

WDFW Review of Public Comments Received on Columbia River HGMPs August 18, 2004 through October 18, 2004 Comment Period. The comment period was extended an additional 10 days to October 28, 2004 per request from Washington Trout.

WDFW provided 45 Hatchery Genetic Management Plans (HGMPs) covering Lower Columbia River artificial production programs for comment in the period from August 18, 2004 through October 28, 2004. The HGMPs describe, in a format prescribed by NOAA Fisheries, the operation of artificial production programs for salmon and steelhead in the Lower Columbia River region and in the Klickitat River.

A total of 6 individuals and organizations subsequently provided comments to WDFW on the draft HGMPs. Comments ranged from short paragraphs to extensive reviews, all of which are available in their entirety on the WDFW website at the following address: <http://wdfw.wa.gov/hat/hgmp/>. The public comment period resulted in numerous valuable comments and suggestions.

WDFW has provided a response to each of the summarized comments and identified, as needed, enhancements to HGMPs. These enhancements will be provided to NOAA Fisheries during the next year in an interactive, ongoing process leading to a Final Environmental Impact Statement

Response to Comments:

The responses to the HGMPs are organized by the following:

- 1) Individual responses (numbers 1-3) occur on page 2-3.
- 2) Individual representing a group (number 4 -Westport Charterboat Association) occurs on pages 3 & 4.
- 3) PacifiCorp section responses (numbers 1- 89) occur on pages 5 – 23
- 4) Washington Trout section responses (number 1- 88) occur on pages 33-160

Comments 1 – 4 (Individual Comments).

Comment # 1 Hi I'm writing in to let you at the Department of Fish & Wildlife that I'm in favor of hatchery fish production for salmon & steelhead. I feel hatchery programs managed correctly with attention paid to wild runs, are in the best interest for all fisherman. Thank you and keep up the good work, 10/26/2004 12:20:37 PM Phil Klopstein.

Response: HGMP development for salmon and steelhead artificial programs statewide will allow NOAA and state agencies access to the operational information and data needed to make future policy decisions. In some programs, hatchery stocks are being proposed to be used in genetic reserve roles or help in recovery goals. The goal will to continue to use hatcheries to provide mitigation for lost or degraded habitat, provide fishing opportunities and associated economic benefits to communities throughout Washington State, and/or for conservation benefits for listed or depressed stocks..

Comment # 2 I write in support of continuing the hatchery program for cutthroat trout on the Cowlitz and other rivers. I have been hearing about great fly fishing for cutts on several rivers, especially the Cowlitz, and this fall have had several opportunities to fish that river for cutthroat and steelhead. The cutthroat are a marvelous gamefish, willing to take a fly and represent themselves very well when hooked. The fishery provides a nice opportunity, especially when I take my son (10) as I believe he can fish successfully for them. We look forward to fishing for the cutts through November and in future years.

**I have heard that there is talk of stopping this program. Please don't.
Sincerely,
Nicholas Rajacich**

Response: The 45 HGMPs submitted in the current group do not include the Cowlitz River sea-run cutthroat program. It is anticipated that Cowlitz River HGMPs will be submitted in the next group of HGMPs (anticipated by early winter of 2005). HGMP development for salmon and steelhead artificial programs statewide will allow NOAA and state agencies access to the operational information and data needed to make informed decisions. Sport and harvest value of certain programs such as the above mentioned sea-run cutthroat program will need to be reviewed in the context of potential impacts on wild fish as well as providing sport harvest opportunities. FERC relicensing negotiations are on-going at this time and will determine future production and programs in the Cowlitz basin as well.

Comment # 3. I would like to first thank you for extending the opportunities to comment as I am very new at providing my comments to anything. I find it very difficult to not mention, that there is no listing for the Coho's that are not going to be raised at the Little White Salmon/Willard hatcheries any longer. That is a great fishery and to just close up shop is wrong, what happen to the Mitchell ACT funding for this hatchery? How can it just be removed? I would like to also say, that the more upriver brights and Coho's that you can put into the Klickitat river

system the better, we on the east side of the state have to travel a minimum of 2 hours (one way/175 miles) to have quality salmon fishing. The Klickitat is the closest we have and the more fish that are reared and placed into the river system, the better the opportunity we have. How about the Yakima river getting some more Steelhead, Coho, and upriver bright opportunity?

Joe Wiley

Response: The current 45 HGMPs in this group to be submitted do not include the National Fish Hatchery federal programs for the Little White Salmon or Willard Hatcheries. Three programs from the Klickitat River system are covered under this current group of HGMPs including Klickitat Coho, Klickitat Spring Chinook and Klickitat summer steelhead plants. Programs for the Klickitat River system include short term production levels, but long term goals will also reflect the future management and goals of the Yakima Tribe as the hatchery is being transferred to the Yakama Tribe by 2004/2005. Hatchery programs for the Yakima River system are also not covered by this group of HGMPs originating from WDFW. When HGMPs from the Yakima system are submitted to NOAA, a number of subsequent NEPA or future EIS processes will require public meetings and will be the responsibility of NOAA. This would be the opportunity for you to make comments.

Comment # 4 The ocean recreational salmon fishery is dependent upon healthy and numerous hatchery stocks of Chinook and Coho salmon. The majority of the stocks that we catch are produced in the lower Columbia River. As wild stocks rebuild, hatchery stocks must remain plentiful and Coho need to be 100% fin-clipped in order to maintain a viable selective fishery. We are supportive of selective fisheries so long as the encounter rate of keepers remains high enough for anglers to take home at least one fish per day. That appears to be a significant indicator of fishing success for the large majority of anglers. CPUE's consistently less than 1 will ultimately cause a loss of public interest. We experienced a bit of that in 2004 and hope this year was an anomaly as opposed to a trend. The Westport Charterboat Association is supportive of the work being done to reform hatchery management and we trust your staff will keep harvest in mind as the needed changes are implemented. Will you be holding a public meeting of any sorts to discuss the HGMP and the public comments?

**Mark Cedergreen
Westport Charterboat Association**

Response: HGMP development for salmon and steelhead artificial programs statewide will allow NOAA and state agencies access to the operational information and data needed to make future policy decisions. In some programs, hatchery stocks are being proposed to be used in genetic reserve roles or help in recovery goals. The federally funded Mitchell Act facilities have traditionally been viewed as mitigation programs with the objective of providing fish opportunities. In the immediate future, both harvest and conservation goals are being examined for ocean harvest opportunities and contributing to recovery of local stocks. These decisions will be dependant on ESU recovery goals,

specific stocks and WDFW goals of rebuilding wild stocks and providing harvest opportunities. WDFW will not host a public forum for discussion of HGMPs, but all public comments received and WDFW responses to those comments will be submitted to NOAA along with the HGMPs on November 25, 2004. By law, subsequent NEPA or future EIS processes require public meetings and will be the responsibility of NOAA.

The following comments were received from Mr. Frank Shrier, Lead project Manager, PacifiCorp, funding source for the Lewis River Hatchery Complex. They are grouped by biological, or policy comments (Group 1) and to comments that pointed out grammatical, bibliography or syntax errors (Group 2).

Dr. Jeff Koenings, Director
Washington Department of Fish and Wildlife
600 N. Capitol Way
Olympia, WA 98501-1091
ATTN: Andy Appleby, Fish Program

Dear Mr. Koenings:

Thank you for the opportunity to comment on the Lewis River Hatchery Genetic Management Plans (HGMPs). We are encouraged to see development of these plans move forward for the Lewis River. However, we are not certain that the current draft meets the needs of the listed salmonids.

Primarily the plans, as written, provide rationale for the current hatchery operations and do not attempt to suggest adjustments from current practices to accommodate impacts on the listed stocks. Many of the impacts addressed in the plan culminate with a statement that the impacts are unknown. By default your agency appears to be assuming them to be insignificant. For instance, size-at-release has an impact on rearing and return rates for hatchery stocks, and impacts on naturally produced fingerlings in the Lewis River watershed but there are no apparent plans to adjust to release sizes that error on the side of protecting wild stocks.

We encourage your agency to look deeper into the potential impacts of hatchery operations and make adjustments that maintain current production numbers and, at the same time, strive to protect natural fish thereby aiding the recovery of listed stocks.

The following are specific comments on each draft HGMPs.

Lewis River Spring Chinook HGMP

Group 1 Comments:

Comment # 1 Section 1.7,pg. 3, first bullet, the current spring Chinook program at the Lewis River hatchery calls for production of 1,050,000 smolts rather than 900,000.

Response: Total production for the Lewis River system is 1,050,000 spring Chinook. Releases from the Lewis River hatchery total 900,000 fish with an additional 150,000 released from the Fish First, Echo Bay Net Pens. The Echo Bay Net Pen production starts at Lewis River/Speelyai Hatcheries and are transferred mid-winter to that program. Portions of the Fish First production are embedded within the main Lewis River spring

Chinook HGMP. Please note that HGMPs for the Echo Bay 150,000 production program are also being submitted (see also Fish First Echo Bay Net Pen Spring Chinook HGMPs).

Comment #2 Section 1.7, 5th bullet, it is not clear, after reading the HGMP that the 2 major hatchery issues are adequately addressed.

Response: These comments involve Sections 1.6, 1.7 1.8 and 1.16 in the HGMP Template. Section 1.6 of the HGMP template asked the author to choose between “how the hatchery program will enhance or benefit the survival of the listed natural population, or how the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish”. The current HGMP reflects existing goals and operations. Future planning efforts may involve alterations of existing operations. WDFW will be using a number of tools (as described below) to assist in that review.

A tool to assess the biological feasibility of running integrated programs is currently in development. The All H Analyzer (AHA) model has been developed to evaluate salmon stocks in the context of the three “H’s” that affect their health and abundance—Habitat, Harvest and Hatcheries (Draft Puget Sound and Coastal Washington Version 1.1, November 2004). The AHA model is based on recent work by scientists from the HSRG, WDFW, NWIFC, and NOAA Fisheries and relates to gene flow between hatchery and natural populations, fitness loss due to genetic interaction, how variable ocean conditions affect the survival of salmon, and other topics. The AHA model allows users to input data reflecting current habitat productivity/capacity, harvest rates, and hatchery operations. The model then predicts what should result from that set of factors, both in terms of the number of fish returning to the habitat, harvest and hatchery, and the amount of influence the natural environment will have on the composite, integrated hatchery/natural population. The AHA model will be used in conjunction with Benefit – Risk Assessment Procedure (BRAP) and the LCFRB Recovery Plan (2005) to provide direction for integration of programs in the Columbia River system.

Comment #3 Section 1.8, pg. 4, 2nd bullet, item 4 how is it that WDFW's harvest program can ensure that natural ecosystem process are maintained or restored?

Response: In the context of “natural ecosystem processes are maintained or restored”, current harvest levels provide spawner abundance for existing populations. Salmon returning to river systems is important to the ecosystem. “They provide a rich, seasonal food resource that directly affects the ecology of both aquatic and terrestrial consumers, and indirectly affects the entire food- web that knits the water and land together”, (Pacific Salmon and wildlife- Ecological Contexts, Relationships, and Implications for Management, 2000).

Comment #4 Table 1.10, pg. 7, 5th row, how can the performance standard be measured if the NOB does not exist?

Response: Natural origin fish used for hatchery broodstock (NOB) can now be identified by the presence of an adipose fin. While integration of NOB into the integrated program is possible at this time, regional policy has not determined the levels of integration.

Comment #5 Section 1.16.2, pg. 9, Please provide a citation related to the statement made that fish out-migrate quickly. This section only provides one alternative. Are there no others?

Response: Additional citations to support this assertion exists in HGMP section 2.2.3. Although this response requests citations for the statement made that fish “out-migrate quickly”, WDFW also would point out that several factors influence this assertion. Release of the program while fish exhibit “smolting” behavior should coincide with the size of fish and the release of fish during a time period indicated by past history are important considerations. Environmental cues are variable during early spring and also play a role with smolt condition. Although specific studies are not conducted in all basins, the following information is a compilation of some Puget Sound and Columbia River studies (these citations have been clarified and will be inserted in the HGMPs).

1. Studies and monitoring programs on many systems throughout Washington indicate that salmon and steelhead smolts released from hatchery programs migrate rapidly downstream. WDFW researchers demonstrated, on the Elochoman River (WA), that hatchery reared coho moved downstream quickly after release and their snorkeling studies on the Elochoman River indicated few hatchery released chinook remaining after 2 weeks (Fuss et al, 2000). Coho smolts released from the Marblemount Hatchery on the Skagit River migrated approximately 11.2 river miles per day (Puget Sound data from Seiler et al. 1997-2000). Fish released on-station into large river systems may travel even more rapidly – migration rates of approximately 20 river miles per day were observed by steelhead smolts in the Cowlitz River (Harza 1998). Median Travel Time of subyearling chinook, on the mainstem Columbia River, from McNary to Bonneville Dam was estimated to average 8.0 days (29.2 RKm/d) during the years 1997 to 2003 (Memo- Michele DeHart to Bill Tweit (WDFW), 2003). In a study designed to define the migrational characteristics of chinook salmon, coho salmon, and steelhead trout in the Columbia River estuary, Dawley et al (1984), found the average migration rates for subyearling chinook, yearling chinook, and coho salmon and steelhead, were 22, 18, 17, and 35 RKm/d respectively. PIT tagging studies (Bumgarner et al, 2000) have indicated that URB releases from Ringold Springs nine acre rearing pond moved past McNary Dam within the first two weeks (mean travel days - 14) after volitional release, with some of these fish reaching The Bonneville Dam (320 RKm downstream) in two weeks (22.8 RK/day).

