



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

**Columbia River Basin, Columbia Cascade Province**  
*Wenatchee, Entiat and Methow River Watersheds*



**Leavenworth, Entiat and Winthrop National Fish Hatcheries  
Assessments and Recommendations**

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

**April 2007**



## Appendix C: Comments on Draft Report and Review Team Responses

### *Co-Manager Comments and Responses*

#### **Colville Confederated Tribes – Initial Comments<sup>1</sup>**

While the draft identifies restoration objectives of the Colville Tribes Chief Joseph Hatchery Master Plan relative to spring Chinook in the upper Columbia and Okanogan Rivers, there appears to be no specific commitment on the part of the FWS to provide for the donor stock requirements that will be initially required from the Leavenworth Complex hatchery facilities. It appears to be implied in several of the recommendations, but is not specifically identified as an action element. This causes concern on our part and creates uncertainty about whether this hatchery reform effort will assist the Colville Tribes in meeting our salmon restoration objectives in the upper Columbia.

We continue to support increasing salmon harvest in the upper Columbia mainstem, but believe that the first priority for surplus spring Chinook broodstock in the hatchery recommendations should be to initially meet the Chief Joseph Hatchery broodstock requirements before any additional harvest is considered. Once a local broodstock for our hatchery is developed, then a transition to increased harvest can be realized.

**Review Team Response:** *The Review Team believes that the Colville Tribes' proposals to restore spring Chinook to the Okanogan River basin and to create a terminal area fishing opportunity in the upper mainstem Columbia River near Chief Joseph Dam have considerable merit. The Team concluded that an upper Columbia River spring Chinook stock, such as the Methow Composite stock currently being reared at Winthrop NFH, is the appropriate stock of choice for these efforts. The FWS will be coordinating with comanagers to develop specific implementation strategies to carry out the Review Team's recommendations.*

#### **Colville Confederated Tribes – Additional Comments<sup>2</sup>**

1. In reviewing this document, the Tribe was pleased to notice a stronger commitment on the part of the FWS to help meet the initial Chief Joseph Hatchery broodstock requirements for spring Chinook. We are also aware, that as you identified in your response to our initial comments, that the implementation process is where the decisions dealing with broodstock transfers will occur. However, it is imperative that as part of the hatchery reform process, that the Chief Joseph Hatchery spring Chinook broodstock needs be included.

**Review Team Response:** *The Review Team agrees. We envision the future establishment of a comanager task team and the development of planning documents as the first phase of the implementation process. A team dealing explicitly with planning the development of a spring Chinook broodstock for the proposed Chief Joseph Hatchery would be desired.*

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<sup>1</sup> Provided by Jerry Marco, Fishery Biologist, Colville Confederated Tribes (October 5, 2006)

<sup>2</sup> Provided by Jerry Marco, Fishery Biologist, Colville Confederated Tribes (November 13, 2006)

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2. The Leavenworth Hatchery recommendations include a transition from the existing Carson stock to an upper Wenatchee listed stock, contingent on an ESA permit from NOAA that allows for fishing on the Icicle River. The Colville Tribe would be interested in the surplus fish at Leavenworth Hatchery and would be interested in knowing that if fishing is permitted on these fish would the ability to surplus them also be allowed. One of the few benefits the Tribe currently realizes from this program is surplus fish and we have been obtaining them from Entiat Hatchery over the past several years. With that facility identified for a transition to summer Chinook, the only potential source of surplus spring Chinook may possibly be Leavenworth Hatchery.

**Review Team Response:** *The Review Team anticipates that the FWS will pursue this issue as it seeks regulatory approval for transitioning to rearing and management of an in-basin Wenatchee River spring Chinook broodstock. We expect also that the FWS will consult with co-managers concerning future priorities for best uses of fish surplus to broodstock needs at Leavenworth NFH.*

3. The Entiat Hatchery spring Chinook program overview section identifies 100 adults as being collected for an experimental restoration study by the Colville Tribe. This was discussed several years ago, but was never initiated. However, over the past several years the Tribe has received 50,000 spring Chinook pre-smolts in late October for over-winter acclimation and release in Omak Creek that were reared at one or more of the Leavenworth Complex Hatchery facilities. This program, while discontinued this year, has provided a benefit to the Colville Tribe and should be included in the report as such. Adult spring Chinook have returned in small numbers to Omak Creek, a tributary to the Okanogan River that is located entirely within the bounds of the Colville Indian Reservation and provided the Tribe the ability to conduct a “First Salmon Ceremony”, the first such ceremony in over sixty years. The Tribe would be interested in re-initiating this program as an interim measure at one of the hatchery facilities, until the Chief Joseph Hatchery spring Chinook adults return to Omak Creek.

**Review Team Response:** *The Review Team places high priority on traditional tribal harvests of salmon and steelhead, including ceremonial, subsistence, and commercial fisheries. The pre-smolt transfer was supported for four years from our Leavenworth complex facilities with agreement of the co-managers. Re-initiation of the program would be contingent upon renewed agreement from the co-managers and identification of a Leavenworth complex facility that could support a small reintroduction program for Omak Creek that would not negatively affect other program needs of the hatchery. The Team encourages the Colville Tribe to conduct further discussions on this issue with the Service and other co-managers.*

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#### **Yakama Nation<sup>3</sup>**

##### ***Leavenworth NFH***

1. Preserving existing harvest opportunities and increasing future harvest opportunities is the top priority of the Yakama Nation. ... As noted in the report, the Leavenworth NFH provides an extremely significant fishery benefit to the Yakama Nation. The current spring Chinook program at the Leavenworth NFH is integral to the tribe's harvest regimes. Spring Chinook are highly valued by the Yakama Nation, and Icicle Creek is essentially the only location in the mid-Columbia region where the Yakama Nation can fish for spring Chinook. We support the conclusions of the FWS Review Team that preservation of those fishery benefits in Icicle Creek should be of the highest priority. ... Consequently, the Yakama Nation would be resistant to any changes at the Leavenworth NFH that would reduce or jeopardize the existing fishery benefits in Icicle Creek. We believe the current spring Chinook program at the Leavenworth NFH is an extremely valuable one with great smolt-to-adult survivals and adult returns. We further believe: "If it ain't broke, don't fix it." On the other hand, we do recognize the need to consider other issues and management goals. ... We believe that increasing the robustness of upper Wenatchee River stocks should be a higher priority than transitioning to a new broodstock at the Leavenworth NFH. On the other hand, we are not opposed to the principle of transition, but only as long as harvest benefits are retained at current levels.

***Review Team Response:*** *We appreciate the concerns of the Yakama Nation regarding transitioning to another stock at the Leavenworth NFH. We agree that the current program is very successful at providing fishery benefits to tribal and recreational fishers. Consequently, in response to this concern, we have recommended a study that compares the performance and return rates of Chiwawa River hatchery fish and Leavenworth NFH fish when both groups are reared and released at Leavenworth NFH (Recommendation LE1c). Based on existing smolt-to-adult survivals for Chiwawa River hatchery fish released into the Chiwawa River, we believe their smolt-to-adult survivals at Leavenworth NFH would be similar to those for the current Leavenworth NFH stock.*

2. **Rearing densities.** The Yakama Nation is opposed to any reductions in program production to achieve lower rearing densities of spring Chinook that would result in reduced numbers of returning adults back to Icicle Creek. Before any change in the production program is implemented, an experimental "side by side" test should be conducted for at least a couple of brood years. We understand that low water flows and high temperatures increase fish health risks during the summer months. However, we do not believe reducing the size of the spring Chinook program at the Leavenworth NFH is the solution. Alternatively, we believe additional sources of water need to be found or allocated to the hatchery so that existing programs can be maintained at their current mitigation levels.

***Review Team Response:*** *Our recommendation to reduce rearing densities for spring Chinook at Leavenworth NFH is a precautionary measure that was predicated, to some degree, by a deteriorating water intake pipe that needs replacement and, thus, jeopardizes the survival of on-station fish. We further noted in our recommendations that replacement of the water intake pipe for the hatchery should encompass a holistic strategy that addresses other water issues in Icicle Creek (e.g., other water allocations and withdrawals, instream flows, etc.). The Review Team concluded that fish health concerns and the desire for increased margins of safety warranted a*

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<sup>3</sup> Provided by Steve Parker and Tom Scribner, Fisheries Resource Management, Yakama Nation

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*reduction in rearing densities at the present time to a level that would increase individual fish survival rates without reducing total adult returns. Previous studies conducted at Leavenworth NFH (BY1994, BY1995, and BY1996) indicated that adult returns per raceway are maximized at final rearing density indexes of 0.15-0.17 (Appendix B). We suggest also, in our revised report, that some raceways could continue to be loaded at current densities to test, via “side-by-side” comparisons, adult return predictions based on the earlier study.*

3. **Broodstock transition.** The following conditions and uncertainties need to be resolved before we could endorse transitioning to a new spring Chinook broodstock at the Leavenworth NFH:
  - a. A detailed contingency plan for developing and maintaining a new broodstock would need to be developed for comanager review. This plan would need to have clear numerical guidelines (e.g. via a sliding scale) for disposition of adult spring Chinook trapped at Tumwater Dam and the Leavenworth NFH. For example, if the Chiwawa River program was not able to meet its escapement or broodstock goals in low adult return years, we would need guarantees that fish returning to the Leavenworth NFH would not be automatically used to meet those goals without comanager and tribal agreement. We believe there could be significant comanager pressure to reduce the number of adult spring Chinook retained for broodstock at the Leavenworth NFH in low return years to meet broodstock and escapement goals in the upper Wenatchee River.

***Review Team Response:*** *Before the Leavenworth NFH would begin transition to a local spring Chinook broodstock, the Service and comanagers would need to develop a broodstock management plan that would guide the process and resolve issues such as low numbers of returning adults and priority use. The management plan would attempt to address all contingency situations in development and maintenance of a local broodstock. The Service understands its Tribal Trust responsibilities in maintaining the tribal fishery on Icicle Creek and would prioritize those responsibilities as part of the broodstock management plan.*

- b. The performance of the new broodstock at the Leavenworth NFH would need to be evaluated side-by-side with the existing broodstock. This would require the propagation of both stocks at the Leavenworth NFH for at least a couple of brood years. Only if the new broodstock is capable of achieving post-release survivals and adult returns comparable to the existing broodstock would the Yakama Nation accept transition to the new broodstock.

***Review Team Response:*** *See response to Comment #1*

- c. The Yakama Nation would need guarantees that adult fish from the new broodstock could be harvested in Icicle Creek and other locations at the same levels that are currently allowed for the existing hatchery stock.

***Review Team Response:*** *The Review Team has recommended that the FWS seek concurrence and any necessary regulatory approvals from NMFS and WDFW for the continued conduct of the Icicle Creek terminal fishery prior to proceeding with transition to a within-basin spring Chinook broodstock. Chiwawa Hatchery fish are currently 100% adipose fin-clipped and are already vulnerable to mainstem Columbia River fisheries. The Review Team believes that the terminal fishery in Icicle Creek on the proposed hatchery stock at Leavenworth NFH would be less intrusive on recovery goals for Wenatchee River spring Chinook than present mainstem interceptions.(see also NOAA Fisheries comment #14).*

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4. **Differential marking/tagging of Leavenworth NFH and Chiwawa Hatchery fish.** The Yakama Nation does not agree with the conclusions of the FWS Review Team that fish from the Leavenworth NFH pose a “significant” genetic risk to naturally spawning populations in the upper Wenatchee River. From the Nation’s perspective, the issue is primarily one of management, not biology. Consequently, we endorse the Review Team’s recommendation to differentially mark spring Chinook produced for the Chiwawa River and Leavenworth NFH programs so that the latter fish can be selectively removed at Tumwater Dam. Differential marking/tagging is much simpler than transitioning to a “Wenatchee River broodstock” at Leavenworth NFH.

**Review Team Response:** *In general, the Review Team agrees that differential marking/tagging and removal of Leavenworth NFH fish at Tumwater Dam is simpler than transitioning to a new broodstock. On the other hand, the Review Team also concluded that transitioning to a native Wenatchee River broodstock would not only reduce risks to listed spring Chinook, but it could also confer a long-term conservation benefit by reducing extinction probabilities of the Upper Columbia Spring Chinook ESU. The Review Team believes that reducing those probabilities will provide valuable conservation benefits.*

5. **Fish passage in Icicle Creek.** The Yakama Nation has concluded that the opportunities to maintain a self-sustaining natural population of spring Chinook in Icicle Creek are extremely limited. We concur with the FWS Review Team that potential habitat for spring Chinook terminates at the boulder field at RM 5.5. Although we agree in principle with providing passage to upstream migrating salmonids in Icicle Creek, this passage should not reduce harvest opportunities for spring Chinook if the Leavenworth NFH transitions to a within-ESU stock.

**Review Team Response:** *For the reasons outlined by the Yakama Nation, we concur that the opportunities for a self-sustaining natural population of spring Chinook in Icicle Creek are limited.*

#### **Entiat NFH**

6. We concur with the FWS Review Team’s assessment that the current spring Chinook program at the Entiat NFH is not providing tangible harvest benefits. Therefore, we are not opposed to its termination as long as it can be replaced with a program (or programs) that do provide benefits. However, we are opposed to a weir at the hatchery. We believe all fish should be free to volitionally move upstream.

