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February 28, 2014

Mr. Robert Turner  
Assistant Regional Administrator  
National Marine Fisheries Service  
510 Desmond Drive SE, Suite 103  
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Dear Bob:

We provide the enclosed summary of harvest management objectives for Puget Sound Chinook for the 2014–2015 season (Table 1), and related management documents, as a basis for the National Marine Fisheries Service's (NMFS) consultation and authorization of fisheries under Section 7 of the Endangered Species Act. The summary details the following changes in management from the 2010 Puget Sound Chinook Harvest Management Plan which otherwise continues to provide the basis for our proposed fisheries for the 2014 fishing year:

- The Lummi Nation and the Nooksack Tribe may extend ceremonial and subsistence fisheries for early Chinook in the Nooksack River through the end of June, contingent on in-season monitoring fishery impacts compared to the pre-season limit on mortality of natural-origin, early Chinook. These data, together with updated information on population status and fishery composition, will be assessed in consultation with the NMFS in early June, to inform a decision on extending the fishery.
- Harvest of Nisqually Chinook will be managed under a lower exploitation rate ceiling of 52%. A further adjustment of the exploitation rate ceiling is anticipated, when a revision of the Fishery Regulation Analysis Model is implemented. A Low Abundance Threshold of 700 is established, signaling critical status, with an associated reduction of the exploitation rate in southern U.S. fisheries (Critical Exploitation Rate Ceiling). Harvest management is linked to continuing operation and evaluation of the weir to control the number of hatchery-origin spawners and better estimate escapement.
- A management plan for Skokomish River fall Chinook has been developed, as specified in the 2010 Management Unit Profile. The exploitation rate ceiling will remain at 50%, but changes in production at the George Adams Hatchery are specified, to improve potential for effecting recovery using the extant stock.

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- After updating recruitment from recent brood years of Skagit summer-fall Chinook, we concluded that productivity has not changed and the exploitation rate ceiling of 50% will achieve criteria for survival and recovery of this management unit.
- No changes have been made to the management objectives for Green River Chinook for 2014. Even if recruitment from the recent low escapements improves, abundance is unlikely to achieve harvestable surplus in the near term. No directed terminal fisheries will occur in 2014 and pre-terminal impacts will be constrained to the level associated with critical abundance status.

We anticipate a collaborative relationship with the NMFS to assure the conservation standards of the Endangered Species Act will be achieved.

Sincerely,



Mike Grayum, Director  
Northwest Indian Fisheries Commission



Philip Anderson, Director  
Washington Department of Fish and Wildlife

Enclosures

- (1) Table 1
- (2) 2014 Summary Modifications to 2010 PSCHMP Objectives 2-26-14

**Table 1. Exploitation rate ceilings, low abundance thresholds and critical exploitation rate ceilings for Puget Sound Chinook management units for the 2014-2015 season.**

Management Unit	Exploitation Rate Ceiling	Upper Management Threshold	Low Abundance Threshold	Critical Exploitation Rate Ceiling
Nooksack North Fork South Fork		4000 2000 2000	1,000 <sup>1</sup> 1,000 <sup>1</sup>	7% / 9% SUS <sup>3</sup>
Skagit summer / fall Upper Skagit summ Sauk summer Lower Skagit fall	50%	14,500	4,800 2200 400 900	15% SUS even yrs 17% SUS odd yrs
Skagit spring Upper Sauk Upper Cascade Suiattle	38%	2,000	576 130 170 170	18% SUS
Stillaguamish No. Fork Summ So. Fork MS Fall	25%	900 600 300	700 <sup>1</sup> 500 <sup>1</sup> 200 <sup>1</sup>	15% SUS
Snohomish Skykomish Snoqualmie	21%	4,600 3,600 1,000	2,800 <sup>1</sup> 1745 <sup>1</sup> 521 <sup>1</sup>	15% SUS
Lake Washington Cedar River	20% SUS	1,680	200	10% PT SUS
Green	15% PT SUS	5,800	1,800	12% PT SUS
White River spring	20%	1,000	200	15% SUS
Puyallup fall	50%	500 (South Prairie Cr.)	500	12% PT SUS
Nisqually	52%		700	50% reduction of SUS ER <sup>4</sup>
Skokomish	50%	3,650	1,300 <sup>2</sup>	12% PT SUS
Mid-Hood Canal	15% PT SUS	750	400	12% PT SUS
Dungeness	10% SUS	925	500	6% SUS
Elwha	10% SUS	2,900	1,000	6% SUS
Western JDF	10% SUS	850	500	6% SUS

<sup>1</sup> natural-origin spawners.