Complete citations: -

Dawley, E., C. W. Sims, R. D. Ledgerwood. 1984. A study to define the migrational characteristics of Chinook and coho salmon and steelhead trout in the Columbia River estuary. Coastal Zone and Estuarine Studies Annual Report.

Harza 1998. The 1997 and 1998 Technical Study reports, Cowlitz River Hydroelectric Project Volume 2. Tacoma Power, Tacoma.

Comment #6 Section 2.2.2. pg. 10, first para. the draft salmon recovery plan (LCFRB 2004) does identify minimum viable population sizes for Chinook, steelhead and coho.

Response: Comment noted. Information from the LCFRB 2004 Basin Goals citation will be inserted into the HGMPs.

Comment #7 Table 3, pg. 12, where is the data for 2002 and 2003? The numbers began increasing significantly, since 1999, it would be useful to see where the trend is going in relation to this HGMP. Same page, line 11, please site `another study by the same authors'

Response: Comment noted. Trends have been increasing significantly and Tables will be updated prior to final submission.

Comment #8 Table 4, pg. 13, same comment about updating data

Response: Comment noted. Tables will be updated with available data prior to final submission.

Comment #9 Same page line 8, again please provide citation on quick outmigration of coho. In the next line, if bull trout may exist in the lower Lewis River in very, very small numbers, while your statement of low incidences of coho interaction with bull trout may be true, there should be some clarification as to why that is true.

Response: Comment noted. Statement will be removed in regard to Coho/Bull Trout interactions. While some Lower N.F. Lewis Bull Trout utilization is documented (LCRB, 2004), no information on bull trout abundance in the lower NF Lewis is available at this time nor have there been bull trout observed in hatchery operations on the Lewis system.

Comment #10 Next paragraph, given the recent information on bull trout genetics from Nerass and Spruell (2004) the statements about bull trout subpopulations should be re-written. At the end of the paragraph, you might want to add the following. "Currently, the Pine and Rush creek subpopulations are approaching 1000 spawners.

Response: Comments noted. We acknowledge the Bull Trout information cited in your comment, however information on bull trout abundance in the lower NF Lewis, which is the most pertinent to this program, is not available at this time. Updated information above the reservoirs will be valuable in the future when recovery efforts are underway in those areas and will include ongoing studies and research conducted through PacifiCorp.

Comment #11 Under `Rearing program, pg. 15, first paragraph, last sentence. Need to qualify the statement that indirect take is unknown. Is it believed to be high? low? Less than 50%? Same comment under `Release' section, first para., last line

Response: A review of the factors that could indicate some idea of impact is covered in section 2.2.3. At this time, WDFW does not believe it can quantify indirect take in either numbers or percentages. See also Comment in the Lewis River Winter and Summer Steelhead HGMP

Comment #12 Under 'relative body size' pg. 17 first bullet, Have you considered releasing hatchery fish at a smaller size to reduce the predation risk? This might be especially important for the Lewis since the timing is so late for the fall chinook stock.

Response: Yes. Programming smaller fish-size-at-release could lead to a decrease in potential predation, based simply on predator-prey size relationships. However, the smaller size at release could significantly increase residency time in the river and in turn, expose wild juveniles to a longer period of predatory risk or food competition.

Comment #13 Under 'Residualism' after last sentence, add: However, Tipping and Hawkins did estimate that hatchery coho stomachs contained from 0.05 to 0.11 wild fall chinook fry. This is significant since, given the numbers of hatchery coho releases, anywhere from 1.5 to 3.3 million wild fall chinook fry could be consumed annually.

Response: The Tipping and Hawkins study estimating predation covered hatchery releases of coho, steelhead, and cutthroat. The coho or steelhead predation impact is discussed in the coho and steelhead HGMPs for the Lewis River system. While there are fish size similarities between coho, steelhead, and spring chinook at release, the study did not encounter spring chinook.

Comment #14 Page 24, what is the statement regarding *Saprolegniasis* about? How does this relate to the previous statement?

Response: This statement was in regard to the nutrient enhancement benefit. Carcass supplementation efforts using hatchery carcasses have positive nutrient enhancement effects in many river systems and WDFW is involved in supplying many hatchery carcasses. *Saprolegniasis* incidences in the hatchery could be increasing due to this effort. Increased fungus problems, especially in incubation facilities, are a concern and WDFW is monitoring this, especially where carcasses are placed above hatchery water intakes.

Comment # 15 Section 9.1.2, last sentence, please explain why excess spring chinook are released into Merwin reservoir where they do not contribute to the overall goals

Response: Overages of juvenile fish (above program levels) can be the result of higher than expected survivals of eggs, fry or fingerlings for a particular brood year because of improved hatchery techniques or temporarily optimal environmental conditions, but are uncommon. Production levels above goals cannot be released due to agreed upon production limits and impact constraints to listed fish in the lower Lewis River and Columbia River systems. Overages released into Merwin Reservoir provide additional

recreational harvest for land-locked salmon, although this does not contribute to overall recovery or anadromous production goals, it does provide some benefit. This same strategy is also applied to steelhead. If strategies or practices continue to improve survival at the hatchery and result in frequent overages, regional staff will review and alter broodstock collection accordingly to minimize this occurrence.

Group 2

Comment # 16 Please provide a brief description for 'nya' which is used throughout the text and tables.

Response: “Nya” stands for Not Yet Available. The HGMPs will be standardized to “NA” which will refer to data not available at the time of submittal of the HGMP.

Comment #17 Section 1.4, pg. 2, Table 1.4, the proper way to refer to my company is PacifiCorp.

Response: Comment noted. The reference will be corrected.

Comment # 18 4th bullet, We are confused about the statement regarding mitigation purpose. Our understanding is that the program is mitigation for the Lewis River rather than the Columbia River SPCH production.

Response: Comment noted. We agree, while the spring chinook production contributes to the Columbia mainstem fisheries as well as to the Lewis River basin, the primary purpose of the production is Lewis River mitigation. WDFW will remove that bullet.

Comment #19 3rd bullet, the first sentence is redundant to the previous bullet. The last sentence is difficult to assess how it relates to the subject at hand. In the last sentence on page 4, '(Table 1)' should be inserted after the words Risk Aversion.

Response: Comments noted.

Comment #20 Table 1. 4th row delete the word 'listed' before the words 'non-target listed' 5th row, last sentence, insert 'included in' after the word 'Also,'

Response: Comment noted and corrections made.

Comment #21 Table 1.12, pg 8, What about data for the return years 2000 thru 2003? Since returns have changed dramatically since 1999, it would be very useful to have the data for this evaluation. In the table footnote, please provide a citation for WDFW Stock Assessment Report.

Response: Comment noted. All available data will be entered prior to final submission..

Comment #22 Section 1.13, pg. 8 What hatchery is being referred to here? The Lewis began operation in 1932 and Speelyai began in 1958.

Response: Comment noted. Correction made. The 1974 date refers to the beginning of the L.R. Spring Chinook Program.

Comment #23 Pg. 11, 10th line, delete 'a significant' and insert after the words 'Natural addition'

Response: Comment noted.

Comment #24:

LCFRB 2004 not used in text

Add Norman 1987 (page 11)

NMFS 1999 not used in text

Add PacifiCorp and Cowlitz PUD 1999a (page 13)

Seidel 1983 not used in text

Add Smoker et al. 1951 (page 12)

Add USDI 1998a and 1.998b (page 13)

Washington Department of Fish and Wildlife 1987-2003 not used in text

Washington Department of Fisheries et al 1992 not used in text

Add WDFW 1983 (page 5)

Add WDFW 1990 (page 17)

Add WDFW 1991 (page 6)

Add WMPRG Annual Report 2000

Washington Department of Fish and Wildlife 2001 not used in text

Washington Department of Ecology 2002 not used in text

Wood 1979 not used in text

Response: Comments noted. Changes will be made with regard to citations in the body and the bibliography of the HGMP prior to final submission.

Comment #25 Section 2.2.3, under Broodstock program para, last sentence, The incidence of what? Capture of wild fish? Capture of hatchery fish?

Response: Comments noted. Changes will be made to identify the instance of capture and or handling of listed fish as wild prior to final submission.

Comment #26 Under Genetic Introgression para. last line, Because of the previous sentence, the last sentence has no meaning

Response: Comments noted. Last sentence will be deleted prior to final submission.

Comment #27 Under the 'competition' subsection, 2nd line, replace with word 'they' with 'hatchery fish' Same subsection 4th line, what is meant by 'other areas'? other basins with similar species and hatchery release numbers? Please cite the studies.

Response: Comments noted. Other areas refer to the studies that immediately follow the comment.

Comment #28 Under 'environmental characteristics' pg. 16, the total fall for the Lewis River is actually 7900 feet and the average annual flow is 4,796 cfs according to the USGS historical streamflow website.

Response: Comments noted, changes will be made prior to final submission.

Comment #29 First line, page 17 replace 'this date' with 'the release period'. The sentence beginning 'As spring Chinook ..' is an incomplete sentence. What are you trying to say?

Response: Comments noted, additional clarification will be added prior to final submission.

Comment #30 Last sentence, the current hatchery production for spring chinook is 1,050,000

Response: Also refers to Comment # 2. The 900,000 fish production level described in this HGMP is for releases from the Lewis River hatchery. See HGMP section 1.7 for additional production.

Comment #31 Page 18, 5th line, replace 'peeking' with 'peaking'.

Response: Comment noted and corrections will be made prior to final submission.

Comment #32 Last sentence before Table 5, after 'unknown' add: but is likely to occur given the size of the natural fish at emergence and the extended emergent period for those natural fish. Add the same info to the end of the 'Listed Coho' subsection..

Response: Comment noted. Changes will be made to the "Potential Lewis River spring chinook predation and competition effects on listed salmonids" in section 2.2.3 to indicate predation risk on listed fish up to 55 mm prior to final submission.

Comment #33 Page 19 under 2nd bold heading, 4th line, there are two other factors that should be mentioned: size at release and time of release.

Response: Comment noted.

Comment #34 Section 3.4, 2nd paragraph, there is a new version of the sub-basin plan (LCFRB 2004).

Response: Comment noted. Reference will be updated prior to final submission.

Comment #35 Section 3.5, 2nd paragraph, `predate' is not a word, use `prey'

Response: Comment noted. Edits will be made prior to final submission.

Comment #36 Under the subsection 3), how do the multiple programs create a positive impact? Please explain.

Response: The phrase “multiply programs” is used in this context as an introductory phrase alerting the reader to an upcoming list. Sub-section 3 asks for other species that could (emphasis added) positively impact the program” (in this case the Lewis River hatchery spring chinook program). Given that, it seems appropriate to list other known hatchery and natural production in the basin.

Comment #37 Under subsection 4), the statement that the hatchery program may be filling an ecological niche is speculative. The hatchery program could just as easily crowd natural fish out of a natural niche. 2 sentences later: Wild co-occurring salmonids might be benefited OR they might be crowded to the margins by the larger, more aggressive hatchery fish where they can be more easily captured by predators.

Response: Comment noted.

Comment #38 Section 4.1, pg. 25, there is actually 13,496 gpm available at the Speelyai Hatchery diversion but, because of leakage at the dam, only about 10,7978 gpm is captured for use.

Response: Comment noted. Document will be corrected prior to final submission.

Comment # 39 Section 5.3, pg. 26, the second sentences incomplete.

Response: Comment noted. Document will be corrected prior to final submission.

Comment # 40 Section 5.7, pg. 27, replace `comprised' with `compromised'

Response: Comment noted. Document will be corrected prior to final submission.

Comment # 41 Section 6.1, pg. 28, Lewis River Hatchery is at RM 15.7 and Merwin dam is at RM 19

Response: Comment noted. Document will be corrected prior to final submission.

Comment # 42 Section 9.1.6 the first sentence beginning "A fish health..." is incomplete and needs rewording. Section 9.1.7, 3rd bullet, the splash curtains can isolate or do isolate incubators? Section 10.1 change Max. No. to 1,050,000

Response: Comments noted. Isolate in this instance, is meant to isolate stack incubators individually.

Comment # 43 Section 10.9, 3rd sentence, "Prior to this examination..." sentence does not make sense

Response: Comment noted and sentence will be clarified prior to final submission.

Comment # 44 Section 12.2, PacifiCorp should be listed as funding this program.

Response: Comment noted and sentence will be clarified prior to final submission.