**Review Team Response:** *Our recommended alternative for the Entiat NFH, as outlined in our final report, would not involve the immediate release or trapping of hatchery-origin fish in the Entiat River. Consequently, a weir would not be necessary for the hatchery in the near term under the revised recommended alternative.*

7. The Yakama Nation currently depends on the adult holding and spawning facilities at the Entiat NFH for the tribe’s coho restoration program. At the present time, the spawning of spring Chinook is complete before the adult facilities are needed for coho salmon. However, summer Chinook spawning would present a facilities conflict with coho holding and spawning. ...For this reason, we encourage the FWS and BOR to reconsider changing the program at Entiat NFH to a coho program (an identified alternative)

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**Review Team Response:** *The Review Team received little support for its proposal to initiate a summer Chinook program at Entiat NFH in order to provide increased local fishery benefits. Consequently, we withdrew our recommended alternative for a summer Chinook program (Alternative 3) and are proposing instead a new role as a conservation facility for upriver stocks (Alternative 4). This latter alternative includes reintroduction programs such as the Yakama Nation's coho reintroduction program. The team agrees that the coho reintroduction program is a high priority and supports its continuation..*

#### Winthrop NFH

8. **Spring Chinook.** Issues for spring Chinook in the Methow River are complex. We believe these issues within the Methow River need to be resolved before fish are used to help restore spring Chinook in the Okanogan River or are used to develop a new hatchery program at Chief Joseph Dam.

**Review Team Response:** *As noted in our recommendations, we believe the comanagers should develop a comprehensive management plan for the Methow River that redefines the roles of the Winthrop NFH and the Methow State Hatchery. This plan should include provisions for assisting with recovery of spring Chinook in the Methow River, providing harvest opportunities, and reintroducing spring Chinook to the Okanogan River.*

9. We have reservations about the effectiveness of all tributary weirs in being able to efficiently follow agreed to adult collection protocols especially those in the Methow basin. Before major funds are invested in the reconstruction of Foghorn Dam or construction of a new weir structure in the Methow River to trap wild fish for inclusion in the Methow Composite stock, a thorough evaluation of pros and cons of trapping at these sites versus Wells Dam (100% effective) should be completed. We currently believe Wells Dam is the easiest and most expedient location to trap wild spring Chinook adults for integration into the Methow Composite broodstock.

**Review Team Response:** *The team believes that Methow River broodstocks are best managed by collection and sorting capabilities within the Methow River Basin. Future collection of adult spring Chinook broodstock of uncertain origin at Wells Dam as a long-term strategy would be inconsistent with the proposed reintroduction of spring Chinook at upriver sites such as the Okanogan River. The team does agree that fish collection and sorting needs within the Methow River Basin be carefully evaluated and individual program needs integrated to assure practical and cost-effective fish trapping and handling capabilities that meet co-manager objectives. The Review Team acknowledges that trapping natural-origin spring Chinook at Wells Dam for integration into the Methow Composite broodstock is a potential interim option, and is preferred to collecting no natural-origin fish if collection of broodstock in separate sub-basins is not possible.*

10. We do not believe the size of the spring Chinook program at the Winthrop NFH should be reduced until all conservation options within the Methow River have been exhausted. Rather than constructing a weir on the Methow River, we believe greater release efforts should be expended to recover spring Chinook in the Methow River basin. Multiple release sites throughout the watershed – with or without acclimation facilities - may be necessary to spread returning adults into all available spawning habitats and maximize natural reproduction by hatchery-origin adults.



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**Review Team Response:** *The comprehensive management plan recommended by the Review Team for the Methow River basin should specify the number, location, and life history stages of hatchery-origin spring Chinook released throughout the basin to supplement natural populations for the purpose of assisting with recovery. Total releases of hatchery-origin spring Chinook would then be specified, and the programs at the Methow State Hatchery and Winthrop NFH could be sized based on ecosystem capacities and goals. At the present time, the programs at the two hatcheries are sized according to the capacities of the facilities and not the capacities of the habitat or objectives for natural populations. WDFW's HGMP for spring Chinook in the Methow River specifies a similar need for multiple release and acclimation sites.*

11. **Steelhead**. We do not support increasing the scope and/or size of the steelhead program at the Winthrop NFH at the expense of spring Chinook production. From the tribe's perspective, spring Chinook is the first priority species in the Methow River and the region.

**Review Team Response:** *The Review Team concurs that the artificial propagation needs of spring Chinook within the region are a higher priority than those for steelhead. We have modified our report accordingly, noting that the Service should address our recommendations for spring Chinook at each of the three hatcheries as a higher priority than addressing our specific recommendations for steelhead at the Winthrop NFH*

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### Washington Department of Fish and Wildlife (WDFW)

#### *Leavenworth NFH*

1. The conversion of broodstock source at LNFH from non-local to local stocks would likely reduce the genetic risks to local stocks. However, this assumption should be compared with actual stray rates observed between local and non-local broodstocks over time to ensure the expected outcome is observed. The WDFW encourages FWS to conduct a PIT tagging study during the transition period to monitor stray rates of non-local and local derived fish. Assuming no significant increase in stray rate is detected, the reduction in risk to the naturally spawning population upstream of Tumwater Dam would be realized.

**Review Team Response:** *The rationale for transitioning to an endemic Wenatchee River stock at Leavenworth NFH is not based strictly on the need to reduce straying risks (see Review Team response to comment #4 of Yakama Nation). Transitioning to a local stock also confers a conservation benefit to the Upper Columbia Spring Chinook ESU by reducing overall extinction risks. Ultimately, regardless of stray rates from Icicle Creek, the passage of hatchery-origin fish at Tumwater Dam should be controlled to be consistent with genetic management guidelines (Mobrand et al. 2005<sup>4</sup>). This latter requirement applies to Chiwawa River hatchery fish also. Consequently, differentially marking or tagging fish from different hatchery programs is the most expedient way to reduce straying risks associated with upstream passage at Tumwater Dam.*

2. Successful conversion of LNFH to a locally derived broodstock is contingent on improvements to the water supply at the hatchery, sufficient availability of locally derived hatchery spring Chinook and National Marine Fisheries Service (NMFS) assurance that Chinook originating from the LNFH program are produced for harvest. Given the current status of local spring Chinook stocks, the WDFW would encourage the FWS and Bureau of Reclamation (BOR) to develop an accelerated implementation program of the specific facility improvements, and attain NMFS assurance of harvest priority for the LNFH program. In addition, the FWS should convene a meeting of the JFP<sup>5</sup> to identify the best strategies for accomplishing shared objectives with an agreed to timeline for implementation.

**Review Team Response:** *The FWS is working with BOR to address these issues. The FWS plans to convene a meeting with comanagers and joint fisheries partners in early summer to begin developing specific implementation plans.*

#### *Entiat NFH*

3. WDFW concurs that the current spring Chinook program poses genetic and ecological risks to the local spring Chinook population designated for recovery in the regional salmon recovery plan... . Two species for further consideration include summer Chinook and coho.

**Review Team Response:** *Based on the comments received from comanagers and stakeholders on our draft report, we concluded that conservation, recovery, and reintroduction of species of high*

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<sup>4</sup> Mobrand, L. et al. 2005. Hatchery reform in Washington State: principles and emerging issues. *Fisheries* 30(6): 11-23.

<sup>5</sup> Joint Fishery Partners (JFP) are WDFW, USFWS, NMFS, Yakama Nation, and Colville Confederated Tribes

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*conservation or harvest importance was a higher priority currently than providing direct harvest benefits in the Entiat River. Consequently, recovery of spring Chinook and reintroduction of coho salmon would have higher priorities than summer Chinook under our updated recommended alternative (Alternative 4) for the Entiat NFH.*

#### **Winthrop NFH**

##### Spring Chinook

4. The development of a joint comprehensive or coordinated Hatchery Genetic Management Plan (HGMP) for Methow Basin spring Chinook, including the goal(s), objectives, and operational details for both hatcheries is an important next step towards minimizing the risks the hatchery program(s) post to the natural production while ensuring the facilities operate in concert towards achieving their overall goal(s). ... Adult escapement goals would need to be formalized (abundance and origin composition) in order to determine the number of spring Chinook above the broodstock and natural spawning needs.

**Review Team Response:** *We agree. In their full letter, WDFW has accurately summarized the Review Team's recommended alternative for spring Chinook at Winthrop NFH (Appendix D). The excerpted comment above is consistent with the Team's recommendation to redefine the roles of Winthrop NFH and the Methow State Hatchery relative to conservation and harvest goals within the Methow River watershed.*

5. The WDFW would like to discuss the possibility of developing a small terminal fishery in the WNFH outfall stream.

**Review Team Response:** *We believe the small outflow channel from the Winthrop NFH to the Methow River is an inappropriate location for a terminal fishery on hatchery-origin spring Chinook (or steelhead). Fishing on the relatively narrow channel, which lies solely on private property, would ultimately lead to extensive snagging, bank erosion, and a potentially crowded situation. Potential alternative options such as the stretch of the Methow River from the hatchery outflow channel downstream to the Methow Valley Irrigation District diversion dam, a distance of approximately five miles could be evaluated for a terminal fishery. This region is well upstream of the Twisp River (approximately five miles) and would minimize incidental harvest mortality on the Twisp River stock.*

##### Steelhead

6. An increase in the number of steelhead released into the Methow River from WNFH would require adjustments to the current Wells steelhead program to comply with the cumulative production of Upper Columbia River (UCR) steelhead above Wells Dam authorized through ESA permits 1395, 1396 and 1412. ... WDFW may support a change from the current program provided that improvements to Foghorn Dam result in an adequate broodstock trapping opportunity. Migration timing of steelhead upstream of Foghorn Dam is currently unknown, but it is highly probable most of the broodstock would be collected in the spring. This may pose challenges to achieving optimal release sizes [of progeny one year later]. [WDFW notes additional logistic problems in their full letter in Appendix D]

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**Review Team Response:** *Many logistic problems need to be resolved if our recommendations for steelhead at Winthrop NFH are to be implemented. Collecting natural origin broodstock within the Methow River basin is problematic at this time; yet, conservation goals for steelhead in the Methow River necessitate within-basin broodstock collections if hatchery programs are to contribute to recovery of natural populations and achievement of conservation goals. The Review Team assumed that the principal goal of the Wells-Methow steelhead program is to contribute to rebuilding and recovery of naturally spawning populations in the Methow River, as described in WDFW's HGMP<sup>6</sup>. Alternatively, steelhead programs can remain small if the stated purpose is simply to support terminal fisheries. Collecting broodstock at Wells Dam and releasing limited numbers of progeny in downstream areas of the Methow River may be one short-term compromise that provides terminal fishery benefits while minimizing risks to natural populations. Long-term plans should refocus on conservation goals in the future.*

7. Differential marking schemes should be developed and implemented immediately in order to estimate the emigration and survival rates of the WNFH steelhead independently from those fish reared at Wells FH.

**Review Team Response:** *Beginning with BY2006, all steelhead juveniles released from Winthrop NFH will be coded wire tagged. These fish will thus be distinguishable from steelhead reared at Wells Hatchery.*

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<sup>6</sup> According to WDFW's HGMP, the purpose of the Wells-Methow summer steelhead hatchery program is to mitigate for steelhead losses associated with Wells, Wanapum, and Priest Rapids dams, and "contribute to the rebuilding and recovery of naturally reproducing populations in their native habitats, while maintaining genetic and ecological integrity and supporting harvest."

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### NOAA Fisheries , National Marine Fisheries Service (NMFS)

#### *Summary*

1. **Review Team Note:** NMFS provided several comments regarding genetic straying risks of fish from Leavenworth NFH. NMFS also had several comments regarding the Review Team's recommendation to differentially mark or tag Chiwawa River and Leavenworth hatchery-origin fish prior to release. These comments are collated here.

A primary risk of the Leavenworth program to conservation is the straying of program fish to spawning areas above Tumwater Dam. This risk is not created because Chiwawa Program fish are marked similarly, rather the risk is created by Leavenworth fish straying.

The marking scheme for the Chiwawa spring Chinook salmon program should not be the focus of assessing Leavenworth NFH program impacts. The adipose fin-clip is used throughout the Pacific Northwest as an indicator of hatchery origin fish. The salient issue is that Leavenworth NFH program fish stray and are a risk to ESA-listed spring Chinook.

The reduction of stray Leavenworth NFH fish into the areas above Tumwater Dam is important to lower the risk to the ESA-listed population. Recommending a change to the Chiwawa Programs marking strategy does not adequately address this issue as it would not be a positive indicator of Leavenworth NFH fish and no sorting or removal of spring Chinook occurs at Tumwater Dam (except for broodstock collection for the Chiwawa Program) at this time.

Recommendation LE1 should identify a unique mark or tag that could be applied to Leavenworth NFH fish. ... The basis for identifying Leavenworth NFH fish should be a positive mark, rather than a negative or lack of identifier as would be the case if the Chiwawa Program received an additional mark.

**Review Team Response:** See our response to Comments #4 and #1 of the Yakama Nation and WDFW, respectively. We agree – in principle - with Comment #4 from the Yakama Nation that the most expedient way to reduce genetic risks to natural populations of spring Chinook in the upper Wenatchee River is to differentially mark or tag Chiwawa River and Leavenworth hatchery-origin fish and remove Leavenworth NFH fish at Tumwater Dam. At the present time, we understand that all spring Chinook ascending Tumwater Dam are physically handled and biosampled prior to passage upstream as part of a genetic study to assess the natural reproductive success of hatchery and natural origin spring Chinook in the upper Wenatchee River. Consequently, the USFWS is currently exploring tagging options to differentially remove Leavenworth NFH adults at Tumwater Dam and will be working with WDFW and Chelan PUD regarding options and forthcoming recommendations. To address long-term conservation goals, the Review Team further recommended that Leavenworth NFH transition to a “within ESU,” Wenatchee River stock. (See also our response below to Comment #3 from NMFS.)

