommendation modified.

10. **Comment:** ODFW Fish Health does not support or think it is necessary to lethally sample 60 grab-sampled healthy fish sample for *M. cerebralis* and virus. We do support the recommendation that any non-migrating steelhead smolts be placed only in lakes and ponds where *M. cerebralis* is endemic in the system.

Review Team Response: The Team has corrected the report based on this comment.

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Stakeholder Comments and Responses

Native Fish Society³

General

1. **Comment:** In reviewing the information in the hatchery team review for Grande Ronde spring chinook I looked for but did not find a complete history of this hatchery spring chinook program. By this I mean that the initial program used out-of-basin spring chinook for hatchery production (pre-1991). After spring chinook were listed as a threatened species under the ESA, the whole hatchery program was changed from using non-native spring chinook (Carson and Rapid River stock) to using endemic stock based on genetic analysis of the Grande Ronde stock that indicated six distinct breeding populations in that basin. This shift in the hatchery program is totally missing in the introduction to spring chinook hatchery reform, yet it is a major commitment to recovery and conservation of that stock of fish. Can you please explain why this history does not get the discussion it deserves in the present hatchery reform draft?

Review Team Response: *The Team has edited the report based upon this comment. The management history within the Grande Ronde River Basin was also identified in the briefing document and in the multiple supporting documents used by the Team for conducting the review.*

2. **Comment:** Furthermore, I have noticed that for summer steelhead hatchery programs in the Grande Ronde basin there is no commitment to eliminating the non-native hatchery summer steelhead stock and retooling the hatcheries with native summer steelhead as was done for spring chinook. This difference in the treatment of spring chinook and summer steelhead hatchery programs requires an explanation in a plan that addresses hatchery reform. Can you explain why the hatchery review team ignored this primary issue in its recommendation for hatchery summer steelhead reform?

Review Team Response: *The Team's review of the existing steelhead programs in the Grande Ronde River Basin was based on our understanding of co-managers' goals and objectives for the current programs. Biological and harvest differences between steelhead and Chinook salmon yields different levels of risks and benefits for similar actions. The current co-management agreement in the Grande Ronde River Basin does not identify the need for use of endemic steelhead for conservation and recovery purposes. The current non-endemic steelhead program is identified as a segregated program that is intended to be operated consistent with ESA and regional steelhead conservation and recovery goals and objectives. The Team identified issues with the current Grande Ronde River steelhead program that we felt were inconsistent with operation of a segregated program and provided alternatives and recommendations to meet stated management goals and objectives. Alternative 3 "Terminate the Wallowa steelhead program at Wallowa FH and Big Canyon and develop a program based upon an endemic broodstock from the Grande Ronde River" was debated but the review*

³ Written comments provided December 22nd, 2009 by Bill Bakke, Director, Native Fish Society.

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team concluded that the current program with recommendations would maintain current harvest benefits while reducing risks. The Team was particularly concerned about the risks of collecting wild broodstock in areas that are currently managed for wild fish only.

3. **Comment:** There is an absence of consistency between the treatment of spring chinook and summer steelhead in the Grande Ronde River and the review team should explain the departure between the treatments of these two species in the same basin.

Review Team Response: *The Team's alternatives and recommendations were intended to be consistent with treatment of listed populations of salmon and steelhead within the Grande Ronde River Basin. Properly functioning hatchery programs should be consistent with stated management goals and objectives. If the primary management goal of the hatchery program is for conservation and recovery of listed populations, they should be integrated and operated consistent with well defined conservation and recovery goals and objectives. If the primary management goal of the hatchery program is for harvest, using a non-endemic source, then it should be operated as a properly segregated program consistent with well defined conservation and recovery goals and objectives. (See also response to Comment 2).*

Little Sheep Creek Summer Steelhead

4. **Comment:** LSC-SS1 P. 222: A) No cost to catch evaluation recommended. B) Does the LSRCP have a harvest and recreation benefit goal? Mitigation is constructed to produce fish not worry about contribution and conservation. It is an industrial model concerned only with production rather than providing a stream of benefits for user groups or protecting native fish sustainability.

Review Team Response: *A) 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 comanagers in the implementation phase.*

B) The Team's recommendation for Issue LSC-SS1 - to restate and quantify program goals in terms of the specific benefits the program is intended to provide - was intended to be consistent with the concerns expressed in the comment above. "Mitigation" provides the potential opportunity for benefits to be achieved but may not explicitly state goals in terms of measurable benefits to people or the ecosystem. The Team believes that "goals" should be quantified, where possible and expressed in terms of values and benefits to the community (harvest, conservation, education, research, employment, recreation, etc.).

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5. **Comment:** LSC-SS2 p. 222: No genetic benefit mentioned for issue. I agree with this assessment pointing out that politics rather than conservation and recovery as the primary driver for Big Sheep Creek.