Comment # 45 Section 12.9, first line, switch `of with `or' - `number or range of fish'

Response: Comment noted

Comment # 46 Section 13 The following edits need to occur:

Berg and Nelson. 2003 not used in text

Byrne and Fuss 1998 not used in text

Add Col. River Progress report 2003-16 (page 17 of text)

Add Comanagers Fish Health Disease Policy 1998 (page 6 of text)

Add Cederholm et al. 1999 (page 23 of text)

Enhancement planning team 1986 not used in text

Add EA Engineering 1999 (page 16)

Add Faler and Bair 1996 (page 13)

Add Fuss 2000 (page 15)

Fuss et al. 2000 not used in text

Add Fuss and Byrne 1995 (page 15)

Gregory, et al. 1987 not used in text

Add Groot and Margolis 1991 (page 23)

Harlan 1999 not used in text

Add Harza 1998 (page 15)

Harza 1999 not used in text

Hershberger and Iwamoto 1981 not used in text

Add Howell et al. 1985 (page 12)

Add Hymer et al. 1992 (page 28)

Add Kalama Research Report 2003

Kline et al. 1997 not used in text

Add LCSCI 1998 (page 18)

Levy 1997 not used in text

Add Lucas and Pointer 1987 (page 12)

Add Lavoy and Fenton 1983 (page 12)

Add Lower Columbia River FMEP 2002 (page 43)

Add McMillan 1985 (page 12)

Add Myers et al. 1998 (page 28)

Add Myers 2002 (Page 29)

Add McNeil and Himsworth 1980. (page 23)

Mathisen et al. 1988 not used in text

Miller 1953 not used in text

NMFS 1999 not used in text

Add NMFS 2004b (page 14)
Add PacifiCorp and Cowlitz PUD 1999a (page 13)
Petit 1990 not used in text
Seidel 1983 not used in text
Slaney and Ward 1993 not used in text
Slaney et al. 2003 not used in text Steward and Bjornn. 1990 not used in text
Add USDI 1998a and 1998b (page 13)
Washington Department of Fisheries 1991 not used in text
Washington Department of Fish and Wildlife 1987-2003 not used in text
Washington Department of Fisheries et al 1992 not used in text
Add WDFW 1990 (page 17)
Add WDFW 1991 (page 6)
Washington Department of Fish and Wildlife 1998 not used in text
Washington Department of Fish and Wildlife 2001 not used in text
Add WDFW SaSI 2002 (page 29)
Washington Department of Ecology 2002 not used in text Wood 1979 not used in text

Response: Comments noted. Changes will be made with regard to citations in the body and the bibliography of the HGMP prior to final submission.

Lewis River Winter and Summer Steelhead HGMP

Group 1 Comments:

Except where noted, these comments apply to both the Lewis River winter steelhead HGMP and Lewis River summer steelhead HGMP.

Comment # 47 Section 1.7, pg 3, bullet No. 3 (bullet No. 5 for summer steelhead)
It is unclear whether recovery efforts are directed at steelhead that are produced naturally, by hatchery or both. In addition, recovery should be defined somewhere with a citation or defined specifying what exactly the recovery goals are.

Response: The “Isolated Harvest” program is meant to provide harvest opportunity while meeting NOAA criteria for permitting hatchery programs under ESA. Both of these program objectives (harvest and limiting impacts) can be accomplished by being able to identify hatchery fish. If future recovery goals for the steelhead on the Lewis River system require supplementation, then an integrated program could be considered instead of the segregated harvest program. Recovery objectives for all Lower Columbia salmon and steelhead populations are being developed in conjunction with WDFW, NOAA and the LCFRB.

Comment # 48 Section 1.8; pg. 4, bullet No. 2
States that harvest rates will be managed in concurrence with the Wild Salmonid Policy. However, there is no information or data to support the objectives of the Wild

Salmonid Policy as stated in Section 1.8. Therefore, how can impacts from the hatcheries be assessed?

Response: Comment noted. Bullet will be reworded to explicitly state that all occurring fisheries for this production will comply with ESA and NOAA Fisheries permits.

Comment # 49 Section 1.16.2; Alternative No. 2

States that the steelhead program supports a popular sport fishery elsewhere (than the NF Lewis River). It should be stated the other locations that this program supports.

Response: “Popular sport fishery elsewhere” means this program contributes to mainstem fisheries such as Puget Island in the lower river.

Comment # 50 Out of basin transfers should be eliminated as recommended by the HSRG 2002.

Response: The current isolated program uses local derivatives from Skamania stock. This stock has been used in programs for many years and remains a management tool to provide steelhead fisheries. If an integrated supplementation program were to be started, then local wild stocks would be used, but the option of Skamania stock or Chamber derivatives could still be retained for a hatchery program in order to provide additional fisheries. (This would be similar to the Kalama River hatchery as wild winter and summer steelhead programs have successfully led to four programs).

Comment # 51 Section 1.16.3 (Reform/investment 1)

The statement referring to manipulation (heating) of the water supply needs further clarification as Merwin hatchery water supply is identical to that used by natural stocks in the river.

Response: If an integrated program were to be implemented, options for rearing and facilities would be reviewed. Besides operational concerns, biological decisions such as creating a one-year smolt would need to be examined. Given these challenges, it is more likely other options would be considered.

Comment # 52 WDFW states that off-site studies (from the Kalama) will be used to assess and adjust hatchery production and release strategies. Nowhere in the document does it discuss what such studies are being done and whether the Kalama River should be used to manage smolt behavior in the Lewis River. Nor does this section describe what practices have changed because of specific information obtained from the Kalama studies.

Response: If an integrated supplementation program were to be started, then existing wild fish would be used. The option of Skamania stock also could still be retained for a hatchery program. This would be similar to the Kalama River programs where hatchery local wild winter and summer steelhead programs and hatchery out of basin winter and steelhead programs co-exist. Smolt behavior management would be a part of these efforts if they existed on the Lewis system. The section does not attempt to refer to changes made because of the Kalama research. What the study has inferred is that where out of basin steelhead have been introduced; “despite several generations of relatively high potential for genetic

introgression, wild summer and winter steelhead maintain a substantial degree of genetic distinction from hatchery stocks” (Studies of Hatchery and Wild Steelhead in the Lower Columbia Region, Progress report 1998, May 2000). Appropriate references will be added to the documents prior to final submission.

Comment # 53 Competition (pg 15 No. 1)

As part of relicensing studies, PacifiCorp conducted detailed assessments of coho outmigration behavior in 2001 and 2002. This 2-year site specific study was not cited in the HGMP. The study used radio-tagged smolts to determine outmigration rates. For both years, the study showed that 40 percent of the tagged coho remained in the N FK Lewis River 22 days after release at RM 15 (Final License Application for the North Fork Lewis River, PacifiCorp 2004, Appendix D, AQU 11 A and B)

Response: WDFW will insert these studies and citations into the coho HGMPs for additional information on the Lewis River. The study demonstrated that once coho yearlings reach the area of tidal influence in the N.F.Lewis (RM 9.1), they vacate the system quickly (within 24 hours). Information on habitat preference of coho released from the hatchery release site at Rkm 25.1) is valuable and also mentions some of the concerns with the risk of planting the coho program at a lower river site downstream of I-5 including straying.

Comment # 54 Monitoring (pg 21)

WDFW states that downstream migrant trapping occurs on the NF Lewis. We do not believe there is any trapping of migrants except at the Cedar Creek trap. Is this what was meant?

Response: This was to characterize the on-going Lewis River Wild Fall Chinook Tagging project ongoing since 1983 (Lewis river Wild Fall Chinook Tagging Project 2003, Columbia River Progress Report 2003-16, Hawkins September 2003). Trapping language will change to more accurately reflect the multiple seining operations.

Comment # 55

WDFW states that it is not feasible to determine take due to hatchery program activities. There should be more discussion on this issue as it is integral to the protection of ESA listed species. It is also identified as a program goal (pg 3: minimize ecological interactions of hatchery steelhead on natural stocks).

Response: The conventions used by WDFW for providing information on projected take are consistent with those of other permitted programs and the information request stated within the HGMP template. Section 2.2.3 , part 3 of the HGMP states: “Provide projected annual take levels for the listed fish by life stage (juvenile and adult) quantified (to the extent feasible) (underline added) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take.” WDFW provides estimates of projected take associated with broodstock capture, handling, or other actions that lead to a direct, quantifiable take. As described in the HGMP, the indirect effects of hatchery production, such as predation and competition, are highly uncertain. Although the HGMPs discuss our current understanding of the potential effects of these indirect factors, it is not currently feasible to quantify the associated take. In other documents, such as: previously submitted HGMPs available on NOAA’s website, Section 10 permits

submitted by USFW, WDFW and ODFW and Biological Opinions for the Columbia River (1999), none attempt quantitative estimates of incidental and indirect takes.

Group 2 Comments:

Except where noted, these comments apply to both the Lewis River Type N Coho HGMP and Lewis River Type S Coho HGMP.

Comment # 56 Tables 1.1.2, Why isn't there data for 2002 and 2003? It would help to know the current trend.

Response: Comment noted. Trends have been increasing significantly and Tables will be updated to 2003 where possible, prior to final submission.

Comment # 57 Section 1.16, page 7, last sentence, it is not true that flushing flows are part of the current relicensing process.

Response: Comment noted. Corrects will be made prior to final submission.

Comment # 58 Section 2.2.2, page 10, line 15, please provide a citation for the 1951 escapement survey mentioned and a citation for the sentence that follows. Please provide a citation for the Cedar Creek smolt trap data as well. In the last sentence on page 10 please explain what is meant by poor trapping efficiency and cite the report.

Response: Citations for all comments: Technical Foundation Reports, LCRFB 2004 Volume II, Chapter 11 Lewis River Subbasin—Lower North Fork.

The DeNeil fish ladder at the Lewis River Hatchery has failed to attract spring chinook adults to the holding pond and is not operated to trap spring chinook adults at this time. Initial trapping in 1985 showed approximately 60% of spring chinook adults used the ladder with the remainder were trapped at Merwin Dam. In subsequent years, Lewis Hatchery noticed that fewer adults chose to use the ladder. Although the coho programs successfully use the DeNeil ladder, it is unknown why spring chinook bypass the system, although ladder design, attraction water and species preferences all must play a role.

Comment # 59 Page 18, second para., it is stated that the 'program is below bull trout area' however, the final critical habitat ruling lists the Lewis River downstream of Merwin dam so potential impacts to bull trout should be addressed.

Response: Information on bull trout abundance in the lower NF Lewis, which is the most pertinent to this program, is not available at this time. Potential impacts are unknown.

Comment # 60 Under 'Residualism' it is stated, 'releases have occurred from acclimation facilities on the natal stream. Please elaborate on where these acclimation facilities are located and the number of coho that are released by this method.

Response: This statement referred to a currently discontinued program (Malinoski Pond), which released 15,000 smolts.

Comment # 61 The last sentence on this page states that downstream migration trapping is occurring on the NF Lewis. Please elaborate on the location and methodology used and a citation for the work completed to date.

Response: N.F Lewis trapping refers to the Cedar Cr smolt trap and the ongoing beach-seining that occurs annually in the N.F. Lewis. See *Lewis River Wild Fall Chinook Tagging Project*, Hawkins, S., 2003; *Residual Hatchery Smolt impact Study: Wild Fall Chinook Mortality*, Hawkins, 1998.

Comment # 62 Table 7.4.2, pg. 31. The caption should read eleven year (1992-2002). There is a lot of missing information. Please provide the egg and juvenile counts for 1992 through 2002 and add 2003.

Response: Comment noted: Information to be added before future submissions.

Comment # 63 Section 7.5, second sentence contradicts first sentence. Aren't some of the mortalities used for nutrient enhancement?
Didn't the test transfer of live fish only occur over one year? Or is this ongoing?

Response: Comment noted. Clarifications will be made to the document prior to final submission.

Comment # 64 Section 7.9, 3rd bullet, 'natural' coho also spawn upstream of the hatchery. Please explain how this is a risk-aversion measure.

Response: Comment noted. Both can be considered a risk aversion because it maintains natural productivity of the population and preserves some level of fitness and viability.

Comment # 65 Section 8.5, first bullet, mating is done randomly but please explain how the 5x5 scheme protects the genetic diversity. Logically it seems this practice would dilute the gene pool diversity since, in the wild, 5x5s do not occur.

Response: For production programs that spawn more than 500,000 eggs in a given day, group pools are used according to guidelines (*Genetic Manual and Guidelines for Pacific Salmon Hatcheries in Washington*). Given the large effective population size needed to generate 500,000 eggs per day, genetic diversity is not considered at risk so the use of 5 x 5 pools would not reduce that. This policy could change with integration of the broodstock in the future. Along with broodstock ratios, spawning protocols as well as some rearing changes would need to occur.

Comment # 66 Section 9.1.1, why aren't performance standards for egg survival and rearing provided? Section 9.1.3, please state the loading density used for the Heath incubators.

Response: Data for egg survival and rearing will be provided in future submissions. Approximately 8,000 eggs are used per tray.

Comment # 67 Section 9.1.6, 2nd row, it is stated that high water temperatures are a source for egg mortality and yet in Section 9.1.3 the temperatures are described as 'quite cold (40 degrees)'

Response: This was a result of early Type S coho incubation at Lewis River Hatchery. For this reason, Type S coho (Sept-October spawners) adults are now transferred to Speelyai hatchery for spawning and incubation.

Comment # 68 Section 9.2.1 please provide the egg and rearing survival standards. Section 9.2.2 please state actual pond loading densities used.

Response: Data will be provided in future submittals of this HGMP.

Comment # 69 Section 10.3, pg. 40, there is a lot of data missing from the table. If I'm reading this table correctly and 'nya' means 'not yet available'. If the case is that there simply were no fry and fingerling releases for all those years then it might be better to discuss just 1993, 1998, 1999, and 2000 in the text and concentrate on a display of yearling releases which is the bulk of the program. Otherwise there's not much value in displaying this table with so much missing.