<sup>2</sup> Skokomish LAT comprises natural escapement of 800 and/or 500 hatchery.

<sup>3</sup> SUS ER will not exceed 7% in 4 out of 5 years.

<sup>4</sup> SUS ER ceiling will be 50% of the difference between 52% and the expected ER associated with fisheries in Alaska and British Columbia

## SUMMARY OF MODIFICATIONS TO MANAGEMENT OBJECTIVES OF THE 2010 PUGET SOUND CHINOOK HARVEST MANAGEMENT PLAN FOR THE 2014-2015 SEASON

Following is a summary of modifications to fishery management objectives described in the Co-managers' 2010 Puget Sound Chinook Harvest Management Plan for the Nooksack Early, Skagit Summer-Fall, Nisqually, Skokomish Fall, and Green River management units, applying to the 2014-2015 fishery management season. Fishery management objectives for other Puget Sound Chinook management units will not change from those stated in the 2010 Puget Sound Chinook Harvest Management Plan.

### **Nooksack Early**

The management intent is to constrain fishery mortality of South Fork and North/Middle Fork natural origin (NOR) Chinook within a NOR Chinook SUS ER ceiling of 7%. This ER ceiling may be exceeded to a maximum of 9% once in 5 years as necessary to ensure full access to harvestable salmon in Pacific Salmon Treaty fisheries. The tribes have identified a minimum C&S requirement of 30 NOR Chinook to meet basic ceremonial and subsistence needs of their communities. Impaired habitat conditions in the watershed are the primary limiting factor for population productivity for the Nooksack populations.

Nooksack River tribal fisheries may take place from April through the end of June, and are managed in-season according to preseason projections and by monitoring NOR Chinook encounters in the tangle net fishery and a total harvest number, including NOR breakout, in the non-selective fishery. In 2014 the co-managers intend to manage the Nooksack River tribal fisheries as they have in recent years and expect that most or all the allowable impact or harvest of NOR Chinook will be taken before June 15, 2014. The tribe(s) may use tangle-net gear in a selective fishery to increase harvest of surplus hatchery fish. NOR Chinook caught in the selective fishery will be released and mortality accounted based on co-manager agreement on an assumed survival rate.

The total number of allowable NOR Chinook mortalities in the Nooksack River tribal fisheries will be projected during pre-season planning based on forecasted terminal area abundance by stock. Pre-season modeling assumptions will be adjusted using results from the most recent postseason estimates of performance, and on stock abundance and composition data collected from fisheries through 2013.

If information available from monitoring indicates the total allowable NOR Chinook mortalities in the tangle net fishery or the harvest limit in the non-selective fishery is not expected to be taken by June 15<sup>th</sup>, the co-managers may propose to extend the Nooksack River tribal fisheries through the end of June. However, the co-managers will gain concurrence from NMFS that the fishery can proceed past June 15<sup>th</sup> before extending any fisheries. No later than June 7, the co-managers will provide key information necessary to NMFS' determination including population-specific escapement estimates and fishery stock composition estimates for years through 2013, the assumed release mortality rate and an estimate of anticipated South Fork Nooksack Chinook and summer steelhead encounters anticipated in the proposed fishery extension. Post season, NOR Chinook and wild steelhead encounters and mortalities will be reported by population. This includes apparent summer run steelhead encounters and mortalities, and having tissues taken and analyzed for DNA from the 2014

fisheries. Other wild steelhead will be assumed to be winter runs, and while reported post season, do not require DNA analysis.

### **Skagit Summer – Fall**

Tribal and WDFW staff updated the cohort reconstruction for Skagit summer – fall Chinook to include brood years 1981 – 2005, to estimate recruitment rates for fitting a production function. The harvest mortality components of cohorts were estimated from CWTs and using exploitation rates from the post-season FRAM runs. Methods for assessing harvest risk were similar to those used previously (Hayman 2008), to compare the probabilities of abundance falling to the critical threshold and increasing to the recovery threshold. These analyses concluded that exploitation rates up to 50% will achieve the jeopardy criteria.

The cohort reconstruction and harvest risk analyses were provided to NMFS' staff. The gaps in age data for some populations, and lack of alternative methods for calculating harvest mortality, precludes reconstructing cohorts for each population, or making a population-specific assessment of harvest risk. Low Abundance Thresholds specified in the Harvest Plan provide additional protection from fishery impacts for each population through implementation of the critical exploitation ceiling when critically low abundance is forecast.

