

Spring Chinook Adult Management In the Wenatchee River Basin

Addendum to the Wenatchee River
Hatchery Genetic Management Plans

Washington Department of Fish and Wildlife

October 19, 2010

Purpose

The intent of this addendum is to augment the Hatchery and Genetic Management Plans (HGMPs) for four Wenatchee River spring Chinook programs prepared and submitted to the National Marine Fisheries Service as permit applications under Section 10 of the Endangered Species Act (ESA).

Within these HGMP's, a number of activities have been identified which can be implemented in the hatchery programs; among these are activities for management of returning adult spring Chinook. The primary goal of adult management is to enhance the numbers and success of naturally spawning spring Chinook in the Wenatchee River Basin that will lead to recovery. For this document, adult management is defined as the intentional allocation of returning adult hatchery origin spring Chinook to directly influence the number and origin composition of fish on spawning grounds above Tumwater Dam.

This addendum provides parameters and a decision matrix to supply information necessary to evaluate, on an annual basis, adult management activities appropriate to implement, to best achieve recovery and conservation objectives which fall outside the scope of the HGMP's. Implementation of adult management activities, under the purview of this addendum, apply only to control of the number and/or proportion of hatchery origin spawners (HOR's) needed above Tumwater Dam to meet spawning escapement goals and the management of surplus hatchery origin spring Chinook adults below Tumwater Dam that have been determined by the co-managers to be in excess of recovery and conservation objective needs.

Background

Four separate Hatchery and Genetic Management Plans (HGMPs) for the major tributaries to the Wenatchee River, including the Chiwawa, White, and Icicle Rivers and Nason Creek, were prepared by the combined efforts of the Washington Department of Fish and Wildlife, Yakima Nation, Colville Confederated Tribes, United States Fish and Wildlife Service, the Public Utility District No 1 of Chelan County, and the Public Utility District No 2 of Grant County. These HGMPs were submitted to the National Marine Fisheries Service as permit applications under Section 10 of the Endangered Species Act (ESA) for authorization to carry out artificial spring Chinook salmon propagation (hatchery) programs in the Wenatchee basin. Within the HGMP's, management of returning adult spring Chinook is described as part of the implementation of the hatchery programs.

As part of the HGMP's development process, a Wenatchee Basin Spring Chinook Management Plan was developed through the combined efforts of the Washington Department of Fish and Wildlife, Yakama Nation, Colville Confederated Tribes, United States Fish and Wildlife Service, and the National Marine Fisheries Service (Draft Wenatchee Basin Spring Chinook Management Implementation Plan, 2009). This

management plan is intended to ensure spring Chinook salmon artificial propagation programs in the Wenatchee River basin achieve the following objectives:

- Operates in a manner that is consistent with and contributes to the recovery of the species,
- Meets negotiated court mediated agreements,
- Compensates for lost or degraded habitat function from hydropower projects,
- Mitigates for fish mortality at hydropower projects,
- Benefits society through existence values and harvest opportunities.

In addition, implementation of the Management Plan is intended to guide the management of Wenatchee spring Chinook. Provisions for adult management identified in the Management Plan that are specifically addressed in this addendum are:

1. Distribution (out planting) to minor spawning areas;
2. Consumptive uses (Tribal ceremonial/subsistence, food banks, etc);
3. Nutrient enhancement;
4. Conservation fisheries; and
5. Non-human consumptive use (e.g. rendering plant).

The primary goal of adult management is to enhance the numbers and success of naturally spawning spring Chinook leading to spring Chinook recovery in the Wenatchee River Basin. The primary objective of adult management is to attain as high a proportion of natural origin (NOR) spring Chinook on the spawning grounds as possible, while concurrently achieving an optimum spawning escapement goal and retaining appropriate numbers of broodstock. Other adult management objectives include the social benefits through existence values and harvest opportunities, supplementation of other waters, and nutrient enhancement in basin tributaries.

This addendum is intended to provide a decision matrix by which to annually determine:

- Whether surplus hatchery origin adults exist after meeting basin/tributary specific conservation objectives;
- Whether sufficient natural origin returns (NOR) exist to justify an incidental take associated with adult management activities without exceeding minimum NOR objectives; and
- Which adult management activities should be implemented to minimize risk to NORs while achieving conservation objectives.