Response: Type S coho have only been released as yearling fish. The Type N coho table indicates past fingerling and fry releases in the system. Fingerling plants in the Lewis system reflect only those years' plants were made. Fry releases are now recorded in the Fish First RSI program HGMP, which has not been written yet.

Comment # 70 Section 10.8, pg. 41, Out of basin transfers should be eliminated as recommended by the HSRG 2002. Are there plans to alter these practices at the Lewis River Complex?

Response: The current population of coho in many systems is made up of a mix of lower Columbia coho stocks (SaSI 2002). Continued transfer between low river basin area poses little risk of additional loss of local adaptations. The Lower Columbia River Salmon and Steelhead Recovery Plan (5-28-04 draft) identifies a Hatchery Measure (HM 38) recommending development of local broodstocks for coho. WDFW is evaluating this recommendation.

Comment # 71 Section 10.9, pg. 41, the sentence, "Prior to this examination..." does not make sense. Section 11.1.1, pg. 43, 4th line, should be "Mass Marking Program Section 12 seems to be missing information.

Response: Comment noted. Clarification will be added to this section prior to final submission.

Comment # 72 The Take table only have 1 or 2 entries, it would seem to be more efficient to just state the take in one or two sentences.

Response: Comment noted.

Comment # 73 Section 13 The following edits need to occur:

Berg and Nelson. 2003 not used in text
Byrne and Fuss 1998 not used in text
Add Comanagers Fish Health Disease Policy 1998 (page 6 of text)
Add Cederholm et al. 1999 (page 23 of text)
Add EA Engineering 1999 (page 16)
Add Faler and Bair 1996 (page 13)
Add Fish Brood Document 2004
Add Foot, et al. 2000 (page 14)
Add Fuss 2000 (page 15)
Fuss et al. 1998 not used in text Fuss and Seidel 1987 not used in text
Add Fuss and Byrne 1995 (page 15)
Harlan 1999 not used in text
Add Harza 1998 (page 15)
Harza 1999 not used in text
Add Harza 1998 (page 15)
Add Hawkins and Tipping 1999 (page 16)
Hershberger and Iwamoto 1981 not used in text
Add Howell et al. 1985 (page 12)
Add HSRG Hatchery Reform 2004 (page 19)
Add Hymer et al. 1992 (page 28)
Add Kalama Research Report 2003
Add LCSCI 1998 (page 18)
Add Lucas 1985 (page 12)
Add Lucas and Pointer 1987 (page 12)
Add Lavoy and Fenton 1983 (page 12)

Response: Comments noted. Suggested changes will be made with regard to citations in the body and the bibliography of the HGMP prior to final submission.

Comment # 74 Section 1.7, pg 3, bullet No. 4 (bullet No. 6 for summer steelhead)
It is unclear what is meant by "to achieve management".

Response: "Achieve management" means achieve management goals for the current program.

Comment # 75 WDFW Kalama River Studies is cited many times in this document, but it does not appear in the citations section.

Response: A citation for the Kalama River studies will be added to the bibliography prior to final submission.

Comment # 76 Section 1.16.1 (winter steelhead only)
States the Merwin trap is outdated, impacted by flow and needs to be replaced. However, it should also state the Merwin trap is functional and used to meet program goals.

Response: Comment noted.

Comments # 77 2.2.2 States "In 1951, WDF estimate the escapement of spring chinook in the Lewis River at only 100 fish (WDF 1951): This citation does not exist in the Citations section and is absent altogether in the summer steelhead HGMP.

Response: Comment noted. Citation will be added prior to final submission.

Comments # 78 No citation listed for WDF (1990)-

Response: Comment noted. Citation will be added prior to final submission.

Comments # 79 (winter steelhead only) States the North Fork summer steelhead is chronically low in abundance and rated as depressed due to loss of access to available habitat upstream of the dams: Needs citation.

Response: Comment noted. Citation will be added. (SaSi 1992 and 2002 draft) prior to final submission.

Comments # 80 –84 No citation listed for Norman (1987) 2.2.3, Incorrect or no citation listing for Seiler (1997 and 2000), No citation listing for Fuss (2000), No citation listing for Hawking and Tipping (1999)

Response: Comments noted. Citations will be added prior to final submission

Comment # 85 Page 15, Under Hatchery production/density-dependent effects subsection, Indirect take is unknown but, given the first sentence, it would be safe to say that there could be short term effects depending on the time and size of release.

Response: Comment noted.

Comment # 86 Page 17 under sub section Relative Body Size, Is Finstad et al. 2001 or 2002?

Response: Comment noted. Correction made- *Finstad 2001.*

Comments # 87 See comments on sections 3.4 and 3.5 of the Chinook HGMP

Page 23, the Mathisen, et al. cite is list as 1988 in the Section 13. Is it 1988 or 1998 Page 24, change `predate' to `prey'

Section 4.1 - see similar comments on Chinook HGMP Section 4.2, first row, delete the words `diverted from' Section 5.5, Piper citation should be Piper et al. 1982.

Response: Comment noted. Corrections will be made prior to final submission.

Comment # 88 Section 6.2.1 Only Type S coho were used in the original production program. Late-run (Type-N) Cowlitz coho were introduced into the Lewis River basin in the early 1970s and over time, WDFW hatchery practices have attempted to stratify coho production into two groups, "early" (Type S) and "late" (Type N), to meet harvest management requirements

(Hymer et al. 1993). Hymer, J., R. Pettit, M. Wastel, P. Hahn, and K. Hatch. 1993. Stock summary reports for Columbia River anadromous salmonids - Volume III: Washington subbasins below McNary Dam for the Coordinated Information System. WDF, WDW, and CRITFC report # 88-108; prepared for Bonneville Power Administration, Portland, Oregon.

Response: Comments on original production program noted.

Comment # 89 In the first sentence, '(WDF/WDFW)' looks like it was intended to be a citation. Please add the date and citation.

Response: Comments noted.

I hope these comments are useful. The intent of my comments is to have a resulting document that has complete and supportable information that can be used as a reference in regional and local plans so my colleague and I took the time needed to thoroughly review the document.

Again, Thank you for the opportunity to comment. I look forward to the final HGMPs. If you have any questions please call either Erik Lesko at 503-813-6624 or me at 503-813-6622.

Sincerely,

Frank C. Shrier
Lead Project Manager/
Lead Fish Biologist
cc: Rich Turner, NOAA Fisheries

Comments Received from Washington Trout are included in their entirety for clarity. WDFW responses to both general and specific comments follow those appropriate sections.

Comments on WDFW Chinook and Steelhead Hatchery and Genetic Management Plans for Columbia River Tributaries

Submitted to Washington Department of Fish and Wildlife
by Washington Trout,
October 28, 2004

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**Comments on WDFW Chinook and Steelhead
Hatchery and Genetic Management Plans
for Columbia River Tributaries
Submitted to Washington Department of Fish and Wildlife
by Washington Trout,
October 28, 2004**

INTRODUCTION

Washington Trout has reviewed chinook and steelhead Hatchery and Genetic Management Plans currently made available for public review by the Washington Department of Fish and Wildlife. We are submitting the following sets of comments to WDFW for its consideration and response under this established public-input process.

We have not reviewed HGMPs for explicitly experimental chinook, steelhead, and chum programs. Washington Trout is still reviewing NOAA Fisheries' proposed listing decision for Lower Columbia River coho. Without completing that review, we did not consider ourselves adequately prepared to comment on coho operations that could impact the LCR coho ESU. The decision to not review or submit comments on any HGMP currently available for public review should not be interpreted as an endorsement or a rejection of that program. However, where responses in any HGMP parallel or reflect concerns expressed in these comments, we encourage that those concerns be considered.

This review in most part focuses on some general concerns Washington Trout has identified that run throughout all or many of the chinook and steelhead HGMPs. These include our assessment that:

- In general, the HGMPs fail to adequately describe clear performance standards and indicators, or adequately detailed monitoring and evaluation protocols or timetables;
- A number of erroneous and/or unsupported assumptions run throughout the HGMPs;
- There is a consistent failure to quantify, as required, the estimated take of listed Puget Sound chinook;
- The HGMPs fail to describe or reconcile inconsistencies between individual programs and WDFW's Wild Salmonid Policy;
- The HGMPs fail to consider or discuss credible, meaningful alternatives to current programs.

The HGMPs provide little reason to believe that levels of take of listed species attributable to the proposed programs are being or will be effectively contained, or that hatchery benefits justify those impacts. The HGMPs commit to NO readily identifiable, measurable, or appropriate performance standards or indicators. They

fail to identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The HGMP process offers the opportunity to evaluate several broad factors including: the justification for a particular hatchery program; the social, cultural, and economic benefits of the program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted.

Justifications for programs are at best inadequately described. Risks of several types of adverse impacts to listed populations from the described programs appear to be high. Measures to minimize take are either inadequately described or based on assertions left unsupported. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

Many of the HGMPs contain essentially the same answers to critical sections of the HGMP Template that deal with program justifications, performance standards, alternatives to the proposed actions, and the monitoring and evaluation of the proposed action, often utilizing the same vague language, consistently failing to adequately address these particular queries.

The following comments can, and should where appropriate, be applied to most if not all of the HGMPs currently available for public and federal agency review. Several sets of detailed comments on specific, representative HGMPs are included. These specific-HGMP comments address in detail and demonstrate the repeated, often redundant failure of the HGMPs to adequately address critical factors that must be evaluated in order to objectively judge whether the proposed hatchery programs should qualify for take authorization. With some slight variation to account for the minor idiosyncrasies of each HGMP, the individual reviews submitted demonstrate how virtually the same set of comments applies to the same evaluated sections of each HGMP. This pattern is repeated throughout the HGMP package.

Rather than repeat essentially the same set of comments for every HGMP, we believe the critical, central issues addressed in our extant comments can in most instances be applied to all or most of the HGMPs. Therefore, where in any other individual HGMP the responses to the specific sections cited in these reviews are substantively similar to those evaluated in these reviews, or fail to adequately provide the types of required information identified in those reviews, then those elements of our comments that can be reasonably applied to those responses should be considered as submitted comments to that individual HGMP, and should be responded to in the context of every applicable HGMP.

GENERAL COMMENTS AND CONCERNS

Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables

Sections 1.9 and 1.10 require descriptions of Performance Standards, Performance Indicators and related Monitoring and Evaluation programs and procedures. NOAA Fisheries is very clear that identifiable quantitative measures that are clearly related to program goals and objectives and that can serve as monitoring variables be identified. All HGMPs fail to provide or identify such quantitative measures, and in general seem to confuse assertions of goals and objectives with descriptions of standards and indicators. This issue has arisen early in the process of developing the HGMP Template in connection with the Northwest Power Planning Council's Artificial Production Review in the Columbia River Basin, and it is germane to quote the Independent Science Advisory Board (ISAB) review of the Draft Performance Standards and Indicators for Artificial Production in the Northwest Power Planning Council's Artificial Production Review (ISAB 2002-2, February 23, 2000) which NOAA places on its HGMP website as an accompanying document for completing individual HGMPs:

- **A standard is a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met (emphasis added);**
- **Indicators are a list of *measurable metrics* that bear directly on the quantitative determination as to whether or not the standard is being met (emphasis added) (p. 6).**

No HGMP reviewed rises to this elementary standard of articulating performance standards and indicators relevant to program goals and objectives, especially those objectives concerned with quantifying potential levels of take and minimizing adverse impacts on listed fish.

Genuine and appropriate standards and indicators are essential to the establishment and the implementation of hatchery program monitoring and evaluation plans. They establish the list of measurable metrics that could be employed to monitor program performance. In the absence of such metrics, the HGMPs' efforts to describe monitoring and evaluation are inevitably vague, and unacceptably so. No timelines are provided for gathering needed information or meeting performance standards.

This vagueness has the result that neither NMFS nor the public can or will be able to determine whether or not any particular program is achieving its stated or, more often, implied goals and objectives, particularly where take of listed salmon and steelhead is concerned. Washington Trout believes that quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated and then clearly linked to quantitative monitoring variables and monitoring plans containing detailed timelines for achieving biologically appropriate performance standards.

All the HGMPs fail to meet these criteria, despite WDFW responses to public comments on Puget Sound HGMPs (2003) that indicated WDFW understanding of the need to provide the type of specific, detailed information missing from the HGMPs currently available for public review.

Erroneous Assumptions

The HGMPs rely upon tenuous, uncertain, and even false assumptions concerning the rearing and migratory behavior of listed juveniles and the conditions under which competition and predation by hatchery juveniles may occur. The HGMPs simply assume that there is a unique and narrow period of time during which an overwhelming majority of wild juveniles migrate downstream and out of the river basin. Hatchery release protocols that are asserted to be aimed at minimizing adverse impacts on migrating wild juveniles are not reconciled with the planned releases of hatchery juveniles several weeks prior or during periods of wild juvenile swim-up and/or migration.

Wild fish will commonly be available as rearing fish and as downstream migrants in freshwater habitats for a three to four month period. Considerable information in support of this comes from WDFW reports of downstream trapping from the Skagit, Cedar and Green rivers and Bear and Issaquah creeks in the Lake Washington system (Seiler et al. 2002a, 2002b, 2003). These reports provide substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June.