2. The demographic risk associated with water intake and lack of passage in Icicle Creek also relate to conservation risks. Potential facility failures are a risk to the program and could affect the ability of the program to meet harvest goals.

**Review Team Response:** We agree. If the water intake fails, there would be a negative effect on the benefit this propagated stock contributes to tribal and non-tribal harvests. There is also a demographic risk to other stocks and species associated with improper screening of the water

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*intake and possible entrainment into the hatchery water system. Inadequate fish passage at the hatchery is identified as a demographic risk to other species, including ESA-listed bull trout and steelhead.*

3. Risks: The risk of program fish straying into the natural environment is the primary genetic risk of the program. The presumed cause is that rearing the fish on well water and not on Icicle Creek water reduces their homing fidelity

**Review Team Response:** *Well water constitutes, at most, only 5-10% of the rearing water during the coldest two months of winter and the warmest two months of summer. Otherwise, fish are reared on 100% Icicle Creek water. Consequently, we do not believe that the use of well water to modulate water temperature is the cause of “straying” of hatchery-origin spring Chinook from Leavenworth NFH and Icicle Creek. Although the actual stray rate from Icicle Creek is less than 3%, their composition among fish passed upstream at Tumwater Dam exceeds 30% because of the very low abundance of upriver stocks.*

4. WDFW reports in their *Oncorhynchus mykiss*: Assessment of Washington State’s Anadromous Populations and Programs [Edited by James B. Scott, Jr., William T. Gill, dated July 21, 2006 historical database appendix for UCR steelhead] that the 1998-2000 average natural origin escapement [at Wells Dam] was 368 and the 2001-2004 average natural-origin escapement was 835 [not 901 and 5,640 adults, respectively, as originally reported in the FWS draft report].

**Review Team Response:** *The numbers stated by NOAA are correct except the 835 should be 836. We have made these corrections in our final report.*

5. [The early portion of the report] indicates that the short and long-term goals were important to understand, but these goal timeframes do not appear to be carried forward in the rest of the document.

**Review Team Response:** *Recommendations for current programs address immediate needs and short-term goals. Some alternatives also address short-term goals. The majority of the potential program alternatives identified by the Team are intended to address long-term goals and future conservation and harvest needs. We have modified the report at several points to clarify and emphasize these distinctions.*

### ***Leavenworth NFH***

6. In recent discussions in the Habitat Conservation Plan (HCP) Hatchery Committee, FWS staff have indicated that the culling of egg based on titer levels of Bacterial Kidney Disease (BKD) antigen have reduced the prevalence of *R. salmoninarum* in the Leavenworth NFH program, this is not reflected in this report.

**Review Team Response:** *Information regarding reduced prevalence of BKD among hatchery-origin fish is now included in the report.*

7. What percentage of Icicle Creek monthly flow is diverted to the Leavenworth NFH? What percentage of Nada and Snow Lakes water is diverted to the facility?

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**Review Team Response:** The following table provides information on monthly water flows and diversions in Icicle Creek. “IPID” represents the Icicle-Peshastin Irrigation District, the diversion for which is upstream of the hatchery intake and immediately upstream of the boulder field. Icicle Creek water is over allocated during the summer months and is supplemented with deliberate releases from Nada and Snow Lakes. Beginning in 2006, Leavenworth NFH has annually released 50 cfs from the Snow Lake reservoir system between July 20 and September 30 (Biological Opinion for Operation and Maintenance of Leavenworth NFH. USFWS. August 2006)

**Results of Hydrologic Analyses – Average Flow Year - 1998**

Month	Inflow and Outflow (cfs)					Instream Flow downstream of LNFH diversion (cfs) (=)
	Icicle Creek at USGS gage	IPID (-)	City (-)	Snow Creek (+)	LNFH & CO (-)	
Jan	227.6	-	2	9.0	38.2	196.4
Feb	188.8	-	2	32.3	44.6	174.6
Mar	296.9	-	2	21.6	46.0	270.5
Apr	571.9	68.6	2	23.7	40.1	485.0
May	1,929.7	88.2	2	56.0	28.4	1,867.1
Jun	1,331.8	96.1	2	29.6	42.4	1,220.9
Jul	486.5	99.3	2	43.5	48.2	380.4
Aug	180.1	98.3	2	36.6	47.2	69.3
Sep	98.5	78.5	2	43.3	44.0	17.3
Oct	94.8	-	2	33.5	41.1	85.2
Nov	259.6	-	2	3.9	41.6	219.9
Dec	291.8	-	2	9.0	38.0	260.8

Note: Icicle Creek at USGS gage flows are for 1998, IPID diversions are averaged from 1990-1991, City of Leavenworth diversion is assumed to be 2 cfs, Snow Creek flows are averaged from 1994-2002, LNFH & CO diversions are averaged from 1991-2001.

8. What is the smolt survival rate from release to McNary and/or to Bonneville Dam?

**Review Team Response:** The mean survival rates (PIT tag detection rates) of spring Chinook smolts from Leavenworth, Entiat, and Winthrop NFHs to McNary Dam were estimated as 54.8, 58.8, and 49.9%, respectively (2002-2005). The mean travel times of spring Chinook smolts from Leavenworth, Entiat, and Winthrop NFHs to McNary Dam were estimated as 26.8, 21.7, and 27.1 days, respectively (2002-2005). These data are reported on page 33 in reference document #MC-008 ([www.fws.gov/fisheries/Pacific/hatcheryreview](http://www.fws.gov/fisheries/Pacific/hatcheryreview)).

9. Facility security is not mentioned as an issue; however 200 adult salmon were stolen from the facility this year. Lack of facility security is a risk to the hatchery program.

**Review Team Response:** We acknowledge that security continues to be a risk at Leavenworth NFH. However, the following security measures have been implemented at Leavenworth NFH since the poaching incident in the late spring 2006: (a) locks on the main hatchery gate and adult holding ponds have been changed and are not the same; (b) security signs and increased lighting have been installed around the adult holding ponds; (c) nets are now stored in a different building away from holding pond; (d) fish crowders are locked together and to a fence post; and (e) the Service has requested that the Chelan County Sheriff patrol the hatchery when it is closed and adult fish are on station.

10. What was the smolt production in Peshastin and Ingalls Creek following the adult plants into those creeks?

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**Review Team Response:** *The Service outplanted 350 hatchery adult spring Chinook into Peshastin and Ingalls Creeks in 2003. We estimate that those fish constructed 60 redds, deposited an estimated 276,000 green eggs, and yielded an estimated  $4,829 \pm 790$  (estimate  $\pm$  95% confidence interval) “true” subyearling migrants at ~80 emigrants per redd or 14 emigrants per outplanted adult. However, only three yearlings were actually captured the following spring. PIT tags were applied to 2,518 subyearlings during the late summer of 2004, yielding a downstream survival and mean travel time to Bonneville Dam of 6.2% and 242 days, respectively (data provided courtesy of Columbia Basin Research analysis tools at: <http://www.cbr.washington.edu/>). Of the estimated 14 migrants produced per outplanted adult, an estimated 297 smolts from the 350 outplanted adults ever reached the ocean (i.e., 0.86 ocean-going smolts per outplanted adult). Evaluations for brood year 2004 are still in progress. (Data from Cooper, M. and S. Mallas. 2005. Peshastin Creek Smolt Monitoring Program, Annual Report March 2004 – December 2004. U.S. Fish and Wildlife Service, Mid-Columbia River Fishery Resource Office, Leavenworth, WA).*

11. NMFS does not believe that Leavenworth NFH spring Chinook are a “potential back-up” stock for recovery of the Wenatchee River population as they are not included in the ESU (70 FR 37160) and therefore are not appropriate for use for conservation or recovery purposes.

**Review Team Response:** *We agree with NMFS and have modified this reference in our revised report. We were not advocating that spring Chinook currently propagated at Leavenworth NFH should have a recovery role. We intended to simply note, as one “pro” of the current program, that the current Leavenworth NFH stock could be used for reintroduction if natural populations became functionally extinct and other hatchery stocks representing the Upper Columbia Spring Chinook ESU are not available. The current introduced stock has been propagated at Leavenworth NFH for approximately 30 years and is considered highly successful (see comments of Yakama Nation).*

12. The risk of Leavenworth NFH strays into the natural environment could also be reduced by reducing the program size. This possibility is mentioned on the next page relative to limited water for rearing, but should be considered as one potential option in relation to the genetic risks to the ESA-listed population

**Review Team Response:** *We have recommended reducing rearing densities as a precautionary measure related to fish health issues. Such reductions are expected to have little or no impact on adult returns and harvest benefits in Icicle Creek. Conversely, we do not believe the program size should be further reduced in size to reduce genetic risks because such reductions would substantially reduce harvest benefits. The Review Team concluded that differential marking or tagging, coupled with selective removal of Leavenworth NFH spring Chinook at Tumwater Dam, would yield the highest benefit-risk ratio as a short term solution to the genetic risks posed by the current program.*

13. Recommendation LE3 of selective breeding for an early return timing does not appear to be consistent with the FWS preferred alternative 3 of transitioning broodstock to surplus returns from the Chiwawa Program.

**Review Team Response:** *Selectively breeding for earlier return timing would be one option for reducing straying risks from Leavenworth NFH if (a) straying rates are shown to increase during the latter part of the run when summer water temperatures may deter spring Chinook from entering Icicle Creek and (b) transitioning to a local Wenatchee River broodstock is delayed or logistically difficult to implement.*



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14. Alternative 2 would require an ESA permit under Section 10 of the Act, but not a “special” permit. Current fisheries already require an ESA section 10 permit. The hatchery program is currently authorized under an ESA section 7 incidental take statement; this [new] alternative would require a section 10 permit. ... A terminal harvest on spring Chinook salmon not needed for recovery purposes can be authorized under the ESA in a section 10 permit, as was done with UCR steelhead, not through a Memoranda of Understanding. A determination of an “experimental population” would preclude activities such as harvest by regulation.

**Review Team Response:** *We have corrected our report in response to this comment. We believe a directed terminal harvest in Icicle Creek on the proposed stock at Leavenworth NFH would be less intrusive on recovery goals for Wenatchee River spring Chinook than incidental harvests in mainstem Columbia River fisheries.*

15. The phasing out of the [of the existing Leavenworth NFH stock] program is not clear. We assume that to mean if hatchery fish from the Chiwawa Program are available to completely replace the broodstock at Leavenworth in any given year, then the broodstock would be replaced in it's entirely. It would only be in years where there was not sufficient surplus fish at Tumwater Dam that any fish returning to the Icicle would be used.

**Review Team Response:** *If approved, the USFWS and comanagers would need to develop an implementation plan for transitioning to a new broodstock. The Team envisions at least five years (one salmon generation) during the transition in which two stock of fish might be reared at Leavenworth NFH (see our response to Comment #1 of the Yakama Nation). We anticipate that the transition would be completed during the second generation (years 6-10) if adult returns for the new stock are similar to those for the existing stock. If replacement of the current hatchery stock with Chiwawa River hatchery fish does occur, then we envision a future program in which approximately two-thirds to three-fourths of the broodstock would be derived annually from adult returns back to Leavenworth NFH and approximately one-fourth to one-third would be derived from Chiwawa River hatchery fish trapped at Tumwater Dam.*

16. Alternative 5: NMFS supports the variable program level alternative to the spring Chinook program and believes that if this approach is taken in the next few years, the likelihood is that sufficient numbers of spring Chinook from the Chiwawa Program would be available and little reduction of the Leavenworth program would be anticipated other than what has been proposed related to the limited water supply.

**Review Team Response:** *Alternative 5 (as proposed) would adopt the general concept of our recommended alternative (Alternative 3) but would vary the number of spring Chinook spawned for broodstock annually depending on the availability of hatchery fish from the Chiwawa River program. In low return years for the Chiwawa River hatchery stock, available space and water at Leavenworth NFH could be used to rear summer Chinook. Hence, Alternative 5 requires the maintenance of two programs (spring Chinook and summer Chinook) that could each vary in size annually depending on the availability of surplus Chiwawa River hatchery spring Chinook. The Review Team did not support this alternative as a long-term goal for a number of reasons, including logistic problems with trying to maintain two variable-size programs at the hatchery and questions regarding the need for another summer Chinook program in the Wenatchee River (see our “cons” statements). The team concluded that a new spring Chinook program comparable in size to the current program would provide the greatest fishery and conservation benefits while reducing risks to listed spring Chinook in the Wenatchee River (i.e. Alternative 3).*

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17. An integrated spring Chinook program at Leavenworth NFH would reduce the risks associated with the straying of fish from the current program. We believe that the integrated “stepping stone” program concept has merit and should be further pursued. Considering the release levels of spring Chinook from the Chiwawa program in recent years and the good return levels, a transition to the local stock could occur relatively quickly. ... Because the Chiwawa Program is likely to be reduced, at least by 2013, the FWS should not delay a transition to local stock.