LSRCP was set up as a mitigation plan based on an industrial production model. It is concerned about production quotas and return. A major departure from the industrial model is the evaluation of return on the investment. The LSRCP is not concerned with contribution to fisheries or with conservation of wild, native fish populations. If it were, the initial spring chinook mitigation program would have been designed to maintain the productivity of the Grand Ronde salmon. Instead, the primary program focus was using non-native hatchery stock to meet production goals. It was not until the Grand Ronde spring chinook were listed as a threatened species under the ESA that attention was paid to conservation of the genetic diversity in the basin and using locally adapted fish for the hatchery program. The same approach was taken for steelhead with hatchery stock taken from Lower Granite Dam fishways rather than from the rivers of origin. Accountability for the use of public funds would determine the actual contribution to the public fisheries and the cost to provide a fish that is harvested.

Review Team Response: *The Team's recommendation to this issue, discontinue the release of smolts and adults into Big Sheep Creek unless based upon specific goals developed in terms of measurable benefits and weighed against the risks imposed to natural steelhead populations, was intended to be consistent with the comments above. If specific goals are not identified and benefits cannot be measured against risks, then the Team's recommendation is to discontinue the action.*

6. **Comment:** Broodstock choice and collection: This section is blank. A description of this problem, if any, should be stated and it should be noted whether the reviewers agree or have recommended changes. This would be better than leaving it blank.

Review Team Response: *The Team did not identify any issue with existing broodstock choice (Imnaha steelhead) and collection (none identified) and thus did not have any recommendations.*

7. **Comment:** LSC-SS3 - It is noted that more hatchery origin fish than wild origin fish are naturally spawning in Little Sheep Creek, but this is excused because there is a study evaluating the reproductive success of hatchery and natural-origin fish. This study has been going on for years and there is presently enough information on this question generated since 1978 on the Deschutes, Kalama and Hood River to conclude that the reproductive success of wild steelhead is negatively affected by hatchery origin fish. Consequently, using research as a way to justify continuing to damage the fitness and reproductive success of wild (ESA-listed) steelhead is no longer acceptable. In addition, the excessive number of hatchery-origin steelhead in the natural spawning population is in violation of the ODFW wild fish policy and the Native Fish Conservation policy. Both these policies are administrative law and therefore this program is illegal. The weir on this stream should be used to exclude hatchery fish from

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the natural production area above it and adult hatchery steelhead should not be outplanted into the stream above this weir.

The recommendation to equalize the hatchery and wild spawner numbers above the weir on Little Sheep Creek using the HSRG protocol is inappropriate for it increases the risk to an ESA-listed wild steelhead population. The native brood stock integrated hatchery technology is a hypothesis that has not been tested (RIST 2009) and should not be used on a threatened population. By definition a threatened wild population is not abundant enough to be mined for eggs in the hatchery program and allowing interbreeding between hatchery and wild fish is also inappropriate since we know that it has a negative effect on the wild population. In addition, we know there are negative ecological effects created by naturally rearing hatchery-origin fish. Consequently, the recommendation in this section is biologically incompetent, it ignores the best scientific information already available, and contributes to the decline rather than to the recovery of a ESA-listed steelhead population. So quit it!

Review Team Response: *The Team's issue and recommendation was based on the stated goal of an experimental study to assess the relative reproductive success of hatchery and natural-origin steelhead passed upstream of the weir in Little Sheep Creek. The recommendation was intended to be consistent with the stated research and conservation goals identified for the program. The Team's review was not intended to assess research results from the three studies identified above and apply them to other steelhead populations within the Columbia River Basin. Because of the physical location of Little Sheep Creek upstream of eight dams within the Columbia River Basin relative to the locations of the other populations of steelhead where similar studies have been conducted, the Team cannot exclude the possibility that the demographic benefits of hatchery supplementation in Little Sheep Creek exceed the genetic or ecological risks. The Teams recommendation was to adjust the protocols of the experimental design to (a) increase the scientific merits of the study portion of the program and (b) reduce the risks of hatchery-origin fish spawning naturally upstream of the weir in Little Sheep Creek.*

8. **Comment:** LSC-SS11 - While the Native Fish Society agrees with the research and monitoring recommended in this review, we find it totally irresponsible to not include a cost to catch evaluation of this hatchery program. This means that appropriate data is collected on the cost to produce these hatchery fish and an accurate catch assessment of these hatchery fish is conducted. These programs are supported by public funds and it goes to accountability to have an accurate assessment of the cost to produce a fish that is harvested from this hatchery program. The reviewers should be supporting accountability of these publicly funded hatchery programs by recommending a cost to catch analysis for each hatchery program.