These same fish will be available (as documented in other state and tribal reports) in estuaries and nearshore marine habitats for several additional months (e.g., Beamer et al 2000). Thus, there is really an extended period of up to six months in which problems with competition and predation will occur.

Failure to Quantify Take of Listed Salmon and Steelhead

NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions*, clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible”. Paragraph G is particularly explicit:

“Under the broad definition of ESA, “take” of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When “take” of a listed species is expected in the hatchery operation, *the ESA requires that a numerical estimate be quantified as best as possible*. To meet this objective, a “take table” is appended to the HGMP that, when

completed for each hatchery program, will provide a uniform means to report estimated take (see Table 1) (emphasis added).”

The majority of HGMPs consistently report “unknown” for predation losses involving yearling salmonids and otherwise make no effort to estimate the likely numeric range of actual or potential take, nor do they attempt to explain why such estimates were not or could not be made. It is difficult to see how NMFS could credibly approve any HGMP that does not comply with Paragraph G of the Guidance without forcing the listed resource to bear the entire burden of the risk that arises due to the uncertainty of the *level* of take that is likely to occur from the various acknowledged risk factors related to hatchery practices.

Violations of the Wild Salmonid Policy

Our use of the term “Wild Salmonid Policy” in this review refers to the combination of (1) Policy of Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes Concerning Wild Salmonids plus (2) Additional Policy Guidance on Deferred Issues Concerning Wild Salmonid Policy. Both were adopted by the Washington Fish and Wildlife Commission on December 5, 1997, and together became the existing WDFW Wild Salmonid Policy. The first document is commonly but mistakenly referred to as the “joint policy” since it was never adopted by the Northwest Treaty Indian Tribes.

A second obvious repeated violation of the Wild Salmonid Policy is with respect to the allowable percentages of hatchery fish on the spawning grounds (see Table 2, page 16 of the Additional Guidance). For a high level of similarity of hatchery fish, the maximum percent of the wild spawning population that is of hatchery origin should be 5 to 10%. For an intermediate level of similarity, the limit is 1 to 5%, while the limit for low similarity is 0 to 1%. The violations of this policy element are described in detailed responses to individual HGMPs

Failure to Examine Credible Alternatives

An obvious course of action in view of stated program goals, the alleged and the largely unquantified (or apparently unrealized) benefits resulting from the programs and the potential risks to listed populations, is to reduce or eliminate programs altogether. It appears that consideration of such an alternative would be mandatory.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation for the Columbia Basin*. One of the ISAB’s key findings was an urgent need to develop “robust experiments with *unsupplemented* reference streams” (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin.

Given many programs’ apparently marginal (at best) contribution to catch rates and associated mitigation obligations, it appears that several programs might make

a good candidate for the types of experiments surrounding hatchery closures being recommended by the ISAB and NOAA Fisheries' Salmon Recovery Science Review Panel. The RSRP issued a report of Panel meetings held July 2003, to discuss "how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations" and to "urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units."

These alternatives, it seems to us, would be consistent with overall social and legal mandates listed as "justifications" for many programs, particularly given the value such options would have for other ongoing supplementation experiments. Serious evaluation of these potential alternatives should be undertaken.

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, "most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action." The RSRP found "an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation." In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW's response to public comments, as well as NOAA Fisheries' review of submitted HGMPs.

SPECIFIC HGMPs

WE have included four individual sets of comments to the following HGMPs:

- Kalama River Fall Chinook
- Klickitat River Spring Chinook
- NF Lewis River (Merwin) Winter Steelhead
- Washougal River Skamania Summer Steelhead

The submitted reviews present detailed comments addressing and demonstrating the repeated, often redundant failure of the HGMPs to adequately address critical factors or provide sufficient information to meet the requirements of the HGMP Template.

These comments may appear to address directly only a small fraction of the HGMPs currently under review, and they do not directly address every section of the HGMP Template. However, the election of this review to not specifically comment on any individual HGMP or any HGMP-section describing specific hatchery practices should not be interpreted as approval of that HGMP or practice, or a disinclination to review it. The individual comments demonstrate how virtually the same set of comments applies to the same evaluated sections of each HGMP. This pattern is repeated throughout the HGMPs.

Where in any other individual HGMP the responses to the specific sections cited in the reviews are substantively similar to those evaluated in those reviews, or fail to adequately provide the types of required information identified in those reviews, then those elements of our comments that can be reasonably applied to those responses should be considered as submitted comments to that individual HGMP, and should be responded to in the context of every applicable HGMP.

CONCLUSION

The HGMPs by and large share a central flaw, a general unwillingness or inability to adequately quantify estimates of the harm the individual programs may be doing to listed populations of salmon and steelhead, or estimates of the benefits the HGMPs claim derive from the programs. Levels of take are consistently characterized as unknown. Levels of benefit are described in cursory, vague language; important information about how many fish, caught where, by whom, and at what total value, is rarely if at all provided in sufficient detail. Few adequate standards, targets, or thresholds are offered for either harm or benefit. Efforts to determine and/or monitor levels of harm and benefit, standards for each, or any measures or timetables to meet those standards are not adequately described.

Several fundamental issues must be reconciled in any application for take authorization. What level of take would be authorized? What types of benefits can the level of take be weighed against? What is the difference between current levels and any appropriate standard for those levels? How were those standards determined? How will they be met, when, and how will those efforts be monitored? Failing to provide this important information creates uncertainty that could provide the potentially inappropriate implication that the level of harm is lower than it actually is, and the level of benefit greater. The overall scope and scale of the Columbia River hatchery program is simply too large to responsibly accommodate the level of uncertainty presented in the HGMPs.

Given these significant shortcomings, this review finds the applications apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule.

Comments on WDFW Chinook and Steelhead Hatchery and Genetic Management Plans for Columbia River Tributaries Submitted to Washington Department of Fish and Wildlife by Washington Trout, October 28, 2004

Washington Trout submitted a number of comments to the HGMPs. There are five General Comments and Concerns that occur at the beginning of the document (see above) which in most part, focus on concerns Washington Trout identified that run throughout all, or many of the chinook and steelhead HGMPs. Additionally, comments on four HGMPs: Kalama River Fall Chinook Program HGMP, Klickitat Spring Chinook Production Program, Lewis River (Merwin) Winter Steelhead Program HGMP, and Skamania Summer Steelhead (Washougal River) Program HGMP's are made with the request that individual responses be done for the other 41 HGMPs. The responses to the general comments will serve as response to those same comments were they occur in the other 41 HGMPs. Changes, where indicated, will be made to those documents prior to final submission of the specific HGMP.

Comment #1 Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables.

Response: WDFW has combined section 1.9 - list of "Performance Standards" with section 1.10 (List of Performance Indicators designated by "benefits" and "risks") in order to align the sections together for the benefit of the reader. In the HGMP instructions, "Performance Standards" are designed to achieve the program goal/purpose, and are indicated to be *generally* measurable, realistic, and time specific (emphasis added). Additionally, the NPPC "Artificial Production Review" document for completing the HGMP presents a list of draft "Performance Standards" as examples of standards that *could be applied* for a hatchery program (emphasis added). The existing format has been developed in collaboration with NOAA Fisheries and is similar to other HGMPs submitted by federal and tribal facilities on the Columbia River.

Additional harvest benefit information is supplied in the Lower Columbia River Fisheries Management and Evaluation Plans (FMEP Updated October, 2003) submitted by WDFW. WDFW will be working with NOAA on future revisions and data needs for the HGMPs.

Comment #2 *Erroneous Assumptions*

The HGMPs rely upon tenuous, uncertain, and even false assumptions concerning the rearing and migratory behavior of listed juveniles and the conditions under which competition and predation by hatchery juveniles may occur. The HGMPs simply assume that there is a unique and narrow period of time during which an overwhelming majority of wild juveniles migrate downstream and out of the river basin. Hatchery release protocols that are asserted to be aimed at minimizing adverse impacts on migrating wild juveniles are not reconciled with the planned releases of hatchery juveniles several weeks prior or during periods of wild juvenile swim-up and/or migration.

Wild fish will commonly be available as rearing fish and as downstream migrants in freshwater habitats for a three to four month period. Considerable information in support of this comes from WDFW reports of downstream trapping from the Skagit, Cedar and Green rivers and Bear and Issaquah creeks in the Lake Washington system (Seiler et al. 2002a, 2002b, 2003). These reports provide substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June.

These same fish will be available (as documented in other state and tribal reports) in estuaries and nearshore marine habitats for several additional months (e.g., Beamer et al 2000). Thus, there is really an extended period of up to six months in which problems with competition and predation will occur.

Response : WDFW acknowledges that basin-by-basin juvenile wild stock information is incomplete in many systems (except for Cedar Creek (Lewis River system) and the upper Kalama River (for wild steelhead). Known risk aversion measures are outlined in Section 10.11. Details of the time periods and potential impacts are discussed in Section 2.2.3. These sections point out that time of hatchery release can play a large role in determining level of impacts to listed stocks. (Example – hatchery fall chinook released in mid-June, would avoid a substantial portion of the wild chinook out-migration, which occurs from mid-February to August). These proposed measures act to reduce the potential risk to listed species by reducing through time or space the proportion of the populations that could be encountered. The HGMPs also indicates that delaying the time of release also allows the naturally produced fish to attain additional size, which based on the predator/prey studies cited in the documents, could reduce direct impact.

Comment # 3 Failure to Quantify Take of Listed Salmon and Steelhead NMFS in its January 5, 2002 guidance document titled Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions, clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible”. Paragraph G is particularly explicit:

“Under the broad definition of ESA, “take” of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When “take” of a listed species is expected in the hatchery operation, the ESA requires that a numerical estimate be quantified as best as possible. To meet this objective, a “take table” is appended to the HGMP that, when completed for each hatchery program, will provide a uniform means to report estimated take (see Table 1) (emphasis added).”

The majority of HGMPs consistently report “unknown” for predation losses involving yearling salmonids and otherwise make no effort to estimate the likely numeric range of actual or potential take, nor do they attempt to explain why such estimates were not or could not be made. It is difficult to see how NMFS could credibly approve any HGMP that does not comply with Paragraph G of the Guidance without forcing the listed resource to bear the entire burden of the risk that arises due to the uncertainty of the level of take that is likely to occur from the various acknowledged risk factors related to hatchery practices.

Response : The conventions used by WDFW for providing information on projected take are consistent with those of other permitted programs and the information request stated within the HGMP template. Section 2.2.3 , part 3 of the HGMP states: “Provide projected annual take levels for the listed fish by life stage (juvenile and adult) quantified (to the extent feasible) (underline added) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take.” WDFW provides estimates of projected take associated with broodstock capture, handling, or other actions that lead to a direct, quantifiable take. As described in the HGMP, the indirect effects of hatchery production, such as predation and competition, are highly uncertain. Although the HGMPs discuss our current understanding of the potential effects of these indirect factors, it is not currently feasible to quantify the associated take. In other documents, such as: previously submitted HGMPs available on NOAA’s website, Section 10 permits submitted by USFW, WDFW and ODFW and Biological Opinions for the Columbia River (1999), none attempt quantitative estimates of incidental and indirect takes.

Comment #4 Violations of the Wild Salmonid Policy

Our use of the term “Wild Salmonid Policy” in this review refers to the combination of (1) Policy of Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes Concerning Wild Salmonids plus (2) Additional Policy Guidance on Deferred Issues Concerning Wild Salmonid Policy. Both were adopted by the Washington Fish and Wildlife Commission on December 5, 1997, and together became the existing WDFW Wild Salmonid Policy. The first document is commonly but mistakenly referred to as the “joint policy” since it was never adopted by the Northwest Treaty Indian Tribes.

A second obvious repeated violation of the Wild Salmonid Policy is with respect to the allowable percentages of hatchery fish on the spawning grounds (see Table 2, page 16 of the Additional Guidance). For a high level of similarity of hatchery fish, the maximum percent of the wild spawning population that is of hatchery origin should be 5 to 10%. For an intermediate level of similarity, the limit is 1 to 5%, while the limit for low similarity is 0 to 1%. The violations of this policy element are described in detailed responses to individual HGMPs.

Response : The (1) Policy of Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes Concerning Wild Salmonids plus (2) Additional Policy Guidance on Deferred Issues Concerning Wild Salmonid Policy was adopted by the Washington Fish and Wildlife Commission on December 5, 1997, and together became

the existing WDFW Wild Salmonid Policy. The stated goal of the WSP is to “protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries; non-consumptive fish benefits; and other related cultural and ecological values.” This goal remains important. However, advancements in scientific modeling (EDT, BRAP, SSHIAP, AHA) review by independent science groups (HSRG, TRT), and initiatives for local problem solving (Shared Strategies, species specific recovery plans) are allowing WDFW to substitute tailored management plans for the generic provisions of WSP to shape the path to salmon recovery.

Comment #5 Failure to Examine Credible Alternatives

An obvious course of action in view of stated program goals, the alleged and the largely unquantified (or apparently unrealized) benefits resulting from the programs and the potential risks to listed populations, is to reduce or eliminate programs altogether. It appears that consideration of such an alternative would be mandatory.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a Review of Salmon and Steelhead Supplementation for the Columbia Basin. One of the ISAB’s key findings was an urgent need to develop “robust experiments with unsupplemented reference streams” (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin.