**Review Team Response:** *We concur. However, we believe the water intake system for the hatchery should be replaced before the transition is initiated. We further identified replacement of the water intake pipe as the top implementation priority among the three Leavenworth Complex hatcheries.*

#### **Entiat NFH**

18. Since the program is intended to operate as a segregated program, the description of habitat [in Table 16] should be the hatchery habitat, not the natural environment.

**Review Team Response:** *One purpose of the stock tables (e.g., Table 16) is to summarize the Review Team’s understanding of the status of each salmonid stock within a watershed. One of the premises of our evaluations is the need to evaluate hatchery programs in the context of the ecosystems on which they depend. Such a perspective is needed for understanding benefits and risks, particularly for segregated hatchery programs in which hatchery-origin fish may compete directly with natural-origin fish in the habitat of the latter. The “hatchery habitat” is included with our evaluation (i.e., assessments and recommendations). The status of the natural habitat is one of the premises on which those evaluations are based.*

19. Alternative programs should be explored further. Implementing a summer Chinook salmon program at Entiat NFH should be evaluated cognizant of high numbers of summer Chinook already being released from other hatchery programs in the vicinity.

**Review Team Response:** *In its initial draft recommendations, the Review Team proposed that the existing segregated spring Chinook program be discontinued as soon as possible and replaced with an integrated summer Chinook harvest program. NOAA Fisheries and other co-managers suggested higher priority recommendations for consideration. Accordingly, the team has withdrawn the summer Chinook recommendation and replaced it with another recommended alternative in the final review report.*

#### **Winthrop NFH**

20. A fishery on adipose fin-clipped steelhead is dependent on meeting a minimum tributary escapement level of natural origin steelhead. The management strategy of the hatchery programs is intended to protect and promote natural reproduction. Combined with protection and restoration of habitat, these actions contribute to the recovery of the steelhead population in the Methow basin.

**Review Team Response:** *The Review Team concluded that the current hatchery management strategy for steelhead in the Methow River may not be consistent with long-term conservation and recovery goals. At the present time, no acclimation and release facilities exist within the Methow*

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*River basin for steelhead reared at Wells Hatchery. Similarly, no facilities exist for collection of adults for broodstock at those tributary locations. WDFW recognizes the need for these latter facilities in their HGMP.*

21. Table 22: What is the basis for estimating the habitat in the Chewuch and Twisp Rivers as low to moderate compared to the habitat in the Methow rating of Medium to High? As suggested in the previous sections, the tables could be combined into one table for the spring Chinook salmon populations.

**Review Team Response:** *The initial habitat ratings in our draft report were largely placeholders based on comanager discussions. We have replaced those initial ratings in our revised report with descriptions from the sub-basin plans of the Northwest Power and Conservation Council.*

22. Page 118 – Facility security is not mentioned as an issue; however adult salmon were stolen from the facility in previous years such that lack of facility security is a risk to the hatchery program.

**Review Team Response:** *Staff at the Winthrop NFH found evidence of poachers in the adult pond during the 2000 broodstock season. In response, adult fish were confined to a more secure area, and the hatchery staff installed security fences around the fish ladder and spawning area. The staff also installed locking gates on the public access side of the facility. However, evidence of poaching continued in 2001 and 2002. The staff installed a motion camera in 2003 and photographed two individuals on the spawning deck trying to enter the pond late at night. The camera flash apparently scared the intruders with no subsequent evidence of poaching that year or in 2004 or 2005. An infra-red camera was installed in 2006 with improved resolution and no visible flash. The infrared camera ran the entire season and recorded no evidence of anyone illegally entering the facility.*

23. NMFS concurs that the Winthrop NFH spring Chinook program as it is currently operated poses domestication and demographic risks to the natural population.

**Review Team Response:** *The Review Team concluded that a new HGMP for the Winthrop NFH and Methow State Hatchery is needed to clarify and distinguish the separate roles of the two facilities. This would be one of the first steps towards an improved management plan for spring Chinook in the Methow River.*

24. Each of the three sections has a footnote that indicates that the Hatchery Evaluation Team is the logical body to implement most of the recommendations. NMFS agrees that many of the recommendation could be implemented by the FWS. However, it is not clear what the time frame for implementation would be. Additionally, many of the alternatives could not be implemented without co-manager participation and no time frame for that work has been identified. When can we expect the changes to be implemented? Will they be implemented when this report is finalized?

**Review Team Response:** *The Service will be meeting with comanagers and joint fisheries partners to develop implementation strategies. Individual actions will have timelines determined by requirements for coordination, design, permitting, consultation, funding and completion of associated or supporting actions. The team expects that many of its operational recommendations will be implemented quite rapidly following completion of the report. Some major facility changes may require five to ten years to complete.*

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25. Conclusions: The transition of the Leavenworth NFH program to local stock would be the result of determining that returning Chiwawa program spring Chinook salmon are surplus to ESA recovery needs. Therefore the conclusion reached in the second paragraph that such a transition cannot occur until all water issue are resolve because of a high risk to the ESA stock may not be correct. The run forecast for the next few years based on the release levels from Chiwawa are likely sufficient to expect Chiwawa hatchery fish will return at levels in excess of recovery needs.

***Review Team Response:*** *The Review Team recommends replacing the water intake pipe at the Leavenworth NFH as a first priority before transition to a new stock for several reasons. These include (a) facility risks to a newly developed broodstock, (b) anticipated complications during the transition if the water supply becomes restricted or unreliable, and (c) loss of manpower investments if a major fish loss occurred after the transition was initiated.*

***Review Team note:*** *NOAA Fisheries also provided the Review Team with many comments and suggestions for clarifying the draft report. These recommendations have been incorporated in the revised report.*

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### U.S. Bureau of Reclamations (BOR)<sup>7</sup>

#### GENERAL COMMENTS

1. We recognize the complexity of the USFWS hatchery review and found that the draft report presents a relatively thorough and comprehensive examination of the programs and associated facilities at the three hatcheries that comprise the Leavenworth National Fish Hatchery complex. It lists existing issues and provides some recommendations that address these issues. It also provides a broad range of alternatives and selected immediate and long-term recommendations for reforming operations and addressing outstanding infrastructure issues for each of the programs.
2. The short-term and long-term recommendations for each facility, derived from the suite of alternatives presented, have merit in relation to achieving mitigation obligations or providing for conservation and recovery of the ESA-listed salmon ESU and steelhead DPS. However, the actual alternatives selected for implementation will need to be based on discussions among the hatchery operators and funding agencies.
3. Related to item 2, Hatchery operators and funding agencies need to know what the range of costs are likely to be associated with program alternatives and recommendations, as this will affect the viability of alternatives and/or the rate in which an alternative(s) can be implemented. It is also important to know the anticipated date for implementation and the length of time the implementation will take for each recommended action/alternative. It is essential that Reclamation be a part of follow up discussions related to alternative selection and implementation.

***Review Team Response to (2) and (3):** The completion of this science-based review and its recommendations are the first steps in the hatchery reform process. Implementation of recommendations, including decisions to proceed with individual measures, will be accomplished through close collaboration among the Service, Bureau of Reclamation, and co-managers. Development of cost estimates and implementation schedules is beyond the scope of this review and will be part of the collaborative implementation process. The Bureau of Reclamation is expected to be a major participant in that process.*

4. In the summary and elsewhere (pages 33, 42, 82, 106, 111), the draft report erroneously lists the authorization for the hatchery complex as the Grand Coulee Fish Maintenance Project of 1937 and the Mitchell Act of 1938. As submitted previously, Reclamation asserts that mitigation for the loss of anadromous salmonid production upstream from the site of Grand Coulee Dam was authorized under the Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Project Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946. We request that this error be corrected wherever referenced in the draft report. Correct characterization of the origin of the hatchery complex is important.

***Review Team Response to (4):** The Review Team has made these corrections in the revised report.*

5. The draft report needs to identify the actions that may require substantial NEPA, ESA, easements, permits, etc. (special considerations).

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<sup>7</sup> Provided by Chris Jansen Lute, BOR Deputy Manager, Pacific Northwest Region

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6. Recommendations should also consider the relationship of the operation of the hatchery programs to other ongoing or completed ESA consultations such as that for the Federal Columbia River Power System, changes or reforms contained in the draft Hatchery and Genetic Management Plans that have been submitted to NOAA Fisheries, and other factors.

***Review Team Response to (5) and (6):*** Identification of necessary regulatory actions will primarily be a part of the implementation process, though the Review Team has considered information which is currently available including existing ESA consultations, HGMPs and Biological Opinions. The Review Team is actively seeking input and guidance from NOAA Fisheries regarding ESA issues during the review process, and they will certainly be an important participant during the implementation process.

7. In addition, the merits of components of other alternatives should be discussed or considered in the context of implementing changes that continue to meet mitigation obligations of the hatcheries and contribute to conservation of ESA-listed salmon and steelhead.
8. Related to item 7, the draft report occasionally mentions the mitigation obligation fulfilled through the Leavenworth NFH complex. This should be emphasized in the report. In proposing alternatives to the current program, for example, the mitigation obligation of the hatchery complex for Grand Coulee Dam should be mentioned. We need to assure that changes to hatchery operations that may provide conservation and address ESA recovery goals, also continue to fully meet Reclamation's Grand Coulee mitigation obligations.

***Review Team Response to (7) and (8):*** The Review Team recognizes that implementation of any alternative to existing programs would first need to undergo a complete comanager review and approval, including legal review to ensure that a new program would meet ongoing mitigation obligations of BOR. The Review Team has assumed mitigation obligations would be met, at least in part, by actions that would provide hatchery-origin salmon or steelhead for harvest or increase the viability of naturally spawning populations in the Columbia River Basin.

9. Reclamation may need to explore whether current authority allows for payment to USFWS for implementation of ESA recovery activities. Speculating, if the selected alternative(s) leads to production of anadromous fish and provides harvest opportunities either locally or downriver (Reclamation's mitigation goal), authority may not be an issue. If the selected alternative(s) deviates from original mitigation goals (for example, leads to extensive monitoring and studies to assure the ESA goals are being reached) our authority to fund such activities may be questioned. As alternatives are further explored it will be important to assure that Reclamation has authority to fund activities.

***Review Team Response to (9):*** The Review Team believes that the Grand Coulee mitigation program lacks clear goals expressed in terms of achieving long-term benefits for conserving salmonid fishery resources. Present programs are being implemented primarily with the intent of producing harvest benefits. Other ongoing hydropower mitigation activities within the basin have addressed a range of management objectives including rebuilding of naturally spawning populations and restoration of aquatic habitat. Decisions to define specific goals for future mitigation activities, or changes in existing mitigation programs, will require the active participation of the Bureau of Reclamation and will involve careful consideration of the scope of funding authorities.

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10. Reclamation is well aware of the deteriorating condition of some of the infrastructure at the Leavenworth Hatchery and has been considering how to rectify the situation, especially the hatchery water supply system.
11. What is the estimated quantity and quality of habitat in Icicle Creek that would be available to anadromous salmonids if passage were provided above the boulder field at RM 5.6?

**Review Team Response to (11):** *Field surveys suggest that approximately 20 miles of Icicle Creek is potentially accessible to anadromous salmonid fishes upstream of the boulder field at RM 5.6. However, the productivity and/or capacity of this reach of Icicle Creek has not yet been quantified or estimated but is believed to be limited. Tributaries to this reach of Icicle Creek have very high gradient and were probably never important nursery areas for anadromous salmonid fishes. In addition, the Icicle-Peshastin Irrigation District maintains its water diversion structure immediately upstream of the boulder field with potential water right withdrawals up to 117 cfs, thus posing another potential impediment to upstream migration of anadromous salmonids at certain times of the year.*

12. The discussion and various references to straying of Leavenworth spring Chinook salmon upstream in the Wenatchee River needs to be clarified. On page 47 the report states that the stray rate is 2.6%, and in other places it indicates a larger stray rate. These should be consistent.

**Review Team Response to (12):** *Approximately 2.6% of all Leavenworth NFH spring Chinook adults returning to the Wenatchee River stray outside of Icicle Creek (i.e. approximately 97% are recaptured in Icicle Creek or at the hatchery). However, the proportion of naturally-spawning spring Chinook composed of fish from the Leavenworth NFH exceeds 30% in some locations because of the relatively small number of natural-origin adults returning to the watershed. We have made these clarifications in the report.*

13. Research, monitoring and evaluation are mentioned without providing much detail or discussion regarding the types or nature of experiments that might be conducted to evaluate the implementation of new programs at the hatcheries, such as the productivity of hatchery-origin fish from a conservation program spawning in the wild, productivity of wild by hatchery-origin fish spawning in the wild, etc.

**Review Team Response to (13):** *Research, monitoring, and evaluation (RM&E) are necessary to assess whether hatchery programs are achieving their goals. Protocols and methods regarding R,M&E for new hatchery programs will be developed as part of the overall planning process for comanager-approved programs during the feasibility and implementation phase.*

14. Reclamation would like to know more about the decision to provide adult salmon broodstock surplus to Columbia River tribes, food banks, and Trout Unlimited.

**Review Team Response to (14):** *The request for more information on this process has been referred to the complex manager. In general, the Service follows the legal guidance of the U.S. Solicitor's Office in the process which it uses to offer surplus food quality fish from its hatcheries to Native American tribes and other entities. The Service also consults closely with co-managers in determining whether returning fish are surplus to fishery management needs.*

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15. The draft review report needs to include references; many sweeping statements are made without citation.