Considerations for Implementation

Protocols and criteria are needed to annually evaluate which adult management activities are appropriate to best achieve conservation/recovery objectives. While the HGMP's detail implementation methodology for management within the hatchery environment,

implementation of adult management activities that target managing the impacts of an overabundance of hatchery origin adults on the spawning grounds and the natural environment are less well defined.

Implementation of adult management actions will be dependent upon the ability of the Joint Fisheries Parties (JFP) to reliably estimate, on an annual basis, the number of natural origin and hatchery origin fish to the Wenatchee River and specific tributaries within the Wenatchee River Basin. Confidence in these estimates will likely rely on 1) refinement of methodology used to generate estimates (long term process) and 2) in season adjustments to return estimates based upon actual spring Chinook returns (counts) at specific locations (e.g. Bonneville, Priest Rapids, Rock Island, and Tumwater Dams).

Annual adult management tasks include, but are not limited to:

1. Estimating run size, run timing and, run composition of natural origin returns (NORs) and hatchery origin returns (HORs);
2. Evaluate potential impacts/risks of implementing specific adult management activities;
3. Identifying appropriate adult management activities according to a decision matrix based on the identified impacts/risks (Table 1);
4. Implementation of the approved adult management action.
5. Monitoring of adult management actions to ensure take levels are not exceeded.

The JFP's will prioritize adult management actions (Table 1) as confidence in abundance estimates increase (either as the run progresses up-river, or through refined estimation tools). Prioritization will largely rely on two key factors: 1) the numerical abundance of potential surplus HORs and 2) the composition of surplus HORs (i.e. Carson stock, safety-net/ conservation fish, etc.).

Table 1. Adult Management actions by hatchery program type for removal of surplus hatchery origin spring Chinook from the spawning grounds.

Adult Management Actions	Hatchery Program	Needs prior to this action occurring	Comments
Out plant to Minor Spawning Areas	Conservation Program Fish Only	<p>A. To determine planting locations and numbers.</p> <p>B. To develop a monitoring plan to determine efficacy</p>	While numbers of fish that will be out planted are currently unknown, the capacity for out plants as a use of excess hatchery origin fish is low
Consumption	Safety Net and Conservation Fish	Determine the participation and capacity of recipients to use as food fish (i.e. who, when, storage, transport logistics)	Limited to the number of fish not required for spawning escapement, broodstock, and/or out-planting to minor spawning areas, <i>and</i> limited to recipients ability to receive/handle (logistical limitations).
Nutrient Enhancement	Safety Net and Conservation Fish	Determine appropriate numbers and locations for nutrient enhancement	Limited to the number of fish not required for spawning escapement, broodstock, consumptive uses, and/or out-planting to minor spawning areas.
Conservation Fisheries	Icicle and Safety Net Fish only	Generally, may occur when the run to basin (including Icicle) is composed of $\geq 85\%$ HORs after a minimum run size of 511 NORs is achieved (See Table 2, details/exceptions)	If HOR and NOR run size criteria are met, then conservation fisheries may occur simultaneously with other Adult Management actions.

HOR removal for adult management actions other than conservation fisheries would occur primarily at Tumwater Dam (TWD). If hatchery returns managed (removed) at TWD exceed the capacity for management activities identified in Table 1, the balance may be considered for non-human consumption (e.g. rendering).

Conservation Fisheries

Conservation fisheries, when implemented, are designed to be one of the primary and most cost effective tools for removing surplus HOR's prior to reaching the spawning grounds. Similar fisheries recently implemented for management of surplus HOR summer steelhead in the Upper Columbia have resulted in the removal of up to 30% of all the returning hatchery fish and up to 60% of the hatchery fish available for harvest (adipose fin clipped) (WDFW, Draft 2009 UCR Steelhead Harvest Summary). By managing surplus HOR's, pHOS can be held to the lowest possible values while maximizing pNOB to achieve recovery objectives.

The Joint Fisheries Parties (JFP) recognize that stakeholder support for all adult management activities and recovery planning in general depends on public understanding of the potential recreational and economic benefits which may be realized through recovery efforts. Implementation of a conservation fishery to remove excess safety net program fish would likely occur simultaneously with other adult management actions at TWD. Opportunity for conservation fisheries when the HOR component is large enough to support a targeted fishery provide for public acceptance when other significant adult management actions are pursued.