Given many programs’ apparently marginal (at best) contribution to catch rates and associated mitigation obligations, it appears that several programs might make a good candidate for the types of experiments surrounding hatchery closures being recommended by the ISAB and NOAA Fisheries’ Salmon Recovery Science Review Panel. The RSRP issued a report of Panel meetings held July 2003, to discuss “how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations” and to “urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units.”

These alternatives, it seems to us, would be consistent with overall social and legal mandates listed as “justifications” for many programs, particularly given the value such options would have for other ongoing supplementation experiments. Serious evaluation of these potential alternatives should be undertaken.

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding

grounds of many natural spawning stocks. In some cases, this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” The RSRP found “an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation.” In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the Review of Salmon and Steelhead Supplementation (ISAB; 2003), and the Report for the RSRP Meeting Held July 21-23, 2003 (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW’s response to public comments, as well as NOAA Fisheries’ review of submitted HGMPs.

Response: These comments involve Section 1.6, 1.7 1.8 and 1.16 in the HGMP Template. Although in the HGMP template, Section 1.6 is worded to choose between “how the hatchery program will enhance or benefit the survival of the listed natural population, or how the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish”. WDFW concurs that Sections 1.8 and 1.16 (alternatives) need to be clarified for the reader.

Section 1.6 Integrated Harvest - The proposed integrated strategy for this program is based on WDFW’s assessment of the genetic characteristics of the hatchery and local natural populations, the current and anticipated productivity of the habitat used by the populations, the potential for successfully implementing as isolated program, and NOAA’s proposed listing determination (69 FR 33102; 6/14/2004). Modification of the proposed strategy may occur based upon NOAA’s final listing determination and as additional data are collect and analyzed.

A tool to assess the biological feasibility of running integrated programs is currently in development. The All H Analyzer (AHA) model has been developed to evaluate salmon stocks in the context of the three “H’s” that affect their health and abundance—Habitat, Harvest and Hatcheries (Draft Puget Sound and Coastal Washington Version 1.1, November 2004). The AHA model is based on recent work by scientists from the HSRG, WDFW, NWIFC, and NOAA Fisheries and relates to gene flow between hatchery and natural populations, fitness loss due to genetic interaction, how variable ocean conditions affect the survival of salmon, and other topics. The AHA model allows users to input data reflecting current habitat productivity/capacity, harvest rates, and hatchery operations. The model then predicts what should result from that set of factors, both in terms of the number of fish returning to the habitat, harvest and hatchery, and the amount of influence the natural environment will have on the composite, integrated hatchery/natural population. The AHA model will be used in conjunction with Benefit – Risk Assessment Procedure (BRAP) and the LCFRB Recovery Plan (2005) to provide direction for integration of programs in the Columbia River system.

WDFW will be making policy decisions to determine changes needed to run an integrated program in order to contribute to recovery. This would include NOAA

decisions on the basin significance of specific populations to ESU recovery. WDFW may propose a number of both short and long-term strategies.

Conversion to a well integrated program will only be possible with the onset of mass marking. In 2003, federal law mandated mass marking of chinook programs in the Columbia River, which would include all Mitchell Act facilities. WDFW has requested federal funds to implement mass marking and upon successful receipt of this funding, marking of brood year 2005 fall chinook will begin in the spring of 2006 (4 year-old adults returning in 2009). Currently, Spring Creek Hatchery fall chinook (14.0 million chinook) are scheduled to be mass marked in spring of 2005. If funds are appropriated, WDFW will be able to plan for marking. If federal appropriations are not forthcoming, then the timeline will be delayed accordingly.

Section 1.8 A legal mitigation justification exists for harvest including: Columbia River Fisheries Development Program, Columbia River Fish Management Plan and U.S.vs.Oregon court agreements.

WDFW protects listed fish and provides harvest opportunity through the Fish Management and Evaluation Plan (FMEP). In addition, fisheries will be managed to insure adult size, timing, distribution of the migration and spawning populations, and age at maturity are the same between fished and unfished populations. By following this policy, fisheries' impacts to listed populations in the Lower Columbia River (LCR) Evolutionary Significant Unit (ESU) will be managed to promote the recovery of these species. WDFW also has received authorization for tributary, Columbia River mainstem, and ocean fisheries; the combined harvest rates in the Fisheries Management and Evaluation Plan (FMEP), Columbia River Fish Management Plan (CRFMP), and ocean fisheries are reviewed annually in the North of Falcon process to ensure the harvest rates are consistent with recovery of the Kalama River fall chinook population.

Section 1.16

The HGMP template request "alternative actions considered for attaining program goals, and reasons why those actions are not being proposed." WDFW has interpreted this to mean current program goals as listed in Section 1.7. The alternatives provided are the result of a multi-agency effort involving NOAA, WDFW, USFWS, CRITFC and members of the public in a series of meetings that reviewed each program individually and developed alternatives, with cost estimates for them. These alternatives have been provided to the Northwest Power Planning Council for consideration.

WDFW Hatchery and Genetic Management Plan:

Kalama River Fall Chinook Program

Comments prepared and submitted by Washington Trout

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October 28, 2004

Comment #6 Section 1.6

The response states: “The proposed integrated strategy for this program is based on WDFW’s assessment of the genetic characteristics of the hatchery and local natural populations, the current and anticipated productivity of the habitat used by the populations, the potential for successfully implementing as isolated program, and NOAA’s proposed listing determination (69 FR 33102; 6/14/2004). Details on the methods WDFW employed to make these important assessments, and the actual findings of those assessments, would be helpful in this section.

The response expresses confidence that, mass marking would make “possible” an “accurate level of integration,” and reports that funding has been requested to begin implementation of an effort to mark all program releases. No information is provided about the funding request, the amount of the request, how long it has been pending, or what its current status is. How will the proposed timeline be affected if successful receipt of the funding is not secured?

Response: See previous response to Section 1.6 in general comments.

Comment # 7 Section 1.8

Guidance from the HGMP Template clearly instructs that responses to this section should indicate *how* integrated harvest programs will be operated to provide fish for harvest “while minimizing adverse effects on listed fish.” This would appear to be the primary purpose for the entire HGMP process for take authorization. Insofar as WDFW attempts to designate conservation as a program purpose, it should acknowledge and respond to the Template’s instruction to provide an indication of *how* the program will “enhance or benefit” the target natural population.

Instead, the response begins with a list of legal and administrative mandates for the *purposes* of the program (the list might have been more appropriately included in a response to Section 1.7). WT believes that some of the acts, agreements, and decisions listed are at least ambivalent in regards to mandating this or any particular hatchery program. It is entirely plausible that several of these mandates could be satisfied by any number of other approaches. Why is it socially, economically, biologically, or even legally necessary or advisable to satisfy these mandates using this program at this facility? There may be several and varied justifications for meeting these mandates through the Kalama River Fall Chinook Program, but they should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to

occur as a result of the program. The response should describe why it is necessary to produce, rear, and release fall chinook under the *specific* protocols proposed – again, in order that such justification can be weighed against the risk of potential take that may occur, relative to other options, including modifying, scaling back, replacing, or even discontinuing the program.

At any rate, this list of purported mandates does nothing to describe *how* the program will minimize adverse impacts on listed populations, or *how* it will benefit the target natural population (or indeed, *how* it will satisfy the listed mandates!). At least, the level of performance relative to the listed mandates should be described in detail in order to justify any biological risks of the program to listed Mid Columbia River steelhead, Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing) and Columbia River Chum. (While the Kalama River is technically outside the MCR steelhead ESU, the likely geographical and temporal scope of various hatchery-impacts should require examination of potential and likely impacts to those listed populations and an assessment of the appropriateness of take authorization relative to those impacts.) While the response includes skeletal information about the legal, social, and political obligations of the program, and provides a cursory identification of some affected stakeholders, it fails to explain the program’s success at providing any expected mitigation or other benefits, and does not supply any quantitative or even qualitative estimates of the economic or social activity that can be directly attributed to the program.

WDFW appears to assume one or both of two things: that because some or all of the listed mandates predate the listing of the relevant ESUs, the “benefit” of raising fish for harvest in the program has already been established, and should not require detailed explication; or that the mere assertion that the program “protects listed fish and provides harvest opportunity ” is adequate to justify the program. Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of relevant 4d Rules and the HGMP template.

At any rate, the response lacks detail sufficient to assure that the program will indeed protect, mitigate, and enhance anadromous fish populations in the Kalama subbasin. In order to meet the HGMP requirement to adequately describe *how* the program will accomplish these goals, measurable, quantitative standards that provide clear threshold levels of benefits to be achieved and potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Table 1 describes aspects of program operations that are intended to reduce risks of potential adverse impacts on listed fish. However, the table only addresses a few selected risk factors; it does not address potential genetic impacts on LCR (or other) chinook populations, potential migration or other behavioral impacts on LCR (or other) chinook populations, or potential harvest impacts on relevant listed populations associated with harvest activities targeting chinook produced by the

program, to name just a few. It does not actually describe in any meaningful way actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. In some cases it appears only to describe what risk aversion measures are necessary.

References to other sections in the HGMP provide little clarification. Neither the table nor the references include or refer to appropriate measurable quantitative standards, and/or rely on dubious or unjustified assumptions and assertions about the sources of adverse impact and how they may best be minimized. The table itself and the information provided in the relevant HGMP references are repeated (often *verbatim*) without extensive case-specific qualifying information in nearly every HGMP. In some cases, program and/or species names are inappropriate to the specific HGMP, clearly indicating a cut-and-paste approach, and a sloppy one at that. It is frankly hard to escape the impression that WDFW does not take this particular ESA-related responsibility as seriously as it should. Boilerplate assertions are not an adequate substitute for honest, thoughtful, specific analyses of individual WDFW hatchery programs and their potential harmful impacts on listed salmon and steelhead populations.

Table 1 references Section 7.9 of the HGMP to provide explication of “Risk Aversion Measures” relative to the “Potential Hazard” associated with Broodstock Collection and Adult Passage. In Section 7.9, NOAA queries applicants: “Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.” WDFW’s response includes the following broad assertion: “Every effort shall be made to promote local adaptation of this spring chinook population and out of basin hatchery transfers of eggs or fish for use as broodstock will only be considered in extreme cases.” While this response may indicate good management-intent (an impression weakened by the same boilerplate response included verbatim in HGMP after HGMP), it is entirely too vague to provide any explication of the specific “Risk Aversion Measures” the program will undertake to avoid relevant potential hazards. A detailed description of *any* of the proposed “efforts” is entirely lacking. How does WDFW define “local adaptation,” and how will it be promoted? What exactly will qualify as “extreme circumstances” that would prompt WDFW to consider out of basin hatchery transfers of eggs or fish?

This unacceptable lack of detail continues throughout the response. The statement that no known genotypic, phenotypic, or behavioral differences separate the hatchery and native populations requires some support. How effectively will the program limit take by identifying and immediately releasing non-target listed fish? How exactly will non-target fish be sorted from the holding pond, handled, and released? Can WDFW provide any estimate of expected mortality or decreased spawning success attributable to those encounters, as brief as they may be? The response to Section 7.9 includes no information regarding adult fish passage. The response does acknowledge that mass marking is necessary. WT concurs, but notes that mass marking is not truly a risk aversion *measure*. Mass marking is a necessary

mechanism for monitoring the performance of various potential risk aversion measures. For instance, mass marking program releases would allow managers to monitor the percentage of HORs present in natural spawning areas to determine the risk of genetic interactions with listed chinook. But the mass marking itself only becomes a mechanism for averting risk when it monitors the impacts of a direct management action (i.e. reducing scale of releases) designed to contain or reduce those risks. No information is provided describing how mass marking will be employed to monitor or contain risks associated with the program.

To provide explication of measures WDFW will employ to avoid potential risk associated with competition and predation, Table 1 references Sections 2.2.3 and 10.11 of the HGMP. Section 2.2.3 presents a relatively thorough attempt to support WDFW's assertion that competition and predation impacts can be minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response to Section 2.2.3 still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds these issues. (See comments on Section 2.2.3.)

The response to Section 10.11 suffers from many of the same weaknesses repeated throughout the HGMP, insufficient detail and support for the broad assertions presented, information contradicted in other sections of the HGMP, a lack of case-specific information and analyses, and no acknowledgement or evaluation of likely risks to neighboring ESUs.

Guidance from NMFS on completing the HGMP Template directs applicants to "cite relevant reports... or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP," and to "provide additional support of critical information" submitted in the HGMPs. WDFW provides no citations or documentation to support many of the assertions made in the response.

The HGMP should at least attempt to quantify the level of take managers would expect when program operations are configured to "minimize impacts on listed fish." What is the target level of "minimized" impact? In its January 5, 2000 guidance document (*Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions*), NOAA Fisheries clearly directs HGMP applicants to supply a "numerical estimate" of expected take from hatchery operations "as best as possible" (paragraph G).