Review Team Response: *As noted previously, the Team evaluated the benefits and risks of the programs relative to their goals from a scientific perspective and did not attempt to perform an economic evaluation. The Team believes that public accountability is achieved, from a scientific perspective, by (1) quantifying program goals in terms of the specific benefits the program and actions are intended to provide, and (2) by developing a monitoring and evaluation plan to measure and evaluate both the realized benefits and the risks of the program..*

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9. **Comment:** Recommended Alternative - Given the legitimate concerns about the shortfall in the present evaluation, the Native Fish Society does not agree with the recommendation. We believe that based on the issues identified in our review, that ESA-listed wild steelhead are not adequately protected and this recommendation impedes recovery of these steelhead rather than advances it.

Review Team Response: *The Team's recommended alternative is contingent on implementation of all program-specific recommendations, and if implemented, this alternative should maintain the genetic integrity of the broodstock, improve fish culture efficiency, decrease ecological and disease risks, and maintain the existing level of fishing opportunity for steelhead in the Imnaha River and in downriver fisheries. This includes defining goals in terms of numeric outcomes that quantify intended benefits or goals which are consistent with mitigation goals. The Team would concur with your stated concerns if implementation of all program-specific recommendations were not initiated.*

Wallowa Hatchery Summer Steelhead

10. **Comment:** Since the Wallowa hatchery steelhead is certified a non-native stock and for that reason it is not listed under the ESA, what is the scientific basis and defense for retaining this stock in production? In order to establish an effective wild steelhead recovery program for the Grande Ronde River and to reduce straying into other watersheds, this hatchery stock should be terminated. What is the scientific basis for retaining this hatchery stock given its detrimental impact on ESA-listed steelhead and recovery investments in this basin?

Review Team Response: *The Team's review of the Wallowa steelhead program in the Grande Ronde River Basin was based on our understanding of the co-managers goals and objectives for the current program. The program was defined as a segregated program intended to provide for harvest consistent with conservation and recovery goals and objectives within the Grande Ronde River and the Columbia River basins. The Review Team concluded that this program is making very significant contributions to harvest and fisheries in the Grande Ronde River. Any change to the existing program has to consider the effects of those changes on these latter benefits.*

In reviewing the Wallowa steelhead program, team members had concern related to the affects this program may have where these fish stray into natural spawning areas in the Deschutes and John Day rivers. Information provided by ODFW staff indicates the concern for straying within the Grande Ronde basin is not as great, however, the team recommends ODFW continue monitoring the natural escapement to tributaries in the lower Grande Ronde, particularly in Joseph Creek and the Wenaha River, to ensure that less than 5% of the naturally spawning population are hatchery-origin Wallowa stock.

The Team concluded that continuation of the current program was a risk unless all recommendations were implemented and assessed, including; 1) Continue to investigate the use of fall-returning adults versus production adults. Although limited data suggests there is no difference in stray rate for the fall-returning program they contribute to fisheries in the

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Grande Ronde for a longer time period than the production fish. 2) Investigate other broodstock sources as alternatives to the current Wallowa stock. 3) Improve marking techniques of hatchery fish to ensure no hatchery-origin adults are released (adult recycle program) to spawn with natural-origin fish below Wallowa FH. In addition, discontinue the recycling of Wallowa stock adults returning to Big Canyon. The Team concluded that the risks of this practice outweigh the benefits. 4) Investigate facility modifications at the Wallowa FH, Irrigon FH, and at the Big Canyon acclimation site to improve rearing conditions and other operational constraints.

As stated above, the current co-management agreement in the Grande Ronde River Basin does not identify the need for use of endemic steelhead for conservation and recovery purposes. The current Wallowa steelhead program is identified as a segregated program that is intended to be operated consistent with ESA and regional steelhead conservation and recovery goals and objectives. The Team identified issues with the current Wallowa steelhead program that we felt were inconsistent with operation of a segregated program and provided alternatives and recommendations to meet stated management goals and objectives.

- 11. Comment:** Genetic evaluation of steelhead indicate that 70% (of the unmarked steelhead captured at Wallowa FH) are of hatchery parentage, so it is unclear what proportion of wild-origin fish were collected. More information needs to be provided on the goals of this program. We know the hatchery fish have a high stray rate and if this program is targeting hatchery-origin fish, then how does this new broodstock reduce the stray rate? P. 185

***Review Team Response:** The Team's recommendation is to continue the downstream release of unmarked adult steelhead that enter the trap at Wallowa FH. The absolute numbers are relatively low, and the Team had to weigh the risks of removing "wild" steelhead from the Wallowa River (30% of the fish) versus the release of hatchery-origin adult steelhead (70% of the fish) back into the Wallowa River. The Team recommended the return of all unmarked fish back to the river coupled with improved marking of hatchery-origin smolts prior to release.*

- 12. Comment:** Adult hatchery steelhead are infected with whirling disease found in Wallowa R. and Spring creek that feeds the hatchery. On p. 185, you state, "Adult steelhead return with non-debilitating infections of *M. cerebralis* (agent of whirling disease), likely obtained as smolts when exposed to the parasite-endemic waters of the Wallowa River and Spring Creek."