**Review Team Response to (15):** *We have included our briefing document (Appendix B) with the revised report. This latter document summarizes, with references, the key background information used by the Review Team for its assessments and recommendations. Specific citations are noted in footnotes.*

16. Regarding recommendation LE3, describing potential thermal effects on spring Chinook salmon entering Icicle Creek, this recommendation suggests investigating the possibility of selective breeding for early return timing to further segregate the hatchery stock from the upriver natural stocks. We feel that this is not a wise recommendation since even though it is a hatchery stock it risks the loss of genetic diversity and the opportunity to use this stock as a potential “backup” stock for the Wenatchee and mid-Columbia, as mentioned in the second bullet statement under Conservation Benefits on page 38. Also, in relation to water temperature in Icicle Creek, what about the use of the cooler water from Snow and Nada lakes?

**Review Team Response:** *Some level of artificial selection may already be occurring if the latter part of the spring Chinook run back to the hatchery is thermally diverted from Icicle Creek. Although we are not a proponent of selective breeding of segregated hatchery stocks, we suggested that this could be one mechanism for reducing genetic risks to natural populations, particularly if physical separation at Tumwater Dam is difficult to implement. We do favor selective removal of Leavenworth NFH spring Chinook at Tumwater Dam and transitioning to an endemic Wenatchee River stock over selective breeding of the existing stock. With respect to use of cooler water from Snow and Nada lakes, see our response to Comment No. 7 of NOAA Fisheries.*

17. Alternative 6 for the Leavenworth NFH (Integrated coho restoration and harvest program) notes that coho salmon was not considered a “mitigation” species for Grand Coulee Dam. We question if this is really a problem in the broad scope of mitigation for Grand Coulee. Same comment for Alternative 6 for Winthrop NFH.

**Review Team Response:** *The Review Team concurs with this assessment by BOR. Although coho salmon were largely extirpated from the mid-upper Columbia River prior to the construction of Grand Coulee Dam, they were historically an important component of the anadromous salmonid ecosystems of the region. Reintroduction of coho to the Wenatchee and Methow rivers, as proposed in the Master Plan of the Yakama Nation, could be an important source of marine-derived nutrients for spring Chinook and steelhead. We understand that BOR is fully committed to meeting its mitigation responsibilities, where mitigation is broadly defined.,*

**Review Team Note:** *BOR provided the Review Team with many specific comments and suggestions for clarifying the draft report. These specific recommendations have been incorporated in the revised report.*



## USFWS Columbia Basin Hatchery Review Team

*Leavenworth NFH Complex Assessments and Recommendations Report – April 2007*

### US Fish & Wildlife Service Ecological Services<sup>8</sup>

1. Leavenworth NFH. The team's recommendation for a holistic solution for both hatchery water supply and fish passage is warranted. However, devising this sort of solution is typically time-consuming. That might run counter to the recommendation to replace the water intake system ASAP. To what degree do choices about the intake system constrain options available for holistic solutions?

**Review Team Response:** *The Review Team acknowledges that a holistic solution regarding infrastructure changes related to water conveyance and fish passage may take some time. However, the Review Team agreed that - in the long view - a holistic approach would be more efficient and possibly less expensive than implementing infrastructure changes in a "less comprehensive piecemeal fashion." However, in the short (immediate) term, the pipeline needs to be replaced. By all estimates, the structure could fail at any time. We realize that repair/replacement now might be redundant within a more integrated approach to other infrastructure changes in the future. Replacing the existing intake pipeline does not directly address related issues (e.g. instream flows, existing legal over-appropriation of Icicle Creek water during the summer, fish passage, etc.) On the other hand, we feel the Service should not risk major fish losses if a holistic solution cannot be identified and implemented in the immediate future.*

2. Entiat NFH. I am confused why the description about the benefit of the ENFH fishery differed from LNFH. I realize there is no fishery at the former, and the tribal fishery is unique to the latter, but both hatcheries raise the same unlisted stock, so potentially shouldn't (or couldn't) they be similar?

**Review Team Response:** *The Entiat River is currently closed to all fishing for spring Chinook because harvest on hatchery fish would incidentally harvest endangered natural origin spring Chinook migrating up the Entiat River. Icicle Creek is open to sport and tribal fishing for spring Chinook because little or no incidental harvest occurs on wild fish migrating upstream in the mainstem Wenatchee River. All stocks of spring Chinook (hatchery and wild) are susceptible to harvest in the mainstem Columbia River when it is open to fishing for spring Chinook; however, harvest rates in the mainstem Columbia River are substantially less than the rates that can occur in tributaries (e.g. Entiat River).*

3. Entiat NFH. The Ecological Services disagrees that (paraphrase) "a weir is necessary to monitor the bull trout population in the Entiat basin". There are other ways to monitor bull trout, such as the radio-telemetry and redd surveys that are already underway. The proposed trap will benefit hatchery management goals, but it may harm bull trout. At best, traps require handling bull trout and delaying their migration. Sometimes bull trout will avoid a trap entirely.

**Review Team Response:** *Our initial draft recommendation for Entiat NFH was to develop a summer Chinook program as a replacement for the existing spring Chinook program. A weir would be highly desirable, perhaps necessary, to trap adults for broodstock and preclude (or control) hatchery-origin fish upstream of the hatchery. Under our current, finalized recommendations, adult fish would not be trapped nor juvenile fish released at Entiat NFH; hence, a weir would not necessarily be desired or required for the hatchery. However, comanagers have expressed a desire to use the Entiat River as a no-hatchery "reference stream"*

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<sup>8</sup> Provided by David Morgan, U.S. Fish and Wildlife Service (Ecological Services), Wenatchee, Washington.

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*for assessing recovery efforts for steelhead and spring Chinook in the Wenatchee and Methow Rivers. For those two species, particularly steelhead, a weir and adult bypass-handling facility would facilitate biological assessments of natural productivity and other biological parameters. Similar needs may not exist for bull trout*

4. Leavenworth NFH. The Review Team refers to natural origin spring Chinook in Icicle Creek which enter the hatchery, and the transportation and release of these fish above LNFH. I am not aware of this occurring in recent memory.
5. **Review Team Response:** *Unmarked spring Chinook rarely enter the adult holding pond. If and when it occurs, they will be incorporated into the broodstock because they would most likely be (a) hatchery fish that escaped marking prior to release or (b) natural-origin progeny of hatchery fish that successfully spawned in Icicle Creek. We have corrected our report accordingly*
6. Leavenworth NFH. The social and economic benefits to the community at large could still exist regardless of the alternative chosen. Public outreach, education, skiing, theatre, festivals, etc. are not necessarily dependent on the alternative chosen.

**Review Team Response:** *Our FWS reviews of NFHs purposefully avoid assessments of economic benefits beyond citations of existing evaluations, but we do note social-cultural-education benefits to local communities and tribes.*

7. Leavenworth NFH. There was a reference to modifying the boulder area near Snow Creek to facilitate upstream passage. Based on observations of migratory-sized bull trout upstream from this location, this is probably not necessary, at least for this species. Once passage is provided in lower Icicle, I suggest we wait several years and see what happens before considering this.

**Review Team response:** *The Review Team concluded that the boulder field upstream from the hatchery intake is impassible to Chinook salmon but potentially passable to bull trout and steelhead. We also heard unconfirmed accounts that the gradient of the boulder field increased when the Icicle Creek Road was constructed decades ago.*

**Review Team note:** *US Fish & Wildlife Service Ecological Services provided the Review Team with many specific comments and suggestions for clarifying the draft report. These specific recommendations have been followed in the revised report.*

## *Stakeholder Comments and Responses*

### **Stakeholder Forum<sup>9</sup>**

#### LEAVENWORTH NFH

##### ***Regarding the use and harvest of a listed species (LNFH spring Chinook)***

1. Has the Service started the process for permitting with NOAA regarding program recommendations that involve harvesting listed species (i.e. spring Chinook)?

***Review Team Response:*** *The Review Team review process is the first step toward those discussions. The Service will have to go through the formal NOAA Fisheries permitting process before recommendations can be realized (see NOAA Fisheries comment #14). The Review Team has shared their ideas with NOAA Fisheries, and NOAA has incorporated some of these ideas in the ongoing Columbia River remand process to develop measures for a new mainstem Biological Opinion. -- Additionally, the Review Team has received generally supportive responses from NOAA Fisheries personnel after outlining the proposed stepping stone model for Leavenworth spring Chinook in informal conversations.*

2. The recommended Leavenworth spring Chinook program is different from other programs dealing with ESA-listed stocks because the primary purpose of the program will be harvest. Therefore, the Service must get their ducks in a row regarding benefits and risks before going to NOAA.

***Review Team Response:*** *Yes, we agree. The Review Team believes that the increased conservation benefits and reduced risks associated with transitioning to a new broodstock, as outlined in our Alternative 3, are consistent with comanager goals and should permit a continued terminal fishery in Icicle Creek.*

3. However, don't the fish rely on the hatchery as an artificial refuge?

***Review Team Response:*** *Yes. The recommended "stepping stone" broodstock program reduces extinction risks in the near term by providing both demographic and genetic buffers to inter-annual variations in abundance. This near-term conservation benefit will continue to occur until the productivity and capacity of the habitats in the Wenatchee River (and elsewhere) are sufficient to maintain self-sustaining, and viable, wild populations.*

4. If something [catastrophic] were to happen in the upper [Wenatchee River] basin, then we would be out one brood year of wild fish. The integrated hatchery program would help with this issue.

***Review Team Response:*** *Yes. A new "endemic" broodstock at Leavenworth NFH could potentially provides a safe haven or insurance policy against potential catastrophic events in the*

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<sup>9</sup> These comments were provided by attendees of Stakeholder Forums held at the Coast Wenatchee Conference Center in Wenatchee, Washington and Amy's Manor in Pateros, Washington on October 16 and 17, 2006. Responses were provided by Review Team members who attended the meeting and were clarified in subsequent Review Team meetings.

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*upper Wenatchee River. Additionally, the only substantial harvest benefit in the region currently is from spring Chinook propagated at Leavenworth NFH. Because of this, that benefit should be protected.*

#### **Water consumption, fish passage, facility improvements**

5. We would like to see Leavenworth NFH become a non-consumptive user of water (i.e. not dewatering any part of Icicle Creek).

**Review Team Response:** *The Review Team report identifies issues associated with the location of the Leavenworth NFH intake and outfall and their impacts on Icicle Creek. The team also noted that Leavenworth NFH is not the only withdrawer of water from Icicle Creek. Taking a larger view, the Team thought that much discussion is possible among all the water withdrawers to take a more holistic approach to the instream flow problem and related issues.*

6. Has the Review Team taken into account global warming? There are concerns about long-term risk associated with this issue. Are there plans that take into account the potential for reduced water availability and higher water temperatures in 20-50 years?

**Review Team Response:** *The Review Team did not consult with climatologists or review the output of climatological models to understand potential changes in water availability over the next 50 years. We did note, though, that Icicle Creek water is currently over-appropriated during the summer months and that long-term, collaborative solutions are necessary.*

7. Is there a concern about the potential for disease if intake water for the hatchery is pumped from below the bypass canal spillway as a replacement for failing intake water pipe?

**Review Team Response:** *Yes. We specifically recommended the development of a long-term plan to address the future need to disinfect Icicle Creek water provided to the hatchery for fish culture (Recommendation LE7c). We further concluded that this need is independent of the future location or type of intake structure constructed.*

8. We would like to see a more efficient system developed to replenish the well fields at Leavenworth NFH rather than relying on diversion of Icicle Creek water through the bypass canal

**Review Team Response:** *The Review Team agrees that the well field recharge process is not well understood and that the current replenishment process may be inefficient. However, Appendix L of the Final Environmental Impact Statement for Icicle Creek<sup>10</sup> provides the results of simulation modeling showing that diverting Icicle Creek water through the bypass canal can increase the pressure head in the hatchery wells by approximately 1.5 to 4 feet depending on recharge conditions. Nevertheless, we agree that the Service should work on this issue and determine whether improvements can be made. Diverting water through the bypass canal and recharging the hatchery wells are components of the overall water issues on Icicle Creek. The bypass canal also protects lower Icicle Creek from flooding. Consequently, under present conditions, the Review Team recommended continued use of the bypass canal.*

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<sup>10</sup> U.S. Fish and Wildlife Service. 2002. Icicle Creek Restoration Project, Final Environmental Impact Statement. U.S. Fish and Wildlife Service, 911 N.E. 11<sup>th</sup> Avenue, Portland, Oregon 97232-4181.

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9. We also suggest improved screening is needed at the water intake. Also, if Leavenworth NFH is going to continue to use a gravity feed water intake system at its present location, then the FWS should take a close look at a good fish ladder over the water diversion dam.

**Review Team Response:** *The Review Team has touched on these issues in the report and the need to prevent entrainment of fish in the intake system. Whatever mix of solutions is chosen, all the pieces must fit together so that they operate as a whole. For example, it may be straightforward to replace an old water pipe; however, that single-purpose solution doesn't address other problems that could be addressed through a more holistic approach. In a nutshell, the Review Team attempted to integrate fish passage, water withdrawals, and instream flow issues and make a holistic recommendation based on an integrated review.*

#### **Other issues**

10. There was concern about the logistics of ramping down the existing Leavenworth Hatchery spring Chinook program while starting the stepping stone program with a broodstock such as spring Chinook from the Chiwawa River.