We are aware that in its response to public comments regarding Puget Sound HGMPs, WDFW asserted it was under no obligation to provide take estimates in this context. WT frankly disagrees. We find WDFW's citation in support of this assertion at best inapplicable (WDFW clearly does have the capability to provide *some* reasonable numerical estimate of potential impact from at least several aspects of its hatchery operations). At any rate WDFW's response does not reconcile with the unambiguous guidance provided in the January 2000 document, still referenced by NOAA Fisheries on its HGMP Template web page as providing "important instructions for the completion of an HGMP."
(<http://www.nwr.noaa.gov/1hgmp/hgmptmpl.htm>)

In sum, it appears that the response to Section 1.8 is *inadequate* to meet the requirements of the HGMP Template. As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. The significant shortcomings in this response alone would appear to render this HGMP application inadequate for federal approval.

Response: Refer to general comment number five "Failure to examine credible alternatives".

Comment # 8 Sections 1.9 and 1.10

The Tables on pages 5 - 6 listing Performance Standards, Indicators, and Monitoring and Evaluation measures in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. The exact same tables are presented in nearly every HGMP currently available for public review. Taken by themselves the tables do not comply with the guidance provided in the HGMP Template to provide standards that are "*measurable, realistic, and time specific*" (emphasis added), and to provide indicators that identify "*specific parameters* to be monitored and evaluated." (Emphasis added.) The repetition of this inadequate response throughout the HGMP package suggests an attempt to avoid thorough, case-specific analyses of the risks to listed salmon and steelhead populations presented by WDFW hatchery programs, and/or the specific measures that could potentially eliminate, minimize, or even evaluate those risks.

The tables presented in Section 1.10 are each designated as applicable to either "benefits" or "risks" per Template instructions. In general, the table listing performance standards and indicators for "benefits" comes closer to meeting the Template requirements, insofar as the standards listed correspond to samples provided in the NPPC *Artificial Production Review*. However, in most cases the Indicators listed do not reach the level of measurable specificity directed by the APR.

For instance, the table identifies the following standard: “Assure that hatchery operations support Columbia River fish Mgt. Plan (*US v Oregon*), production and harvest objectives.” This appears to adequately correspond to the following sample provided in the APR: “Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.” (The caveat of “avoiding overharvest of non-target species” is addressed in the following table; see below.) However, the corresponding Performance Indicators do not reach the level of specificity provided in the APR samples:

- *Indicator:* Annual number of fish produced by this program caught in all fisheries, including estimates of fish released and associated incidental mortalities, by fishery.
- *Indicator:* Annual numbers of each non-target species caught (including fish retained and fish released/discarded) in fisheries targeting this population.
- *Indicator:* Recreational angler days, by fishery.
- *Indicator:* Annual escapements of natural populations that are affected by fisheries targeting program fish.
- *Indicator:* Catch per unit effort, by fishery.

This higher level of specificity is required in order to *adequately* judge how the program performs relative to objectives and applicable mandates, and to weigh the relative value of that performance against negative impacts to listed stocks that may occur. It is not credible that WDFW would not have this information available. (In the context of the HGMP Template, the *actual numerical estimates* corresponding to these sample indicators should be provided: i.e., “*Indicator:* 848 Kalama-Program fall chinook harvested; 424 tribal; 222 non-tribal commercial; 222 non-tribal recreational; etc.” This is implicit in the guidance provided in the APR.)

The performance indicator provided is derived from a table provided in response to Section 1.12, reporting “current” program performance. It does not seem appropriate to merely tally up past program performance – not apparently related to any particular goal at all – and simply declare it an acceptable performance indicator for future program operations, particularly when that performance appears to be low both objectively and relative to stated program goals. Expressing the indicator as a total of “harvest plus escapement” masks an apparently low contribution to total catch rates, an average of 848 chinook. There is no accompanying discussion of how adequately these numbers “support” harvest or mitigation objectives, or how such a contribution to sport, tribal, and commercial fisheries can be considered at all “meaningful.” Indeed, the way the numbers are presented in the performance table creates the impression that the program’s contribution to harvest objectives is higher than it actually is.

The listed Performance Standard, “Program contributes to fulfilling tribal trust responsibility mandates and treaty rights” corresponds adequately to a relevant sample provided in the APR. However, the corresponding Performance Indicator is

not an indicator (it really does nothing more than restate the standard), and does not even approach the measurable specificity of the samples provided in the APR:

- *Indicator:* Total number of fish harvested in tribal fisheries targeting this program.
- *Indicator:* Total fisher days or proportion of harvestable return taken in tribal resident fisheries, by fishery.
- *Indicator:* Tribal acknowledgment regarding fulfillment of tribal treaty rights.

(Again, terms like “Total number” and “Total fisher days” should be replaced by *actual numerical estimates*.)

The listed Performance Standard, “Region-wide, groups are marked in a manner consistent with information needs and protocols to estimate impacts to natural and hatchery origin fish” corresponds adequately to a relevant sample provided in the APR. (However, some description of the relevant “information needs and protocols” would be helpful.) But again, the corresponding Performance Indicators are little more than a restatement of the standard, and do little to identify any “specific parameters to be monitored” (HGMP Template), or provide “measurable metrics that bear directly on the quantitative determination as to whether or not the standard is being met” (*Artificial Production Review*; p 3). The listed indicators do not acknowledge or reconcile the admission in previous and subsequent sections that program fish are not marked. We include the following examples from the APR for comparison:

- *Indicator:* Marking rate by mark type for each release group.
- *Indicator:* Sampling rate by mark type for each fishery.
- *Indicator:* Number of marks of this program observed in fishery samples, and estimated total contribution of this population to fisheries, by fishery.

(Again, terms like “Marking rate,” “Sampling rate,” “Number of marks,” and “estimated total contribution” should be replaced by *actual numerical estimates*.)

The table does not include relevant performance standards/indicators for potential benefits associated with every purpose, goal, and/or justification of the program presented in sections 1.6 – 1.8. The APR provides sample performance standards and corresponding performance indicators for mitigation requirements, conservation of wild/naturally spawning populations, and socio-economic effectiveness (see *Artificial Production Review*; pp 6-19). None of these are included in the table. If nothing else, this illustrates an inherent weakness and inefficiency in WDFW’s “one size fits all” cut-and-paste approach to the development of the HGMPs currently available for review.

The “risks” table is even less adequate for the purposes of take authorization. “Minimize impacts and/or interactions to ESA listed fish” is not a bone fide

standard, but at best is a program goal. The APR defines a performance standard as, “a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met.” (Emphasis added.) There is nothing quantifiable in this purported “standard,” and it is described in a way that actually makes it *impossible* to determine whether or not it is being met. What is meant by “minimize?” Will impacts be minimized relative to current levels, or some otherwise determined unacceptable level? What are those levels? How were they identified and/or determined? Exactly which impacts and/or interactions will be minimized, and how will that minimization be achieved? How will compliance with this “standard” be judged?

The APR provides a range of performance standards/indicators that would be pertinent to the goal of minimizing impacts and/or interactions to ESA listed fish:

- Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population.
- Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of the population from which broodstock is taken.
- Broodstock collection does not significantly reduce potential juvenile production in natural rearing areas.
- Life history characteristics of the natural population do not change as a result of this artificial production program.
- Annual release numbers do not exceed estimated basin-wide and local habitat capacity, including spawning, freshwater rearing, migration corridor, and estuarine and nearshore rearing.
- Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.
- Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.
- Artificially produced origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning population.
- Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.
- Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally produced population.
- Weir/trap operations do not result in significant stress, injury, or mortality in natural populations.
- Predation by artificially produced fish on naturally produced fish does not significantly reduce numbers of natural fish.

(Note: We acknowledge that not all of these standards would be specifically applicable to this particular program in this particular ESU. However, we do believe that WDFW has been inappropriately dismissive of the potential genetic and ecological impacts of this program to other listed populations in bordering ESUs [see comments on Sections

2.2 – 2.2.2], and given the verbatim repetition of this table in nearly all the HGMPs currently available for public review, we wish to make these comments as broadly applicable to every HGMP as possible.)

The performance indicators provided in the table fail to meet a level of specificity to qualify as actual indicators. As in the Benefits table, they are generally no more than restatements of the purported standards, or at best lists of possible parameters that could serve as indicators, if they were adequately monitored (and described in measurable terms). Few of the items listed under the heading Performance Indicator are clearly stated as a measurable indicator.

The Monitoring and Evaluation Plans corresponding to the standards and indicators presented in the two tables contain no measurable criteria and no specific descriptions of actions associated with attempts to measure either fishery benefits, or impacts of hatchery releases on listed populations.

For instance, the Monitoring and Evaluation Plan corresponding to the purported standard of minimizing impacts to listed fish includes the statement: “instream evaluations of... NOR/HOR ratio on the spawning grounds.” A mere statement that NOR/HOR ratios of adults will be “evaluated” fails to specify a number for an acceptable target-ratio, much less how such a ratio is to be estimated and where and when it will be measured. An adequate Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish. (An actual performance indicator associated with such monitoring plan might be “the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%.”)

For the purported standard, “Harvest of hatchery-produced fish minimizes impact to wild populations,” no adequate indicators are provided, except in the most general terms (see comments on “benefits” table, above, for samples of more appropriate performance indicators). Likewise, the description of the corresponding monitoring and evaluation measures, “harvests are monitored by agencies and tribes to provide up to date information” provides little useful information. An adequate monitoring plan for these standards and indicators would at very least describe the methods by which catch will be monitored and survival rates estimated.

The failure to adequately respond to this section is acutely disappointing, given WDFW’s response to comments regarding this exact failure in the Puget Sound HGMPs made available for public review in summer 2003. In that response (WDFW; 2003), WDFW offered to revise those HGMPs to “provide *specific, numeric* performance measures for key program characteristics.” (Emphasis added.) As far as we know, the public has not been given opportunity to evaluate whether or how thoroughly those revisions have been completed, but the failure in

this round of HGMPs to provide anything approaching quantifiable performance standards or include any measurable metrics as performance indicators is far from encouraging in this regard.

Response: Refer to general comment number one: “Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables”.

Comment # 9 Section 1.11.2.

The response identifies the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NOAA Fisheries or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur, in the Columbia mainstem, and in the associated estuary and nearshore environments. Some scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of Columbia-wide hatchery releases on listed fish.

We recommend that in addition to listing specific hatchery-program releases, an estimate also be made of the total numbers (by species) of hatchery salmonid juveniles that will be released in the basin, as well as the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating through and out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the Mainstem Columbia between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the Columbia estuary and associated nearshore environments, and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NOAA Fisheries and the public with the appropriate sense of the expected size of the program, and its potential contribution to cumulative impacts on all relevant listed populations from WDFW hatchery programs overall.

Response: WDFW agrees that this information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 10 Section 1.12.

The response provides data on smolt-to-adult survival rates, catch- levels, though no numbers appear to be provided for total adult production levels. No discussion or analysis accompanies the data reported. The average smolt-to-adult survival rate for the brood years 1995 – 1998 appears to be .0542%, varying from a low of

.0299% (1998) to .0815% (1995). No discussion accompanies this to indicate whether these survival rates are acceptable, expected, or a matter of concern, despite clear guidance in the HGMP Template to provide program goals for these parameters.

Insofar as the HGMP proposes to use the average of past program SAR and harvest rates as acceptable performance indicator for future program operations (see Section 1.10), it has an obligation to discuss the relationship of past performance to past goals. Mean performance appears to be low both objectively and relative to stated program goals. The program's annual contribution to total-catch rates averages 848 chinook. Some discussion is due of how these numbers have and will meet stated program objectives to support meaningful harvest or meet mitigation requirements. The HGMPs proposes to integrate the hatchery and natural populations in the subbasin. It seems that some discussion is warranted regarding whether it is appropriate to integrate a hatchery population with such a low smolt-to-adult survival rate into an already depressed, listed, natural-spawning population. While an SAR rate of .0542% may be adequate for a hatchery population that experiences egg-to-emergence survival above 80%, it would certainly not sustain a naturally reproducing population that must tolerate egg-to-emergence survival as low as 10%.

(Further, the table is confusing to this review. No column provides total adult production levels, so we assume that the sum of "Total Catch" and "Hatchery Escapement" equals total adult production for each of the listed Return Years. However, this is not entirely clear because The HGMP instructs applicants to include estimates for hatchery escapement to "natural areas," but the information is not provided and apparently unavailable. It is not identified which return year corresponds to which brood year for determining smolt to adult survival. At any rate, summing up "Total Catch" and "Hatchery Escapement" for any particular return year, and dividing by the annual release goal of 5,000,000 [or alternatively 2,500,000] will not consistently render a survival-percentage estimate that matches any presented in the table. It is possible that release goals were not met for some or all of the brood years, but if that is true it should warrant some discussion in this context. A clearer indication of total adult production is needed, with a clearer indication of each return year's corresponding brood year.)

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

- **Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.**
- **The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed con-specific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.**
- **hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates: A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.**
- **In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.**

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 11 Section 1.16.

The “key issues” summarized in the response are straightforward and unsettling. An unknown proportion of hatchery and wild fish in the broodstock combined with “recent estimates” that HORs comprise 80% of natural spawners is an alarming circumstance. The “alternatives” and “reforms/investments” briefly summarized in the response are not all obviously relevant to the identified key issues. Some only restate aspects of the program proposal described in other sections of the HGMP, and/or obligations WDFW must meet to bring the program into compliance with

various standards and policies. Some of this information appears inconsistent with descriptions of activities at the “Modrow Trap” that appear in other sections of the HGMP.