Stray steelhead infected with whirling disease have been recovered in the Deschutes River and it can be assumed infected fish are in the John Day River. Ecological conditions in the Deschutes River do not favor the establishment of whirling disease (exception may be Trout Creek), but there has been no assessment of whirling disease in the John Day River. There is a potential threat of whirling disease becoming established in the John Day River. Stray hatchery fish from Wallowa and Big Canyon facilities are carriers of whirling disease, so their threat to wild steelhead in basins where they stray is three fold: genetic, ecological, and disease transmission.)

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Review Team Response: *Correct. See recommendation WW-SS3, which includes modifying or eliminating transfers so that juvenile steelhead are reared within the appropriate basin for a greater portion of their life. Currently, the hatchery steelhead are not exposed to the whirling disease parasite (*M. cerebralis*) until acclimation in the Wallowa/Grande Ronde watershed and/or upon release and migration to/from the ocean. Because *M. cerebralis* is present in the Wallowa/Grande Ronde systems, both the wild and hatchery steelhead adults are potential vectors of these diseases. However, unlike the wild steelhead juveniles, the hatchery-reared steelhead are not exposed to *M. cerebralis* during early rearing because the eggs are transferred to Irrigon Hatchery and reared on pathogen-free well water. Thus, the hatchery-reared steelhead are at less risk from infection than the wild fry that are likely exposed to and susceptible to *M. cerebralis* in the watershed. The Team provided several recommendations that could potentially reduce out-of-basin stray rates. However, the actual cause of straying has not been identified; moreover, the stray rates of natural-origin adult steelhead from the Grande Ronde River are unknown. If the wild steelhead adults from the Wallowa/Grande Ronde systems stray, these too are potential vectors of disease in other basins.*

- 13. Comment:** According to the review team draft report 920,000 steelhead smolts are released annually from Wallowa and Big Canyon facilities into the Grande Ronde system. The estimated stray rate for these fish is 6%. The report should estimate the number of Wallowa Hatchery strays. These strays not only reduce the mitigation benefit of this hatchery program to the fishery in the Snake River basin, they represent a major impact on wild steelhead in the basins where they stray. The review team did not finish their evaluation for a calculation of the estimated number of strays produced by the hatchery program was not done. Considering the high risk these fish represent to wild steelhead in other basins, it is appropriate to estimate the number of fish straying each year by basin.

Stray rates into other watersheds such as the Deschutes and John Day rivers is a genetic and ecological risk to wild ESA-listed steelhead in these basins. The stray rate averaged 586 fish from 1993 through 2005 with a range of strays of 143 to 1,365. Strays not only endanger wild steelhead they are not available to fisheries they are intended to mitigate. In addition, the cost of production for these fish is increased because the intended benefit of the hatchery program is reduced.

Review Team Response: *The Team acknowledged the problems outlined in this comment and provided several recommendations and potential alternatives for the current program to reduce those risks. The actual alternative implemented would need to be a comanager decision in response to stakeholder and comanager needs. See also response to Comment 10.*

- 14. Comment:** Steelhead are not passed above the weir on Spring Creek to help prevent the spread of disease to the fish reared at Wallowa FH. This hatchery program has removed a stream from natural production and is a limitation on recovery of ESA-listed wild steelhead in the Grande Ronde River. The review team should calculate the potential production and the impact on recovery that has been imposed by taking this stream out of the natural spawning capacity for wild steelhead.

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Review Team Response: *Spring Creek is located within a highly developed agricultural area and has limited steelhead potential for recovery purposes.*

- 15. Comment:** From p. 186 of the report, “Deer Creek is the location of the Big Canyon acclimation facility. All unmarked adult steelhead are passed above this weir and no hatchery fish are passed. Since Wallowa Hatchery steelhead were passed above this weir in the early years of operation, genetic sampling indicate that the natural-origin fish in Deer Creek have been influenced by Wallowa Hatchery stock.” This protocol is ineffective as a wild ESA-listed recovery measure because of the introgression of non-native non-DPS steelhead in the naturally produced steelhead population. This population is an example of a hatchery swarm that scientists have warned about in the use of non-native hatchery fish in a basin. Genetic sampling of all unmarked hatchery fish from natural production is needed so that only the estimated 30% of the run that is actually of native ancestry is passed above this weir.