### **Nisqually**

#### ***Exploitation Rate Ceiling***

The 2010 Puget Sound Chinook Harvest Plan identified a 5-year plan for lowering the Exploitation Rate Ceiling (ERC) on unmarked Nisqually Chinook to 47%. Although the 2010 plan was only approved by NMFS for four years (through April of 2014), the ERC was reduced as scheduled during those 4 years, to a rate of 65% in 2010 and 2011, and to 56% in 2012 and 2013.

Reduction of the total exploitation rate on Nisqually Chinook is one tool being used in the on-going experiment in the Nisqually River. The goal of this experiment is to establish, over time, a self-sustaining locally adapted fall Chinook population contributing to the recovery of the Puget Sound ESU. Other tools to achieve that goal include maintaining a minimum commercial terminal harvest rate of 25% on unmarked Chinook, implementation of an integrated stepping stone hatchery program, and helping control pHOS through weir and harvest management actions.

The reduction of the ERC was expected to coincide with full operation of the Nisqually weir, which is intended to limit pHOS in the Nisqually and allow capture of appropriate broodstock for the 'stepping stone' hatchery program. Both of these actions are expected to decrease hatchery domestication, leading to improvements in fitness and increases in abundance of natural origin-Chinook. While the weir was expected to be fully operational by 2011, design problems, flow regimes and large numbers of co-migrating pink salmon have limited its effectiveness at trapping Chinook during their upstream migration.

The timing and magnitude of changes in harvest strategy for Nisqually Chinook must be coordinated with other actions in the watershed, including habitat recovery, implementation of hatchery actions and

management of pHOS through removal of hatchery Chinook in fisheries and at the weir. Due to the unexpected difficulties with operation of the weir, the control of hatchery-origin contribution on the spawning grounds and the transition to the stepping stone hatchery program have not progressed as anticipated since 2010.

An additional complication facing harvest management for Nisqually Chinook is the apparent discrepancy in exploitation rates estimated by FRAM validation modeling versus rates estimated using CWT data. For Nisqually Chinook, FRAM validation estimates of exploitation rates from 2003-2010 were significantly higher than rates estimated by CWT (Hagen-Breaux et al memo, 2013). This means that fisheries planned using the exploitation rates predicted by FRAM during pre-season modeling may result in rates that are lower than expected when estimated using actual CWT recoveries. The co-managers support the development of a contemporary FRAM base period data set from recent-year CWT recovery analysis to alleviate some or all of the bias between FRAM and CWT exploitation rates, and to provide a more reliable estimate of impacts for current fishing season structures. This should ensure that fishery exploitation rates as estimated by FRAM are comparable to CWT-based estimates and to biologically based ERC's. With a priority and collaborative engagement by tribal, WDFW and NOAA Fisheries staff, we expect this FRAM base period upgrade project can be completed and ready for application with the 2015 or 2016 pre-season planning process.

Given the time needed for completion of a necessary FRAM upgrade, and because of the slower than expected pace of progress with improvements to hatchery and pHOS management, it is appropriate to modify the schedule for the final step of transition to the EDT-advised ERC. In 2014, Nisqually Chinook will be managed for an ERC of 52%, stepping down from the current ERC level of 56%. The ERC of 47% will be re-instated when the FRAM upgrade is complete. If the FRAM upgrade is not completed in time for planning 2015 fisheries, the 52% ERC will remain in place for 2015.

Information gathered from monitoring and presented at the Nisqually Annual Performance Review indicates the need for revising assumptions associated with the co-managers' method for ERC estimation. In addition, changes to estimated exploitation rates resulting from the FRAM upgrade may affect the calculations used in the development of the ERC. The co-managers, in collaboration with NOAA Fisheries, will review the ERC identified in the 2010 Plan (47%) prior to completion of the FRAM upgrade process. This collaborative process will complement efforts already underway by providing additional technical resources and tools to the effort, fostering data exchange and a better understanding of the data and underlying analysis. Based upon outcomes of the FRAM upgrade and the ERC review, the co-managers may propose to revise the ERC. If the ERC has not been revised in time for the 2016 season, the ERC of 47% identified in the 2010 plan will remain in place until such time that the ERC is revised. Slowing the transition to the lower ERC will allow time for implementation of the hatchery and weir components of the strategy, for needed updates to FRAM, and for revision of any assumptions or consideration of available information associated with revising the ERC. A slower transition will also avoid excessive, sudden and unnecessary restrictions to fisheries, by allowing exploratory implementation and assessment of new fisheries regimes that meet the progressively smaller ERC's.