**Review Team Response:** *There are two issues. First, the Review Team felt that the water intake system for the hatchery should be replaced before the transition to a new broodstock is initiated. Second, uncertainties exist regarding the number of Chiwawa River hatchery fish available in a given year, including uncertainties regarding the survival and return rate of their progeny at Leavenworth NFH relative to the current Leavenworth stock. The scientifically-defensible approach would be to spawn and release equal numbers of both groups of fish for one full salmon generation (5 years) to assess their relative performances. Such a "side-by-side" evaluation creates logistic difficulties for the hatchery and further increases the time lag for potential full implementation. Alternatively, a smaller-scale study could be conducted comparing the survival and return rate of both stocks of fish reared at Leavenworth NFH and released into Icicle Creek (Recommendation LE1c). Such a study could be initiated, at some risk, before replacement of the water intake system. The Review Team also recommends reducing the number of spawned Leavenworth NFH spring Chinook and differentially marking or tagging their progeny so that they strays can be removed at Tumwater Dam to reduce risks to endangered spring Chinook in the upper Wenatchee River.*

11. If there were a harvest opportunity to get hatchery fish off spawning grounds, would collecting Chiwawa broodstock at Tumwater Dam preclude the opportunity for the harvest of spring Chinook in the Chiwawa River?

**Stakeholder Response:** *I don't think it could happen because once the fish reach Tumwater Dam, they are out of the fishery. A fishery below Tumwater Dam could potentially exist but would have to be closely monitored so that broodstock are fulfilled and wild fish are not harvested.*

**Review Team response:** *We are unable to answer that question at this time. Currently no harvest is allowed for the listed Chiwawa stock and future decisions will be based on further analysis. Based on the current conservation status for the species, we anticipate harvest of Chiwawa stock in the Chiwawa River or elsewhere upstream of Tumwater Dam is not likely to be viable in the foreseeable future.*

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#### ENTIAT NFH

12. Summer Chinook are released from hatcheries as both subyearlings and yearlings. From a harvest perspective, yearling summer Chinook produce a much higher return to harvest than subyearlings. Additionally, WDFW does not recognize summer Chinook in the Entiat River as a population in their SASSI report<sup>11</sup>.

**Review Team Response:** *When making their initial recommendations regarding a potential summer Chinook program at Entiat NFH, the Review Team presumed it would take a lot more information and discussions among the co-managers to work out the specific details regarding the make-up and release strategies of the program. The normal life history of summer Chinook in the mid-Columbia region is to smolt and outmigrate as subyearlings. In this geographic region, “summer Chinook” are an early-returning fall Chinook (i.e., an “ocean-type” Chinook). However, releasing summer Chinook as a yearling does, indeed, confer a major survival advantage, presumably due to increased ability to avoid predation in mainstem reservoirs and survive downstream passage through the dams. Releasing summer Chinook as subyearlings vs. yearlings thus creates biological and logistic tradeoffs in both directions. Another uncertainty is whether summer Chinook are native to the Entiat River. At the present time, approximately one-third of all summer Chinook spawning in the Entiat River are strays from mainstem hatchery programs (e.g. Turtle Rock releases). All of these factors would need to be considered in any decision to implement a summer Chinook program at Entiat NFH.*

**Review Team note:** *In response to comanager and stakeholder written comments, the Review Team withdrew its initial draft recommendation for a summer Chinook program at the Entiat NFH. Although it was envisioned as the only program that could legitimately support a terminal fishery for salmon or steelhead in the Entiat River at this time, neither the comanagers nor stakeholders expressed much support for that option.*

13. Did the Review Team assess the limitations to coho restoration on the Entiat River and other up-river areas?

**Review Team Response:** *No. We did not specifically address that question in our review. In this context, we defer to the coho Master Plan of the Yakama Nation. The Review Team was advised by comanagers that the Entiat River has limited available habitat suitable for coho and is thus not as high a priority for coho restoration as the Wenatchee and Methow Rivers at this time.*

#### WINTHROP NFH

14. Will the stepping stone brood (for spring Chinook) be analogous to the LNFH spring Chinook alternative? Will it primarily be a “for harvest” program?

**Review Team Response:** *Yes and maybe. The Review Team envisions many parallels between an updated spring Chinook program at Winthrop NFH and the proposed new broodstock program at Leavenworth NFH. The two federal hatcheries would not include wild fish in their broodstocks but would work closely with state hatchery programs to meet harvest needs in the Methow and*

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<sup>11</sup> Salmon and Steelhead Stock Inventory

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Wenatchee rivers, respectively. We also envision an additional role of the Winthrop NFH to assist with reintroduction of spring Chinook to the Okanogan River and possible establishment of a new hatchery program at the base of Chief Joseph Dam to support terminal fisheries

15. For the proposed steelhead program, was the vision to collect steelhead at Foghorn Dam?

**Review Team Response:** Yes. The Review Team saw biological conflicts associated with collecting adults, both hatchery and wild, for broodstock at Wells Dam. WDFW has recognized similar conflicts in their HGMPs. The proposed facility at Foghorn Dam (or other suitable site) would be both for controlling upstream passage of hatchery-origin fish and collecting natural-origin fish for broodstock. We envision that collecting adults returning to the Winthrop NFH would be sufficient to meet the hatchery component of the broodstock in most years. Part of the program transition would be that Winthrop NFH progeny would be the only hatchery origin fish allowed upstream of Foghorn Dam. The Review Team anticipates that this approach would create a locally adapted population that WDFW could utilize as broodstock for their programs in the future.

16. If we have a collection facility on the Methow River, would it eliminate the need for collection of broodstock at Wells Dam altogether?

**Review Team Response:** The Review Team anticipates that the collection of broodstock on the Twisp and Chewuch rivers could eliminate the need for collecting broodstock at Wells Dam in most years. However, in low return years, spring Chinook have been collected for broodstock at Wells Dam as a conservation measure.

#### GENERAL

17. Please clarify the Review Team recommendations related to the support of the Yakama Nation's coho reintroduction program.

**Review Team Response:** In some cases, the Review Team considered rearing and releasing coho as one potential alternative to existing Service programs, but we never recommended that the existing coho programs be changed. However, the Review Team continues to support the coho reintroduction program. The Review Team stands behind the aggressive approach of the coho reintroduction program and commends its ongoing success. The Review Team further recommends that the Service continue to support the reintroduction program "to the extent the USFWS facilities are able."

18. What has happened to the nutrient levels in the local rivers since nutrient enhancement [via planting of salmon carcasses] has been discontinued in the region? Nutrification is an important component to restoration in the region. However, no nutrient studies are going on and there are no established nutrient-level baselines for the rivers. Historically, returning salmon constituted a large component of the region's nutrient base. In Canada, nutrient enhancement has been very productive.

**Review Team Response:** The Review Team agrees that these are relatively nutrient poor systems. This has driven some of the team's thinking. The team concluded that natural populations will never be as large in this region as other regions because of these nutrient issues. However, the

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*team felt that harvest supplementation programs could work in harmony without adversely affecting wild populations. The Yakama Nation's coho reintroduction program may also help increase nutrient loadings in areas where adult coho spawn and die.*

19. Hatchery strategies should be targeted at maximizing the diversity of habitats used by salmon. Steelhead and spring Chinook are found spawning way up in small streams. This habitat should be supported because spawning success may be high in these regions. In conjunction, it is appreciated that the Review Team is trying to move broodstock collection upstream from Wells Dam in tributaries where fish spawn.

**Review Team Response:** *The Review Team thinks there is an opportunity for outplanting adults and juveniles into those smaller basin streams to help reestablish naturally spawning populations. However, integrated programs are limited by the size of the natural population, and the Review Team is concerned about the maximum potential size of the natural population due to habitat limitations.*

20. We would like to see funding for areas where habitat can be improved (e.g., removing blockages, improving culverts, opening elbows, etc.). Many of these things should be done in the Methow system and likely need to be done throughout the mid-Columbia region.

**Review Team Response:** *There are several programs that fund fish passage and habitat restoration projects both within the Service and through other funding sources including Bonneville Power Authority and local watershed efforts. Because of the large opportunity for restoration actions, it will take substantial time to sufficiently fund all worthy projects.*

21. Will habitat be made available above the water diversion dam and boulder field on Icicle Creek.

**Review Team Response:** *See Review Team response to Comment #7 from our Fish and Wildlife Service Ecological Services office. At the present time, the Service is looking at resolving passage constraints downstream of the boulder field only.*

22. Is there money going toward passage improvements on dams (such as trapping facilities)?

**Review Team Response:** *The Service is working with the Bureau of Reclamation to prioritize a large maintenance and construction backlog for the Leavenworth NFH complex that includes fish passage among other needs. Foghorn Dam improvements are not currently on the backlog list but will be appropriate for consideration to implement hatchery reform recommendations. There may also be an opportunity for cost sharing with other mitigation programs including those at Methow State Hatchery*

23. Foghorn Dam has never functioned as a trap because fish easily get past the dam. There is comanager interest in having trapping facilities in the tributaries (e.g. at Foghorn). The Review Team report may lead to discussions with the PUD on how to accomplish this.

24. What about the use of remote site incubators (RSIs) to seed tributary reaches?

**Review Team Response:** *Fingerling plants would have a similar effect. The drawback is that the survival rates are relatively low. On the other hand, RSIs have been successful in some west side tributaries where natural populations had been extirpated.*



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25. Did the Review Team consider what the Service would do if BPA pulled their support for the Yakama coho reintroduction program?

**Review Team Response:** *This question is in reference to the Northwest Power and Conservation Council's recent review of fisheries projects. BPA funding for the Yakama Nation's coho reintroduction project may be reduced. The Review Team concluded that coho reintroduction should continue; however, the Service wouldn't be able to financially support the program if BPA funding were discontinued. Options for supporting possible funding through the Grand Coulee mitigation program could be appropriate to pursue if funding reductions from BPA were to occur. However, tribal support for continued BPA funding is very strong.*

26. Was there talk regarding initiating hatchery programs for supplementing natural populations of bull trout?

**Review Team Response:** *The Lower Columbia River Recovery Team suggests investigating the feasibility of hatchery supplementation for bull trout recovery. However, the rationale for artificial propagation is different for bull trout than salmon and steelhead due to mitigation and fishery obligations. In addition, the current "threatened" status of bull trout and limited supplementation needs for this species may not rise to the same level of priority for hatchery conservation programs as species listed as endangered (e.g., spring Chinook). The potential use of artificial propagation for reintroduction of bull trout into areas where they have been extirpated might be one future option, and is under consideration in the Clackamas River Basin in Oregon.*

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### Entiat Watershed Planning Unit

1. From a technical standpoint, the timing of a terminal late-run [summer] Chinook fishery, were it to occur, would likely result in the lowest potential for incidental take of ESA-listed spring Chinook, steelhead and bull trout ... [However,] There is strong community concern that the switch to late-run Chinook will not provide a meaningful terminal fishery on the Entiat River. Landowner support of USFWS Alternative 3 is tied to its potential harvest benefits. In past fisheries management discussions WDFW staff noted that, based on their life-history strategy, late-run Chinook are difficult to catch once they enter the tributaries. In addition, a “Con” listed for Alternative 3 is that the “...majority of harvest would occur outside the Columbia River basin because nearly two-thirds of hatchery-origin summer Chinook from the mid-Columbia Region are currently harvested in Alaska and Canada commercial fisheries” (USFWS, draft October 2006).

**Review Team Response:** *In view of this comment from the Entiat Watershed Planning Unit and similar comments from other stakeholders and the fishery comanagers, the Review Team withdrew its recommendation for a summer Chinook program as a replacement for the existing spring Chinook program at the Entiat NFH. The Review Team concluded that the best use of the Entiat NFH at the present time is to serve as a conservation facility for upriver stocks, including reintroduction programs for coho and spring Chinook.*

2. Of all 4 Hs – Hatchery, Hydro, Habitat and Harvest – there is least certainty around or information about the issue of commercial fisheries and harvest levels, and their relationship to upper Columbia River fisheries and harvest opportunities. In Appendix A, there is a summary of All-H Analyzer (AHA) output for salmon and steelhead stocks in the mid-Columbia Region. The EWPU would like USFWS and/or other appropriate staff to share information about the AHA model, its inputs and assumptions, and modeling results at an upcoming quarterly EWPU meeting to facilitate communication about how the effects of out-of-subbasin effects are being evaluated by the co-managers and recovery planners.

**Review Team Response:** *The AHA spreadsheet model was developed by the Hatchery Scientific Review Group (HSRG) in western Washington as a hatchery planning tool to address short-term and long-term goals related to the four “H’s”. It was not intended to be a harvest, habitat, or recovery planning tool, although the spreadsheet attempts to account for future assumed conditions in the non-hatchery “H’s”. On the other hand, the Interior Columbia Technical Review Team (ICTRT) has adopted the AHA tool as a way to quantify future recovery planning efforts. Members of the Review Team and the HSRG are available to discuss the AHA model as a hatchery planning tool as it relates specifically to quantifying our understanding of the four H’s in the Wenatchee, Entiat, and Methow Rivers (contact the Chair of the Review Team or HSRG). Members of the ICTRT would probably be more appropriate persons for dealing directly with recovery planning and their use of the AHA spreadsheet model.*

3. It is noted that a switch to late-run [summer]Chinook may involve construction of a weir. The EWPU would like more information about how hatchery weirs operate, their functional and research benefits, and where/how a weir in the Entiat might operate. In addition, the EWPU requests that future discussions that may occur about placement of a weir be coordinated with the Planning Unit to assure good discussion and communication about the issue.