Review Team Response: *The Team did not make a specific recommendation to genetically sample all unmarked steelhead returning to the Big Canyon facility to facilitate release of only steelhead of native ancestry. Samples could be collected to monitor the number of hatchery-origin fish released and used to assess impacts to a recovery strategy when developed. The implicit assumption is that all unmarked natural-origin fish trapped at the Big Canyon facility could have some Wallowa hatchery stock ancestry.*

- 16. Comment:** Recycling of hatchery fish returning to the Big Canyon facility to augment fisheries should be terminated. This action does not contribute much to the fishery it is intended to benefit; it increases stray rates, and increases genetic and ecological impacts on ESA-listed steelhead.)

Review Team Response: *The Team’s recommendation (WW-SS6) concurs with the above comment.*

- 17. Comment:** In the 1980s the NMFS research pointed out that steelhead strays were a benefit to the lower Columbia River fishery, but did not consider their negative biological impact on native wild steelhead. Following this research, NMFS stated that the hatchery strays in the Columbia were not caused by smolt transportation. The goal of NMFS is to protect the federal hydro system from spilling water for smolt migration at the dams and in doing so they advocated the benefits of smolt transportation passed these dams. In 2008 and 2009, additional research once again documents the high stray rates of Snake River steelhead, saying “downstream barging of juveniles may result in stray rates 2 to 3 times greater than those juveniles that were not barged.” P. 186.

Review Team Response: *See response to Comment 10 above. The Team also supports the continuation of the multi-agency Comparative Survival Study to assess the effect of barging on survival. While the Team did not review the hydrosystem transportation operations, it did identify straying of Wallowa stock steelhead as a risk to populations outside the Grande*

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Ronde River basin (e.g. Deschutes and John Day rivers.) The Team also recommended the continuation of research to assess straying of Wallowa stock steelhead. The Team also provided recommendations for potential actions that may reduce straying consistent with criteria for operation of a segregated hatchery program and conservation objectives of listed populations within the Columbia River Basin.

- 18. Comment:** While having a kill fishery on ad-clipped residualized steelhead has limited value in reducing the residual rate of these hatchery smolts, there is no mention that this fishery has been evaluated for its effectiveness in removing residuals. In addition, a trout fishery increases the mortality on wild, ESA-listed steelhead juveniles that are caught and released. If barbed hooks and bait are allowed in this fishery, the impact on wild steelhead juveniles and on adult returns is increased. The review team did not address the need to evaluate this program even though it was established to clean up residualized hatchery-origin smolts.

Review Team Response: *The Team did not make a recommendation on harvest actions taken by ODFW to reduce residualism of hatchery steelhead because it was out of the Team's per view to review harvest management. We did, however, recommend continued monitoring and evaluation of steelhead residualism and to implement actions consistent with further reductions in residualism rates.*

- 19. Comment:** Page 188 of the report states, "There is no culling for IHNV because prevalence of the virus is very low (from 2000 to 2009, prevalence averaged 1.5%, with a range of 0 to 7.8%). The progeny of IHN adults are utilized." Since these fish have a high stray rate into other watersheds, they are potential vectors for spreading this virus throughout the Columbia River basin. The review team did not discuss this issue. In addition, these fish are infected with whirling disease and strays may introduce this disease into other basins that these fish stray into.

Review Team Response: *Eggs from all females, including the IHNV-positive adults, are water-hardened in iodophor, which effectively kills external pathogens on the eggs and essentially eliminates vertical transmission and infection. The eggs are then transferred to Irrigon Hatchery, disinfected with iodophor again, and reared on IHNV-free well water. Thus, the hatchery-reared steelhead are actually at less risk from infection than the wild fry. Also, see response to Comment 12.*

- 20. Comment:** Eroded dorsal fins could be used as a passive mark for these hatchery fish and regulations adjusted to permit a kill fishery on fish with eroded dorsal fins in rivers where they stray. This would be an important adjustment in angling regulations when hatchery fish are not externally marked.

Review Team Response: *See response to Comment 18, above.*

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- 21. Comment:** Size at release, if larger than naturally-produced smolts, increases competition between hatchery and wild smolts. Scientific recommendations have provided long-standing advice for release of steelhead smolts at the same size as the wild smolts in the stream. The review team does not address these issues as an important factor in reducing the impact of hatchery steelhead on wild steelhead. In addition, there is a major residualization of hatchery smolts in the river. These fish compete for food and rearing space with wild steelhead. The review team does not address the ways in which this can be controlled at the hatchery. For example, large male smolts may residualize at a greater rate than female smolts, but the review team does not make recommendations to solve this problem, but does note that ODFW has made modifications to reduce residualization. Reducing the impact of residual hatchery steelhead on ESA-listed wild steelhead may be an important contribution to recovery of the wild stock. A residualization target should be set and verified.