### ***Low Abundance Threshold and Critical Exploitation Rate Ceiling***

The 2010 Puget Sound Chinook Harvest Plan stated that “A LAT will be developed by co-managers in consultation with NOAA Fisheries as information derived from initial implementation of the weir is available. Management to achieve the LAT will ensure that the burden of a conservation response to critical status is not disproportionately placed on terminal area fisheries.” While substantial progress has been made with installation and operation of the weir, information collected to date is not sufficient for calculating an appropriate LAT specific to Nisqually Chinook.

Until sufficient information is collected to develop an LAT specific to Nisqually Chinook, the LAT for Nisqually Chinook will mirror the minimum threshold identified in the weir operations plan. That plan specifies that if there are insufficient natural-origin Chinook returning to the weir in-season to reach 500 spawners upstream, hatchery fish will be passed upstream to minimize the risk of losing genetic diversity. Because 20-30% of the population spawns downstream of the weir, a total weir escapement of 500 would represent a total system escapement of around 700. The LAT for Nisqually Chinook will be an escapement of 700 total natural spawners (natural and hatchery origin). This number is in the range of values that should maintain sufficient genetic diversity to ensure long-term persistence of the population (McElhane et al, 2000).

We expect that with current levels of hatchery production and fisheries designed to meet the ERC for Nisqually Chinook, total escapement will remain well above the LAT for the foreseeable future. Should the pre-season FRAM projection of natural escapement to the Nisqually (natural-origin escapement plus hatchery-origin fish expected to spawn naturally), after accounting for anticipated removals of fish for the hatchery program at the weir, fall below the LAT of 700, the co-managers will modify pre-terminal and terminal fisheries in an attempt to reduce the exploitation rate to the point that escapement will exceed the LAT. If the projected escapement remains below the LAT, impacts in southern U.S. (SUS) fisheries will be limited by proportionally reducing the allowable exploitation rate in the SUS by a minimum of 50%, with the goal of achieving escapement above the LAT. The Critical Exploitation Rate Ceiling (CERC) will be defined as a 50% proportional reduction of the exploitation rate remaining for SUS fisheries under the total ERC after subtracting the expected rate in northern fisheries. For example, in 2013 the ERC for Nisqually Chinook was 56%, and the expected rate in northern fisheries was 15.4%, leaving 40.6% allowable in SUS fisheries. If projected escapement were less than 700, SUS fisheries would be modified in an attempt to increase escapement above the LAT. If escapement was not increased to above 700, the ER in SUS fisheries would be reduced by a minimum of 20.3%, leaving up to 20.3% potentially allowable in SUS fisheries under the critical response.

In addition, should total natural spawning escapement be projected as less than 700 after accounting for anticipated removals of fish for the hatchery program at the weir, the co-managers will allow all Chinook, regardless of origin, to pass the weir from the beginning of that year’s return. Allowing all fish to pass during a year when abundance is expected to be very low will minimize demographic risk that could occur if upstream access was limited to small numbers of natural-origin fish until September 27<sup>th</sup>. Should in-season returns to the weir exceed the low-preseason expectations, hatchery-origin fish returning to the weir would be removed once the minimum of 500 fish (hatchery or natural origin)

above the weir was assured.

### **Skokomish**

A new management plan for Skokomish fall Chinook includes new strategies for managing harvest and hatchery production, and provides an update of the ongoing habitat protection and restoration programs. But recovery efforts will continue to focus on restoration of a spring population, pursuant the Skokomish Chinook Recovery Plan.

Exploitation rate ceilings and escapement thresholds specified in the 2010 Harvest Plan will remain in effect for 2014 and future years. The 50% ER ceiling will continue to achieve the primary objective of maintain adequate natural escapement. Due to dynamic abundance and evolving terminal fishing regimes additional attention will be applied during pre-season planning to improve the accuracy of fishery modeling and reduce the risk of exceeding the ER ceiling.

Managers will begin to implement an experimental strategy to improve the potential for recovery of a true fall Chinook population. A portion of production at George Adams Hatchery will utilize the latest returns as broodstock. The hypothesis is that recruits from this component will spawn naturally, with improved productivity because they are more suited to the local flow regime.

Early-timed production at George Adams Hatchery will be reduced, with intent to reduce their contribution to natural spawning.

### **Green River**

No changes have been made to the management objectives for Green River Chinook for 2014. Even if recruitment from the recent low escapements improves, abundance is unlikely to achieve harvestable surplus in the near term. No directed terminal fisheries will occur in 2014 and pre-terminal impacts will be constrained to the level associated with critical abundance status.