Potential implementation of a conservation fishery as an adult management action would be based on the hatchery and natural origin run size and composition (Table 2). The JFP would determine the HOR/NOR run size ratio and the composition of HOR's to ensure the production program objectives (Leavenworth National Fish Hatchery (LNFH) and above TWD programs) and run escapement objectives would be met prior to implementation of a conservation fishery. The HOR run size estimate includes both the conservation and safety net fish from the hatchery programs above TWD and the Icicle River fish (LNFH). Any mainstem Wenatchee spring Chinook conservation fishery would only target the Icicle and safety net components.

In most cases, the HOR/NOR run size ratios needed for consideration of a conservation fishery assumes an encounter rate of 15% ($p_{HOR} \geq 85\%$) and a take of 2% or less of the NORs based on a catch and release mortality of 10%. Once management for PNI for the above Tumwater populations reaches 0.67 (greater than 700 NORs), fewer HOR's will be required to meet escapement objectives creating the necessity for a higher proportion of HOR extraction, and a fishery could ensue at a lower ratio of HORs ($p_{HOR} < 85\%$). With an increase in NOR abundance, it is likely that the encounter rate on NOR's would be higher, however managing take levels to 2% would only result in a shortened conservation fishery season with no additional impacts. When the NOR abundance begins to reach and/or exceed spawning escapement objectives, a greater take level (above the 2%) may be considered.

Table 2. Hatchery and Natural origin run size/composition needed to consider implementation of conservation fishery as an adult management action.

NOR run size to Wenatchee River	HOR run size required to consider implementation of a conservation fishery ¹	Comments ²
<511	<4,000	No Fishery
<511	≥4,000	<u>Escapement Ratio Mgt Option</u> Fishery may be considered depending upon the composition of the HOR's – see Sections 4.2 Table 5 and 4.3 of the Wenatchee Basin Spring Chinook Management Plan.
≥511	≥4,000	<u>Escapement + PNI Mgt Option</u> Fishery may be considered depending upon the composition of HOR's see Sections 4.2 Table 5 of the Wenatchee Basin Spring Chinook Management Plan). For NOR run size <631, total run above TWD will be managed for an escapement of 2,077 fish.
700 ³	<4,000 ⁴	<u>PNI Mgt Option</u> NOR abundance level required before population is managed for PNI >0.67. Fishery may be implemented at <4,000 HOR's and managed at the NOR take limit. see Sections 4.2 Table 5 of the Wenatchee Basin Spring Chinook Management Plan).

¹ HOR run size includes Icicle River fish and conservation and safety net fish from above Tumwater hatchery programs.

² Any mainstem Wenatchee spring Chinook conservation fishery only target the Icicle and safety net components.

³ Approximate level when PNI goals are at or above the 0.67 level and fewer HORs are required for conservation objectives. Beyond this NOR level, the number of HORs required to initiate a conservation fishery may be unreasonable.

⁴ In the event a fishery is implemented when pHOR is ≤85%, take limits on NOR's would be managed to ≤2%.

Methodologies for estimating run size, run composition, the potential consequences of implementing various adult management activities, and the characteristics and evaluation of potential fisheries will be evaluated and conducted by WDFW in consultation with the JFP.

Literature Cited

WDFW, Draft 2009 UCR Steelhead Harvest Summary

Public Utility District No 1 of Chelan County, Washington Department of Fish and Wildlife. 2009. Hatchery and Genetics Management Plan. Upper Columbia River Spring Run Chinook Salmon – Chiwawa River Supplementation Program.

Public Utility District No 2 of Grant County, Washington Department of Fish and Wildlife, Yakima Nation, United States Fish and Wildlife Service. 2009. Upper Columbia River Spring-run Chinook Salmon - White River Supplementation Program.

Public Utility District No 2 of Grant County, Washington Department of Fish and Wildlife, Yakima Nation, United States Fish and Wildlife Service. 2009. Upper Columbia River Spring-run Chinook Salmon – Nason Creek Supplementation Program.

U. S. Fish and Wildlife Service (USFWS). Hatchery and Genetics Management Plan. Leavenworth National Fish Hatchery, Leavenworth Hatchery Complex. 2009. Spring Chinook Salmon. Icicle Creek, tributary to Wenatchee River, Columbia River Basin, Washington State.

Yakima Nation, Washington Department of Fish and Wildlife and Peven Consulting, Inc. 2009. Draft Wenatchee Basin Spring Chinook Management Implementation Plan.