***Review Team Response:** Size at release of hatchery steelhead is consistent with NOAA criteria to reduce residualism and competition with natural Chinook. The Team also recognizes that additional research is needed on understanding ecological interactions between hatchery and wild fish to better define best management practices. Results of an ODFW study of residual hatchery steelhead in the Grande Ronde and Imnaha river (1993-1995) showed that the highest densities of residual steelhead were generally found near the release sites (Little Sheep Creek and Deer Creek) and likely minimizes the probability of interacting with naturally produced fish. Based on the distribution of residuals that were observed and the results of stomach samples of residuals collected, it appears that predation on juvenile salmonids is not likely to be a significant problem in northeast Oregon. As a result of the study, ODFW has established index sites to assess long-term trends in the extent of residualism. ODFW has also developed, and evaluates, hatchery release strategies - specifically volitional releases - that may minimize the rate of residualism.*

- 22. Comment:** Page 191 of the report states, “Near the end of the release period for the second group, before the remaining fish are force released, as a best management practice, the remaining steelhead are sampled and removed if greater than 70% of the fish are males. When greater than 70% of the fish are males, this results in about 1,000 fish being removed instead of released. This is one approach applied in steelhead programs in attempt to reduce the number of steelhead released that have a high likelihood of residualism”. While this is an important protocol to control residualized smolts, it does not address the central problem of hatchery generated residuals in the stream. The Review Team does not address this overall problem.

***Review Team Response:** The Team recognizes that hatchery residuals are a risk to naturally produced fish and recommended WW-SS20 to reduce that risk. See response to Comment 21 above.*

- 23. Comment:** A total of 920,000 smolts are released annually from the Wallowa hatchery steelhead program. Is this large release compatible with recovery of wild, ESA-listed steelhead given the stray rates identified, smolt residualization, and potential competition for

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food and space with wild steelhead in the stream? In addition, large, timed releases of smolts can attract predators that can have an impact on wild smolts. Mullen identified the pied-piper effect on the Wenatchee River when large blocks of smolts dislocated wild smolts and made them more vulnerable to predation. The review team does not address the effect of this large smolt release on wild ESA-listed steelhead and spring chinook in the Grande Ronde basin. Also, there are impacts from these massive releases in the Snake River that also places wild smolts at considerable risk. The cumulative impact of large smolt releases in the Grande Ronde basin and in the Snake and Columbia Rivers are not addressed by the review team. The review team needs to evaluate cumulative effects of hatchery production beyond the river of origin.

Review Team Response: See responses to Comments 10, 17, 18, 21 and 22 above.

- 24. Comment:** While the harvest benefits are estimated for within and outside the project area, the review team does not estimate the cost to provide this catch in these areas, so the public is provided with no information about how much it costs in public funds to provide a fish that is taken in the various fisheries. By not documenting the cost to catch for this hatchery program, the review team is not informing the public about the use of public funds and this lack of transparency is unacceptable in a review of any hatchery program supported with public dollars. P. 196.

Review Team Response: As noted previously, the Team did not perform an economic evaluation of hatcheries but evaluated the programs from a scientific perspective with respect to their goals, realized benefits, and risks. The Team's comments above regarding recommendation to restate and quantify program goals in terms of desired benefits was intended to be consistent with this comment. These goals should be quantified, where possible and expressed in terms of values and benefits to the community (harvest, conservation, education, research, employment, recreation, etc.).

- 25. Comment:** The Team recommends that, "Present program goals for Wallowa stock steelhead are not fully expressed in terms of numeric outcomes that quantify intended benefits or goals" (WW-SS1). While we agree that this problem be resolved, the Native Fish Society also recommends that the cost accounting for this program, using public funding, be transparent. This means that the cost to provide a fish that is harvested must be determined. By doing this the economic cost of the program is displayed. In an earlier conversation with the manager of the LSRCP hatchery program, I brought this issue up and was told directly by the manager that this information was not needed. This attitude regarding cost evaluation means that the program managers are opposed to cost accounting and providing the public with information regarding their investment in mitigation.

Review Team Response: See response to Comment 24.

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- 26.** The Native Fish Society disagrees with recommendation WW-SS2. Obviously, genetic monitoring of these fish has allowed a distinction to be made between progeny of hatchery-origin fish and native, wild fish. This is a legacy of the old hatchery practices (it created a hatchery swarm) that was not concerned for the impact on wild fish. (Ed Crateau, LSRCP, said “Preservation of wild populations was not a high priority at the time.”) This recommendation is consistent with what Crateau said about the early LSRCP hatchery program that he called “a mistake.” To continue that practice, especially for an ESA-listed population is unacceptable and from our perspective it abandons the best available scientific information to solve this problem. The solution is to no longer release fish of hatchery parentage below the weir and to take the necessary precautions to prevent spawning of hatchery fish below the weir. Before fish are released below the weir they should be genetically sampled to determine their heritage.