**Review Team Response:** *Current review recommendations do not identify a need for a management weir at Entiat. (See also our response to Comment #3 from the FWS Ecological Services office.)*

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4. The USFWS collects genetic samples from spring Chinook that return to spawn in the Entiat subbasin. Some analysis has been performed (Ford et al 2004); however the number of samples that were analyzed was deemed too small and from too few generations to provide significant information about the genetic composition and similarity of naturally-reproducing spring Chinook to hatchery origin spring Chinook in the Entiat. The Planning Unit recommends the USFWS continue to collect genetics samples as well as provide adequate resources for the analysis and publication of the findings.

**Review Team Response:** *The Review Team concurs with the need for long-term genetic monitoring of natural populations. The genetic results of Ford et al. (2004)<sup>12</sup> are consistent with the hypothesis that Entiat NFH spring Chinook have successfully spawned in the Entiat River. Future monitoring will allow rates of future genetic divergence between the Entiat River population and other populations to be estimated if our recommendation to terminate the current hatchery program is implemented.*

5. Implementing Alternative 4: Conservation facility for upriver stocks was the USFWS' secondary recommendation. It would involve using the ENFH for propagation of Upper Columbia River basin species of high conservation or harvest concern, including – but not limited to – reintroduction of spring Chinook to the upper [mainstem] Columbia and Okanogan Rivers. While this Alternative could help with the restoration and recovery of spring Chinook in the mid and upper Columbia Region, and would accrue additional tribal and recreational harvest benefits to the mainstem Columbia River, it falls short of meeting USFWS and community goal of a terminal harvest opportunity in the Entiat River.

**Review Team Response:** *Our initial recommendation to develop a summer Chinook program at Entiat NFH was largely motivated by the desire to expand terminal fishing opportunities in the Entiat River. At the present time, the Entiat River between the mouth and Entiat Falls is only open to fishing for mountain whitefish (from December 1 through March 31). Unfortunately, terminal fishery options in the Entiat River at other times of the year are limited because of the ESA status of spring Chinook and steelhead.*

6. The USFWS draft document also describes the current role of the ENFH in supporting the Yakama Nation's Master Plan with respect to Coho reintroduction, and how it may also be managed to assist with LNFH production. The EWPU asks that USFWS staff make a presentation to the Planning Unit about the ENFH and its operational mandates and goals, its role as part of the Leavenworth Complex, and how ENFH management decisions fit within larger co-manager goals and discussions.

**Review Team Response:** *We have forwarded this request to the manager of the Entiat National Fish Hatchery.*

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<sup>12</sup> Listed as document ET-006 on our hatchery review website

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### Trout Unlimited<sup>13</sup>

1. The various alternatives were gauged based on how well they met the stated goals and not whether the goals were in fact a good fit for the watershed and the recovery needs of the species – This is one of the main areas of difference in Trout Unlimited’s recommendations.

**Review Team Response:** *We conducted face-to-face meetings with representatives of the Colville Confederated Tribes, Yakama Nation, Washington Department of Fish and Wildlife, and the National Marine Fisheries Service to understand their collective and separate goals for salmon and steelhead resources in the mid and upper Columbia River regions. We also solicited the input from the U.S. Bureau of Reclamation. Recovery of the Upper Columbia Spring Chinook ESU is a top priority for all comanagers, both from a conservation perspective and from a future harvest perspective. The Review Team believes transitioning to a Wenatchee River broodstock at the Leavenworth NFH, terminating the existing out-of-basin spring Chinook program at the Entiat NFH, and clarifying the conservation and harvest roles of the Winthrop NFH are consistent with the goals established by the comanaging agencies and tribes.*

2. A quick summary of the LHC Assessment reveals that in the five main watersheds of the Upper Columbia River system, there are 16 hatchery programs, 236 raceways (at a conservative estimated average length of 50 feet each, this is over 2 miles of raceways), 141 ponds, 185 tanks and at least 8 incubation centers. Despite the 23 million salmon released from these programs (Huntington, 2006), the USFWS concluded that only the spring Chinook program at the Leavenworth facility is providing fishery (harvest) benefits.

**Review Team Response:** *Our conclusions regarding fishery benefits refer only to the Leavenworth, Entiat, and Winthrop NFHs. They do not refer to facilities operated by the Washington Department of Fish and Wildlife (WDFW) or the tribes. For example, summer Chinook programs operated by WDFW in the mid-Columbia region make very significant contributions to commercial and recreational fisheries in Alaska, British Columbia, the Washington coast, and lower Columbia River.*

3. Most of the existing hatchery programs in the Columbia Cascade Province are best categorized as experimental, and those intended to prevent near-term extinctions of at-risk populations appear to threaten longer-term prospects for these populations to sustain themselves without artificial support.

**Review Team Response:** *We agree with TU’s comment regarding “experimental” for hatchery programs designed to recover imperiled populations. However, we do not believe that conventional hatchery programs, designed explicitly to provide harvest benefits (e.g. Leavenworth NFH spring Chinook), can be classified as “experimental.” Hatcheries have a strong track record of providing fish for harvest.*

### Preliminary Recommendations for Leavenworth NFH

4. Given the high quality habitat above Tumwater Dam, those streams should be maintained as wild-salmon reserves to the greatest extent possible (i.e. no new programs such as the White River and

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<sup>13</sup> Provided by Kaitlin Lovell, November 20, 2006.

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Nason Creek programs and the existing program on the Chiwawa should be terminated as soon as the conservation objectives are met).

**Review Team Response:** *Those programs were not the subject of our review. Upper Wenatchee spring Chinook supplementation using captive broodstock techniques and conventional hatchery methods has been addressed in NMFS ESA consultations and the Team expects that this issue will receive further attention in the ongoing recovery planning process for the upper Columbia River.*

5. We note that one of the best conservation roles for Leavenworth NFH, given its location and facilities, would probably be to provide adult handling, egg incubation, and progressive rearing support to tightly managed conservation hatchery programs in the Wenatchee subbasin.

**Review Team Response:** *The location of the Leavenworth NFH on Icicle Creek allows an intensive tribal and recreational fishery to occur on hatchery-origin spring Chinook with little or no incidental harvest impact on ESA-listed spring Chinook in the Wenatchee River basin. As we note in our review, we believe this harvest benefit should be preserved as a high priority. Transitioning to a “within-basin” broodstock at the Leavenworth NFH is intended to confer a long-term conservation benefit by substantially increasing the total number of returning adult fish representing the Upper Columbia Spring Chinook ESU, but without reducing harvest benefits in Icicle Creek.*

#### **Preliminary recommendations for Entiat NFH**

6. Develop a weir and improved fish trapping/sorting facility [on the Entiat River] so that stray adults can be excluded and the subbasin’s fish populations can be studied.

**Review Team Response:** *In our revised final report, the Review Team is recommending replacement of the existing spring Chinook program at the Entiat NFH with recovery and reintroduction programs for species of high conservation or harvest concern (e.g. spring Chinook, coho salmon). These latter programs, as envisioned by the Review Team, would not include direct releases of juveniles or trapping of adults in the Entiat River. Consequently, a weir and fish sorting facility would most likely need to be justified on the basis of research and monitoring priorities, if our recommendation is implemented.*

7. Integrated summer Chinook programs are already common in the Province and the Entiat is the only sizeable subbasin without one. There are already numerous summer Chinook programs that maintain escapement levels and harvest rates. We are not convinced that another summer Chinook program is needed and are concerned that added more programs will drive the summer Chinook populations closer to a listing under the ESA.

**Review Team Response:** *In our final report, we have withdrawn our earlier recommendation to develop an integrated summer Chinook program at the Entiat NFH in response to comanager and stakeholder comments on our draft report (see also our response to comment #6).*

#### **Preliminary Recommendations for Winthrop NFH**

8. For spring Chinook, TU would like to obtain clear assurances that the integrated Methow spring Chinook program is not permanent and to establish binding triggers for disconnecting the hatchery program(s) from the natural population(s) if/when the Methow’s natural population is large. It

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would be best if the Winthrop NFH took full responsibility for one of the three major branches of the Methow spring Chinook population. Because of the endangered status of spring Chinook in the Methow, these fish would not be available for harvest in any circumstances.

**Review Team Response:** *As we note in our recommendations, a detailed management and recovery plan for spring Chinook in the Methow River basin needs to be developed. This plan should clarify the relative roles and responsibilities of the Methow State Hatchery and Winthrop NFH. This plan could also provide recovery benchmarks or “triggers” for discontinuing hatchery releases intended to contribute to natural reproduction.*

### ***Specific Comments and Responses to the LCH Assessment***

9. Notably missing from the *biological significance* category is a sub category on *recovery significance*. As indicated in the description, the biological significance may be different (and lower) than the recovery significance. While it is vitally important to maintain and track the biological significance, it is equally important to meter management objectives and programs to the recovery significant.

**Review Team Response:** *We have modified our stock tables for each watershed to include the recovery criteria and significance of each ESA listed population as described in the “Proposed Upper Columbia Spring Chinook Salmon, Steelhead, and Bull Trout Recovery Plan, June 2006 ([http://okanogancounty.org/planning/salmon\\_recovery.htm](http://okanogancounty.org/planning/salmon_recovery.htm)).*

10. The harvest description must include a delineation of the impact of harvest on hatchery and wild origin fish. There is a significant incidental impact from harvest on listed wild fish returning to this region.

**Review Team Response:** *Harvest impacts associated specifically with the Leavenworth, Entiat, and Winthrop NFHs are summarized in our Benefit-Risk assessments. Those assessments are based on the information summarized in Appendix B of our report and the many supporting documents ([www.fws.gov/pacific/fisheries/hatcheryreview.htm](http://www.fws.gov/pacific/fisheries/hatcheryreview.htm)). Those assessments do not include the benefits or risks of state or tribal hatchery programs.*

11. Trout Unlimited is particularly disturbed by the poorly veiled attempt in this Assessment to seemingly make every fish available for harvest, going as far as suggesting a special permit from NOAA Fisheries to take ESA listed endangered fish in new fisheries (e.g. pg.58, 62), and in other areas possibly designate as “experimental” other populations geared towards recovery so that “excess” fish may be harvested. We believe that both of these approaches are highly illegal under the ESA and irresponsible. ... Instead, some of the proposed alternatives attempt to solve the question “how do we use wild fish to keep the hatchery going?” instead of “how do we use the hatchery to keep the wild fish going?” etc.

**Review Team Response:** *Neither of our recommended alternatives for spring Chinook at Leavenworth or Winthrop NFHs would include wild fish in the broodstock. Instead, they would include surplus hatchery-origin fish from integrated hatchery programs operated by WDFW. This is not a “poorly-veiled attempt to make every fish available for harvest”; rather, it is one potential holistic solution to achieve conservation goals mandated by the ESA and harvest needs associated with mitigation responsibilities, treaties, trust responsibilities, and legal agreements.*

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12. Harvest in the Upper Columbia is an important and legal objective (although subject at all times to the ESA). As our recommendations above indicate, harvest programs should be kept segregated by stock and space. Because of the dire conditions for listed fish, the conservation programs should be carefully integrated but should not be complicated by additional harvest objectives. Indeed, it is our belief that there will be greater harvest opportunities on unlisted segregated stocks because the listed integrated stocks will be, rightly so, severely hampered by ESA restrictions.

**Review Team Response:** *Both integrated and segregated hatchery programs have their pros and cons<sup>14</sup>. Segregated programs may be preferred where natural spawning or straying by hatchery-origin fish can be controlled and harvest is the principal goal of the program. On the other hand, integrated programs may be preferred where conservation is one objective of the hatchery program and/or natural spawning by hatchery-origin fish is difficult to control or restrict. Both types of programs can include harvest as a principal goal. The decision to develop and implement one type of program over the other will depend on local habitat issues, the specific goal(s) of the program, and the need to minimize risks to naturally spawning populations. For example, the Review Team concluded that a “Wenatchee River” broodstock at the Leavenworth NFH, integrated genetically with WDFW’s Chiwawa River hatchery program, would reduce risks to natural populations in the Wenatchee River and provide conservation benefits relative to the existing “out-of-basin, segregated” broodstock.*

13. Pg. 8 – the benefit and risk assessment must look beyond the demographic and genetic risks and benefits to include the VSP criteria (McElheny et. al., 2000) as well as behavioral, phenotypic, life history and nutrient risks and benefits. Furthermore, these should be relative to the wild, native stocks, not the hatchery or propagated stock as is prevalent throughout the Assessment.

**Review Team Response:** *The VSP viability criteria of spatial structure and diversity, and other phenotypic characteristics (e.g. behavioral, life history) of a population, are included with our summary of “biological significance”. Our goal is not to assess the status of natural populations; NMFS and the TRT’s are doing that. Our goal is to use the known status of those populations to assess the benefits and risks of our hatchery programs.*

14. Based on the AHA models in Appendix A, the report itself should “grade” the hatcheries relative to their success in satisfying the best management practices (BMPs) under the particular types. (See e.g. Huntington, 2006 Table 3). Simply stating “integrated” or “segregated” is not very discerning relative to an evaluation (however, simply including the AHA graph is not very helpful to the general public either).