Review Team Response: *The Team recommended improved marking techniques, which could include genetic markers See also response to Comment 15.*

- 27. Comment:** Regarding recommendation WW-SS3, the Native Fish Society reviewed the various options and the only one that makes sense is switching brood stock from the old production stock to an endemic one. Determine the genetic parentage of these wild-origin stocks by genetic analysis before releasing them as smolts. Release only those that can be verified as endemic. Given the serious problems posed by the stray Wallowa Hatchery steelhead to wild steelhead in other basins, this recommendation should be a priority rather than just one on a list of options. A precedent has already been established for a complete stock make over with Grande Ronde spring chinook where all non-native hatchery fish were removed from the hatchery program and it was retooled using only native spring chinook and making a distinction among the existing subpopulations in the basin. It appears to be inconsistent with the best available science and the precedent established for spring chinook, to punt on a science based steelhead hatchery program.

Review Team Response: *A major uncertainty associated with developing an endemic stock of steelhead for the Grande Ronde River is whether hatchery-origin fish from an endemic stock would stray less than the current Wallowa stock. The Team did suggest that one option could be a tagged-comparative study of stray rates between the Wallowa stock and the Little Sheep Creek stock released from the Wallow FH. See also responses to Comments 2 and 10 above.*

- 28. Comment:** The Native Fish Society agrees with recommendation WW-SS4 and its stated purpose. However, this recommendation calls for a less than 5% stray rate of Wallowa and Big Canyon hatchery fish. While this stray rate is supported by scientific assessment, the value of the wild fish populations in the Wenaha River and Joseph Creek are too important as genetic reserves to risk. Emphasis should be placed on zero stray rates in these two streams. The WDFW hatchery facility on Cottonwood Creek is a particular threat to Joseph Creek and even though this is not part of the present review, your recommendations for this hatchery operation should be included in it to provide a full risk assessment for wild steelhead. The review team does not recommend a protocol for verifying that hatchery-origin fish compose

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less than 5% of the natural spawning population in the Wenaha River and Joseph Creek. We suggest that this be included in the evaluation.

Review Team Response: *The Team recommended that continued monitoring and evaluation of straying of the segregated Wallowa stock be continued to ensure hatchery-origin adults compose less than 5% of the adult steelhead in natural production areas, particularly within Joseph Creek and the Wenaha River. A more detailed M&E plan may need to be developed to fully implement the intent of the Team's recommendation.*

- 29. Comment:** The Native Fish Society supports recommendation WW-SS20 to “continue to monitor the degree of residualism in the release areas and downstream on the Grande Ronde River and continue to implement actions to minimize residualism as much as possible...” However, a target should be developed and verified for providing the most protection for wild steelhead. Reducing residualization rates “as much as possible” may not actually provide the protection required.

Review Team Response: *See responses to Comments 21 and 22 above.*

- 30. Comment:** The recommended alternative maintains the existing program with changes as recommended, but it continues to produce strays that jeopardize wild steelhead in other basins and within the Grande Ronde basin. The hatchery uses a highly domesticated non-native stock to meet mitigation agreements. The review team says, “The continued release of an out-of-basin stock into the Grande Ronde River may ultimately reduce the abundance and viability of naturally produced steelhead.” Since the wild steelhead in the Grande Ronde basin are threatened stock protected under the ESA, this recommendation appears a little anemic. The review team appears to be more concerned about meeting mitigation goals than in recovery of ESA-listed fish. This review notes numerous problems, but the recommendations are too often not specific enough to correct the problems identified. The review team did not address the size of the releases from Wallowa Hatchery and Big Canyon, but doing so is appropriate to reduce risk to wild steelhead and improve chances of recovery. There is expert opinion that wild steelhead are as abundant and viable as they were prior to dam construction on the Snake River when they do not have genetic and ecological impacts from hatchery fish. This review was done from the perspective of the hatchery program and the mitigation agreement rather than from the perspective of wild steelhead recovery. While there are many important recommendations to improve this hatchery program, that is very different from reforming the hatchery program to protect the reproductive success of wild steelhead. It may be that releasing 920,000 non-native hatchery fish in the Grande Ronde River basin is not consistent with wild steelhead protection and recovery under the ESA, but the review team did not specifically address this in its issue assessment. In addition, the review team does not recommend termination of the existing hatchery steelhead broodstock and starting over with a verified native brood stock that would help reduce strays, improve mitigation benefits, and promote recovery of ESA-listed steelhead native to this river.

Review Team Response: *See responses to Comments 2 and 10 above.*

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Stakeholder Forum⁴

Lookingglass Creek Spring Chinook

1. **Comment:** The Review Team's recommendation (LC-SC5) for managing hatchery strays in the broodstock and for passage upstream of the weir is unclear.