**Review Team Response:** *The role of the Review Team is not to “grade” hatcheries but rather to assess the benefits and risks of those programs and recommend changes that would increase benefits (conservation, harvest, cultural, etc.) and/or eliminate or reduce risks. The specific recommendations for each existing program incorporate BMPs (e.g., reduce rearing densities to levels consistent with fish culture guidelines) as an effective means to accomplish resource objectives.*

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<sup>14</sup> Note: The Review Team has adopted the definitions of Moberg et al. (2005) for describing “segregated” and “integrated” hatchery programs. Segregated programs intentionally use only returning hatchery-origin adults for broodstocks and, thus, create a “hatchery-adapted” stock that is genetically segregated from natural populations within the watershed where the hatchery exists. On the other hand, genetically integrated programs systematically include natural-origin fish in the broodstock to maintain genetic continuity with a wild population and minimize genetic divergence of hatchery-origin fish from a natural population.

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15. **Summary of Current Programs** For each program under this section, for each river, there should be an extensive section on Research, Monitoring and Evaluation (RME). For example, the description of the Leavenworth Spring Chinook program states that all unmarked fish are transported above the hatchery and released. What is the annual average? Are any of these fish sampled to determine if they are merely mismarked Leavenworth Hatchery fish? ... All of these questions would and should be answered in an RME section.

**Review Team Response:** *RM&E activities in this region are conducted collectively by the Service's Mid-Columbia Fishery Resource Office, WDFW, Yakama Nation, and other entities. It would be beyond the scope of our report to summarize all those ongoing activities. A very specific question may most easily be answered by referring to Appendix B, the source document from which that information was obtained, or the specific office/individual responsible for the RM&E activity.*

16. It would also be very useful to have a section that compares the total adult returns (hatchery and wild) as compared to the EDT modeled carrying capacity.

**Review Team Response:** *The exercises generating the AHA spreadsheets essentially result in this comparison between mean number of returning adults per year and "all-H" parameters. However, those exercises do not capture inter-annual fluctuations in numbers of returning adults. Those latter statistics and estimates are tabulated in the HGMP for each hatchery program.*

17. It is notable that none of the programs have progressive incubation and rearing strategies, nor were any proposed. Williams et al. (2003) suggests that naturalized incubation and rearing is necessary to improve contributions to recovery purposes and lessen other non-genetic impacts of hatchery fish on their wild counterparts. We have proposed this for many of the conservation-oriented programs.

**Review Team Response:** *In our final report, the Review Team recommended that the Entiat NFH focus on conservation, recovery, and reintroduction activities as an alternative approach to mitigate for hydropower impacts in the mid and upper Columbia River regions. Those "conservation" activities will most likely continue to include the Yakama Nation's coho reintroduction program as well as activities to help recover and restore naturally spawning populations of spring Chinook salmon. As those programs develop and mature, they could very well include "progressive" incubation and rearing strategies, followed by focused RM&E activities to assess their successes relative to their goals.*

18. The statement on pg. 35 regarding "competition between hatchery and ESA-listed, natural original spring Chinook appears to be minimal" lacks complete support.

**Review Team Response:** *This statement was based on (a) the rapidity with which hatchery-released smolts migrate downstream and are detected at McNary Dam and (b) the observed absence of "residualized" hatchery-origin fish in Icicle Creek and the Methow River during the summers following their release. Our reference was thus specific to the watersheds in which fish are released and did not consider potential ecological interactions downstream from McNary Dam or in the ocean. We have corrected our statement in the report accordingly.*



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19. While we agree that the report must identify benefits and risks to the propagated stock and local community, as well as other stocks, we are perplexed why the benefits and risks to the wild, ESA listed native stocks are not spelled out given the priority of protecting and recovering endangered spring Chinook and steelhead.

**Review Team Response:** *Genetic, ecological, and other risks have been exhaustively described in the scientific literature (e.g. loss of within-population genetic variation, predation, etc.), and it would be redundant to state those specific risks repeatedly throughout our report. For example, all fish compete with each other, whether they are in different populations or within the same population. Our goal was to assess the benefits and risks from the perspective of the hatchery program. NMFS continues to assess the specific risks (and benefits) of all hatchery programs on ESA-listed stocks through evaluation of HGMPs, biological opinions, and the permitting process.*

20. Furthermore, we believe it is a legal and biological stretch to consider a highly domesticated, out of basin stock a “back up” to the local endangered stock, despite the length of time the broodstock has been in the system.

**Review Team Response:** *See our response to Comment # 11 of NOAA Fisheries.*

21. Minimal harvest impacts (pg. 39) on listed endangered stocks is not a “conservation benefit” but rather neutral at best and in fact one we consider a biological and legal risk. [Review Team Note: This comment refers to the location of the Leavenworth NFH on Icicle Creek]

**Review Team Response:** *Native American Tribes in the Columbia River Basin are guaranteed fishing rights to salmon and steelhead resources by treaty and legal agreements. The Yakama Nation has agreed to restrict their fishing on spring Chinook, their most highly valued fishery (e.g. first salmon ceremonies, etc.), to Icicle Creek to protect ESA-listed spring Chinook in the Wenatchee River. The location of the Leavenworth NFH on Icicle Creek thus confers an indirect, but very significant, conservation benefit to ESA listed spring Chinook in the Wenatchee River in view of existing treaty obligations and legal precedence.*

22. Under the risks section (pg. 39), we believe that there are additional risks that need to be explored such as behavioral, run timing, long-term fitness etc., that are related to the four VSP criteria of abundance, productivity, distribution and diversity.

**Review Team Response:** *See response to Comment #13.*

23. In addition, the numbers under genetic risk appear to be inconsistent with the reported numbers on pg. 33.

**Review Team Response:** *The reported stray rates of fish from the Leavenworth NFH are consistent in the two sections, but the text has been edited for clarification.*

24. Finally, the Assessment should identify the hatchery barriers (including unscreened intake and outfall pipes) as ecological risks because they impeded natural riverine function such as temperature pockets, movement of gravels and wood debris.

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**Review Team Response:** *These risks are described under “demographic risks” because they primarily affect population growth, productivity, and survival capabilities in the affected stream areas and are not direct ecological risks.*

25. Huntington (2006) reviewed the overall quality of habitat and Northwest Power and Conservation Council’s [NPCC] guidelines for use of artificial propagation in particular habitats. Notably, none of those guidelines or reviews were present in the LHC Assessment. In that habitat review, the Upper Wenatchee, much of the Entiat and significant portions of the Methow stand out as very good habitat for listed spring Chinook and steelhead. In these cases, the NPCC recommends a very different approach to hatcheries than currently operated or proposed by the Assessment.

**Review Team Response:** *We disagree with Trout Unlimited’s belief that our proposed approaches for the Leavenworth, Entiat, and Winthrop NFHs are inconsistent with those recommended by the NPCC. Huntington (2006) has produced a concise, informative report summarizing state, federal, and tribal hatchery programs in the Columbia Cascade Province (Wenatchee, Entiat, Methow, and Okanogan river subbasins). As noted by Trout Unlimited, Huntington (2006; Table 2) included elements of the NPCC’s Fish and Wildlife Plan (NPPC 2000)<sup>15</sup>. The NPCC’s plan defines natural populations within a subbasin by their “biological potential” which includes the “potential capacity, productivity, and life history diversity of a population in its habitat at each life stage” (NPPC 2000, p. 19). However, natural populations are considered to have “low” biological potential – even when they reproduce in outstanding freshwater habitat - when that potential is “limited by external factors, such as the presence of mainstem dams”, or “when downstream rearing conditions severely limit the survival of juveniles from a given spawning area” (NPPC 2000, p. 20). We believe both situations apply for salmon and steelhead in the Wenatchee, Entiat, and Methow Rivers and, hence, we believe our recommended alternatives for our NFHs in those three watersheds are consistent with NPCC’s fish and wildlife plan for the Columbia River basin.*

26. We are surprised by the Review Team’s own analyses that demonstrate none of the preferred alternatives satisfy genetic management requirements of integrated programs (see Appendix A).

**Review Team Response:** *The tables we produced for Appendix A do not report the “realized” or “genetically equivalent” pNOB (mean proportion of the broodstock composed on natural-origin fish each year) for the proposed spring Chinook broodstocks at the Leavenworth and Winthrop NFH’s. Although no natural-origin adults would be included in the broodstocks under those scenarios, “F1 hatchery-origin fish”- representing the offspring of natural-origin adults - would be included in the two broodstocks. From a genetic management or gene flow perspective, those stepping stone models maintain realized pNOBs that are consistent with genetic management requirements for integrated programs.*

**Review Team Note:** *We should point out that the term “integrated” hatchery programs, as defined by the HSRG (Moberg et al. 2005), is not synonymous with “supplementation”, as defined by the Northwest Power and Conservation Council and fishery comanagers in the Columbia River basin. In his original draft report, Huntington (2006) indirectly equated “integrated” with “supplementation”. The term “integrated” refers explicitly to the genetic management goals and protocols of a hatchery broodstock where natural-origin fish are included*

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<sup>15</sup> Northwest Power Planning Council (NPPC). 2000. Columbia River Basin Fish and Wildlife Program. Council Document 2000-19. Available at: [www.nwcouncil.org/fw/program/Default.htm](http://www.nwcouncil.org/fw/program/Default.htm). Note: NPPC was recently renamed the Northwest Power and Conservation Council (NPCC).

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*in the broodstock in a defined, systematic manner to prevent genetic divergence from a natural population. The goal of “integrated” programs is to allow the natural environment to be the principal factor determining the genetic constitution of hatchery-origin fish. A genetically “integrated” broodstock, or “integrated hatchery program”, thus relates to natural origin adults spawning in a hatchery. Conversely, “supplementation” refers to hatchery-origin fish spawning in nature. The two concepts are biologically independent but not necessarily mutually exclusive as management strategies. For example,, many integrated hatchery programs do not include supplementation as a specific objective (e.g., spring Chinook program at the Warm Springs NFH). In these latter cases, “integration” is simply a “best management practice” to reduce the genetic risks of hatchery fish spawning naturally when that natural spawning is difficult to control or cannot be prevented.*

27. TU believes that most of the alternatives proposed and preferred in the LHC Assessment would violate the ESA, especially those that would take endangered fish from the wild to improve the broodstock of the hatchery for mainly harvest purposes.

**Review Team Response:** *Neither the proposed alternatives for spring Chinook at the Leavenworth or Winthrop NFHs would “take endangered fish from the wild” or natural-origin fish for broodstock. Those broodstocks would be composed of a defined mixture of hatchery-origin adults returning to those two hatcheries and hatchery-origin adults from WDFW’s Chiwawa and Methow river programs, respectively. Steelhead are not listed as “endangered” but are listed as “threatened.” (See also our response to Comment No. 11).*

28. Entiat NFH: We support the Review Team’s conclusion to discontinue the current program (pg. 81) ...Because of the high quality condition of the habitat in this system, we cannot see the justification for the continued stocking of fish in this system (although we do propose alternative uses for the facility itself). The Entiat should be set aside as a wild fish reserve. We do support Alternative 4 (pg. 83), using the hatchery facility as a progressive, landscape type conservation facility for upriver stocks, complete with a research component.

**Review Team Response:** *In our draft report, we initially recommended replacing the current, segregated spring Chinook program with an integrated summer Chinook program, primarily to provide fishery benefits in the Entiat River. However, in response to comanager and stakeholder comments on our draft report, we revised our report and now recommend “Alternative 4” for the Entiat NFH to assist with conservation, recovery and reintroduction of native fish species in the mid and upper Columbia River regions.*

29. “..., we cannot support for the statement (pg. 124) that the summer steelhead are playing a role in the restoration of upper Columbia summer steelhead, or that termination of the steelhead program does not have any benefits (pg. 127).”

**Review Team Response:** *We have modified our statements on the noted pages to reflect the issues raised.*

30. We also agree that there should be a segregated harvest program in the mainstem Columbia below Chief Joseph Dam, but do not believe that the source of these fish should be “excess” listed fish from the Winthrop NFH.

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**Review Team Response:** *The future spring Chinook broodstock at the proposed Chief Joseph Dam Hatchery could be developed from one of three sources: Leavenworth NFH, Entiat NFH, or the Methow Composite stock (Winthrop NFH). Both the Leavenworth and Entiat NFH stocks are introduced, non-ESU stocks (Carson NFH ancestry) that would pose the same risks in the upper Columbia River region that they currently pose in the Wenatchee and Entiat rivers, respectively. In contrast, the current Methow Composite stock is considered part of the Upper Columbia Spring Chinook ESU and, thus, is the preferred stock for recolonizing the Okanogan River and for developing a “within-ESU” broodstock at the proposed Chief Joseph hatchery.*

31. We cannot emphasize enough how much better the fish would be by a multi-agency, multi-factor review. This Assessment is a start.

**Review Team Response:** *We agree. The Service is hoping that our reviews will serve as an example to the other comanagers and provide a starting point for more comprehensive evaluations throughout the Columbia River Basin. In this context, artificial propagation and natural reproduction need to be integrated - and coordinated - in a scientifically defensible manner that maximizes the conservation benefits for natural populations while, at the same time, continuing to provide harvest benefits. We believe that both harvest and conservation benefits must be addressed holistically and equitably throughout the basin without one set of benefits being overly-favored at the expense of the other. In the long run, those two sets of goals are neither biologically independent nor mutually exclusive: conservation of the fish and fishery resources within the Columbia River Basin will enhance, not hinder, future harvest opportunities. These are the challenges and problems we seek to address and solve, respectively.*



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