Review Team Response: *In the short-term, hatchery strays may contribute to abundance. However, strays should be precluded from the broodstock and passage upstream after the reintroduction goals are achieved and the population becomes self sustaining. The report has been clarified.*

2. **Comment:** The Review Team's recommends a flow index of less than one for rearing spring Chinook at Lookingglass FH. Having a static measure for flow index among hatchery facilities is not appropriate since flow index is a measure of available oxygen at various water temperatures and elevations. The primary concern here appears to be oxygen saturation. For example, Lookingglass FH is higher in elevation and has colder water than Hagerman NFH. If both facilities are operating at a flow index of 1.0, Lookingglass FH would have more oxygen in the water than Hagerman NFH.

Review Team Response: *The Team agrees that there is some flexibility in maximum flow index given differences in elevation and water temperatures among hatchery facilities. The Team recommends that the flow index be less than 1.0 as a "best management practice" and indicates that the maximum flow index be 1.0 "OR" so that flow index results in effluent oxygen levels to be no less than 6 ppm or no less than 80% of oxygen saturation.*

Upper Grande Ronde River Spring Chinook

3. **Comment:** I'm surprise that the Team did not include an alternative for a captive broodstock-only program.

Review Team Response. *Given current habitat conditions in the Upper Grande Ronde River, the Team recommends that the Upper Grande Ronde spring Chinook program continue strictly as a life support system to prevent extinction of the endemic stock. Instead of operating a captive broodstock-only program, the Team concluded that an annual release of 130,000 smolts should result in enough adult returning pairs (60) to maintain the minimum desired effective population size, continue the program, and conserve the stock. The Team recommends that the Safety Net Artificial Propagation Program SNAP captive broodstock program be continued as a security back-up measure for maintaining the stock. If a 130,000 smolt program is not sustainable, then comanagers may have to assess alternatives and priorities for the Upper Grande Ronde River stock compared to other threatened stocks in the ESU.*

⁴ These are excerpts from comments provided by attendees of a Stakeholder Forum held at the Oxford Suites Hotel in Pendleton, Oregon on December 8th, 2009. Responses were provided by Review Team members who attended the meeting and were clarified in subsequent Review Team discussions.

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Catherine Creek Spring Chinook

4. **Comment:** The Team asks the fishery managers to establish numeric escapement goals for each hatchery program but you do not provide guidance for establishing. Why are specific abundance numbers important? I don't believe a goal has to be an absolute number; it could be a range.

Review Team Response: *The Team agrees. The Team is simply requesting that program goals be clearly stated in terms of numeric outcomes that quantify intended benefits. This can be a specific target or a numeric range. That way, the program can be evaluated to determine whether or not the actions being taken are achieving the desired benefits and are appropriate.*

Lostine-Wallowa River Spring/Summer Chinook

5. **Comment:** When referring to the construction of the Northeast Oregon Hatchery (NEOH) facility in this program discussion, is the Team referring to NEOH for both the Lostine and Imnaha programs or just the Lostine program?

Review Team Response: *In this particular section, the Team is referring to the construction of the NEOH facility specifically for the purpose of housing the Lostine River spring Chinook program. This does not preclude the establishment of other programs or portions of other programs at the proposed NEOH facility. The Team has clarified the report.*

Imnaha River Spring/Summer Chinook

6. **Comment:** The Team's alternatives for conservation programs suggest a program size smaller than what Oregon comanagers determined was required to maintain a program that provides conservation benefits (130,000 vs. 150,000 smolt release). The comanagers determined that a minimum of 150 adults (75 pairs) are needed whereas the Review Team concluded that the 60 pairs are sufficient to maintain an effective population size, continue the program, and conserve the stock. Both options assume a minimum smolt-to-adult survival rate of 0.1.

Review Team Response: *The Team's suggested program size for an Imnaha River spring/summer Chinook conservation program is consistent with the Columbia River Hatchery Scientific Review Group's recommendation for a 115,000 smolt release program, but also takes into account the production capacity of individual raceways at Lookingglass FH.*

7. **Comment:** Why didn't the Team rank or prioritize their recommendations?

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Review Team Response: *The Team did not attempt to prioritize the recommendations. Given the differing levels of collaboration and funding required to implement each recommendation, the Team concluded that prioritizing recommendations is best left to the comanagers during the implementation process.*

Wallowa Hatchery Summer Steelhead

8. **Comment:** Did you attempt to make the recommendations for this program consistent with those that the Team made for the Cottonwood Creek (Wallowa stock) hatchery steelhead program in the Washington LSRCP report?

Review Team Response: *Yes. However, to avoid confusion, the Team did not cross reference the two reports.*

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April 2011