The table ending the response and its accompanying text appears to be a broad statement of hoped-for project outcomes for the target stocks. It is vague, confusing, offers no definition of terms or how the listed determinations were made, and at any rate does not address in any way alternatives to the program except to imply that “other strategies” will augment the hatchery program.

Some potential alternatives/reforms with more relevance to an examination of actual program alternatives are identified but not discussed. WT concurs with HGMP suggestions to evaluate potential program-alternatives including: reducing the size of the program; placing “greatest concern” on the ecological risks of competition between wild and hatchery chinook; accurately monitoring the integration of broodstock and naturally spawning populations; and monitoring hatchery and wild chinook-juvenile migration to fill important data gaps regarding competition, predation, and disease-transfer risks to listed steelhead, coho, chum, and fall chinook juveniles.

We suggest that these and other alternatives be discussed at length and in detail. The HGMP Template clearly requires that if clear *alternatives to the proposed program* were considered that could potentially meet stated program goals or reduce program impacts, they be described and “reasons why those actions are not being proposed” provided.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates attributable to the program within the basin and neighboring basins are determined to be within the Wild Salmonid Policy guidelines; 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles.

An obvious course of action in view of stated program goals, the alleged and the largely unquantified (or apparently unrealized) benefits resulting from the program and the potential risks to listed populations, is to reduce or eliminate the program altogether. It appears that consideration of such an alternative in this section of the HGMP would be mandatory.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. One of the ISAB's key findings was an urgent need to develop "robust experiments with *unsupplemented* reference streams" (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin.

Given the program's apparently marginal (at best) contribution to catch rates and associated mitigation obligations, it appears that the Basin might make a good candidate for the types of experiments surrounding hatchery closures being recommended by the ISAB and NOAA Fisheries' Salmon Recovery Science Review Panel. The RSRP issued a report of Panel meetings held July 2003, to discuss "how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations" and to "urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units."

The RSRP specifically endorsed the findings and recommendations of the ISAB Review, and made several findings and recommendations of its own. The RSRP found, among other things, that "questions on the negative impact of hatchery fish on wild stocks abound ..., while scant progress has been made toward investigation and resolution of this major topic." The report noted that "In all examples that the RSRP has been able to locate, when experiments were conducted to test claims for the success of hatcheries in promoting the conservation of naturally spawning fish, the initial claims have been proven false." The report found that large-scale experiments involving hatchery closures could test "possible consequences" of current hatchery programs, including:

- Do hatchery releases cause extreme ecological stress to natural fish in streams?**
- Will supplementation hatchery programs increase the number of natural-origin adults on the spawning grounds?**
- Are there only minor negative consequences of taking wild fish for broodstock?**
- Is the increased predation on natural-origin fish in a mixed-species fishery significant?**
- Do hatchery releases seriously influence the marine growth and survival of natural fish?**
- What is the effect of spawners that are strays from production hatcheries on the genetics of wild stock?**

The RSRP explicitly emphasized that “critical data on the demographic and genetic effects of hatchery fish on the wild population can be obtained *only by completely eliminating gene flow from the hatchery to the wild population*, and by observing demographic and evolutionary changes in both populations as they (re)adapt to their own environments” (emphasis added), and that “a full assessment of interacting demographic and genetic effects of hatchery fish on the wild population can only be obtained from additional experiments in which some hatchery programs (if not the entire hatchery) are completely terminated to remove competition between hatchery and wild fish in freshwater and estuarine habitats.” The report recommends an experimental approach that stops or otherwise modifies hatchery production in a watershed and compares various aspects of subsequent performance of the affected wild salmon population with those in a population whose hatchery operations have not been altered.

These alternatives, it seems to us, would be consistent with overall social and legal mandates listed as “justifications” for the current program, particularly given the value such options would have for other ongoing supplementation experiments. Serious evaluation of these potential alternatives should be undertaken.

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” The RSRP found “an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation.” In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW’s response to public comments, as well as NOAA Fisheries’ review of submitted HGMPs.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River in Puget Sound provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically

changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1994-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat recreation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, coupled with relatively intensive habitat protection and recovery, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Response. Refer to general comment number five “Failure to examine credible alternatives. Both current goals and justification of the existing programs in the Lower

Columbia were the result of mitigation for dams. With ESA listings in 1998, WDFW is examining alternatives for integrating the current population to contribute to recovery. Increased assessments, monitoring and recommendations: “*Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003)”, will be used in future decisions.

Comment # 12 Section 2.2.1

This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe: “adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing.” The response does not address, let alone emphasize, “spatial and temporal distribution relative to hatchery fish release locations and weir sites.”

If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

In addition to Lower Columbia River chinook, LCR steelhead, and LCR coho (proposed for Threatened listing), the HGMP should examine the potential for impact from this proposed program to listed populations of salmon and steelhead in the Columbia River Chum, Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. The HGMP Template instructs applicants to identify all listed populations that may be incidentally affected by the program, including all listed populations in the proposed program’s juvenile-release and adult-return areas.

Hatchery-release areas would include at least all freshwater, estuarine, and nearshore marine environments where hatchery juveniles would be expected to pass through and potentially commingle, interact with, and impose ecological impacts on listed fish. In this case, The HGMP appropriately acknowledges those areas would include the mainstem of the Kalama and the “Columbia River corridor,” which would include the mainstem Columbia, its estuary, and associated nearshore environments. Adult-return areas would include at least all estuarine and freshwater areas where HORs of this proposed program would be expected to pass through and potentially impose ecological impacts on listed fish, or where they might be expected to stray to and interact with listed fish on natural spawning areas, potentially imposing ecological and genetic impacts on listed fish. In this case those areas would include the mainstem of the Columbia and its estuary down stream of the Kalama, and tributaries of the Columbia between its estuary and the mouth of the Kalama. Listed fish from the above-named ESUs will be present in all these areas and “may be incidentally affected by the program.”

Response WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

The status of the current listings (proposed) include the hatchery population and available status information accompanies both. Information throughout the HGMP describes hatchery release locations and weir sites. Other sections throughout the HGMP (2.2.3) attempt to describe both spatial and temporal distribution. The potential negative impact for all Columbia ESUs are contained in section 3.5 (Ecological Interactions).

Comment # 13 Section 2.2.2

The response should include appropriate descriptions of the Mid Columbia River steelhead, Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. The status descriptions provided do not identify whether the information requested in this section is available for those ESUs. Without estimates of annual juvenile production and basin capacity, the HGMP cannot provide an accurate description of the scale of proposed hatchery-releases relative to the production and capacity of listed fish in the basin or basins. The HGMP should provide the relevant estimates for affected populations in the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. Estimates should also be provided for total hatchery releases likely to be present in the relevant areas of the Columbia mainstem, so the proposed program's contribution to the overall scale hatchery releases in the mid and lower Columbia basins can be evaluated.

Response WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. NOAA's cumulative effects analysis will be evaluating this.

Comment # 14 Section 2.2.3.

The response presents a relatively thorough attempt to describe program activities that may impact listed populations, and the risks of those impacts. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds some of these issues.

Broodstock Program

In describing broodstock collection at Modrow, the response does not acknowledge information presented in Section 1.16 identifying problems with "unsafe handling of adult listed fish."

The response acknowledges that program hatchery chinook cannot currently be identified from listed adults, and that indirect take from genetic introgression is

“unknown.” While the level of indirect take in this instance may not be specifically “known,” it can be presumed to be quite high, given admissions in other responses that straying of HORs on natural spawning areas is as high as 80%, and that the proportions of natural/hatchery recruits in the broodstock is again, “unknown.” This high potential impact should be discussed at more length in this section, accompanied by proposals to reduce the level of straying to some more acceptable target-level.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 15 Rearing Program

The response acknowledges that the water-intake facility at Fallert Creek is out of compliance with NOAA fish screening standards. The HGMP states that “solutions” have been “identified” to bring the facility into compliance, but no information is provided indicating how long “solutions” have been pending, or what their current status is. No time estimate is provided for bringing the facility into compliance with NOAA standards.

Information provided about fish-passage is confusing, but seems to imply that passage is a concern at Fallert Creek as well, though the response does not include discussion of remedies or timetables other than a cryptic reference to “forwarded” funding requests for “needed improvements.”

The response includes information about water quality permitting and monitoring, but none about applicable water-quality standards or program performance relative to those standards or any other conditions of the relevant permits. The types or amounts of effluent discharged from the hatchery facility are not listed.

Information about disease transfer is vague, if not to say unsettling. The “significant” consequences of outbreaks are described, but little useful information is provided regarding the history of or potential for disease transfer at this facility, other than cryptic indications of “greatly improved” health conditions and success at “reducing” disease outbreaks. What are the pathogens involved? How often have disease outbreaks occurred? What were the consequences? If performance in this regard has improved, by what measure, by how much, and for how long?

Response: WDFW agrees that more information is valuable and may be added in the future. Concerns such as disease are covered in other parts of the HGMP, such as in Section 9.2.7. Effluent monitoring reports can be requested through the NPDES permitting system.

Comment # 16 Release Program

The response provides relatively detailed information intended to support WDFW’s assertion that competition and predation impacts can be effectively minimized by juvenile-release strategies currently employed at most WDFW hatchery programs,

including those proposed in this HGMP. However, the response is weakened by a reliance on some unsupported and sometimes contradictory assumptions, its failure to consider impacts to neighboring ESUs, and its inappropriate reaction to uncertainty.

The response states that 5,000,000 Kalama fall chinook are released “at a time and size that indicates fish are smolted and can emigrate quickly.” The response acknowledges that “Salmon and steelhead feed actively during their downstream migration (Becker 1973; Muir and Emmelt 1988; Sager and Glova 1988) and if they do not migrate they can compete with wild fish,” but then presents information and references to support the assertions that wild and hatchery juveniles are effectively segregated by some behavioral and habitat-preference differences between hatchery and wild juveniles, and “rapid” downstream migration of hatchery juveniles released as smolts.

The response states that, “WDFW is unaware of any studies that have empirically estimated the competition risks to listed species posed by the program described in this HGMP.” This statement is repeated or paraphrased several times throughout the response and in nearly every HGMP. In fact the bulk and substance of the response is repeated essentially verbatim in nearly every HGMP. In the absence of such a narrow study, the HGMP invests a high degree of confidence in “studies conducted in other areas (that) indicate that this program is likely to pose a minimal risk of competition.” At best the referenced studies “suggest” support for the relevant assertion; they do not “indicate” anything in this context. But never mind semantics; without due consideration of studies in “other areas” that may suggest a potential for more than “minimal” competition-impacts from the proposed program, WDFW’s value-standard risks a bias toward particular assumptions about program performance.

The response acknowledges that releases will occur during periods of low to moderate flow, in the middle of the outmigration period for listed juvenile chinook. The language of the response appears intended to imply that the June release was chosen after consideration of the LCFRB data regarding outmigration timing of listed chinook juveniles, based on the “belief” that a June release “allows listed fish time to grow.” The assertion downplays the higher likelihood that the long-established June-release target was rationalized in the face of the 2004 data, and the belief underpinning the rationalization relies on a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats.

Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department’s own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the

timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This suggests it would be extremely unlikely in this case that hatchery smolt releases can be scheduled to temporally segregate them from all wild emigration unless hatchery releases occur in late August or early September. The response fails to acknowledge or address the likelihood of hatchery juveniles interacting with rearing juveniles of other listed species/populations, including populations that employ life-history strategies that include multi-year freshwater rearing.

The response relies on findings in Flagg et al that “it is unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the estuarine environment.” But it does not discuss current work in Puget Sound that strongly suggests hatchery and wild juvenile salmonids are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings. These data should warrant some discussion and analysis in this context, insofar as WDFW is relying on studies in “other areas” to support the assertion that it can successfully minimize adverse impacts to listed populations by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

The response makes a reasonably strong case that temporally and/or spatially segregating hatchery juveniles from listed juveniles can reduce or minimize competition-impacts to listed juveniles in freshwater habitats. However, the response rather overstates the conclusiveness of the evidence presented to support the assertion that wild and hatchery juveniles are being effectively segregated by the release strategies described in this and other HGMPs currently available for public review. The response acknowledges uncertainty about the level of interactions

between hatchery and wild juveniles in the Columbia estuary, and about the consequences of those interactions.

The response acknowledges a high likelihood of interactions between hatchery smolts and listed juvenile steelhead and coho. Table 6 shows that steelhead swim-up takes place directly before planned hatchery releases and will be present in sizes at the border of prey-size for hatchery smolts by WDFW's standard, and well within likely prey-size by other potentially more appropriate standards. No information is provided on the in-basin production of wild listed steelhead fry, relative to the 5,000,000 hatchery chinook-smolts (and the sum of all other hatchery releases in the basin), in order to evaluate the likely scope of potential competitive or predation interactions. The response ignores the potential for encounters with listed juveniles of other ESUs that may be rearing and/or migrating in the mainstem Columbia or its estuary, even though it acknowledges that encounters with LCR chinook, LCR coho, and LCR steelhead could occur in the Columbia mainstem. The admission that "it is unknown to what extent listed fish are available both behaviorally or spatially on the migration corridor" underscores the necessity of considering ecological impacts to other ESUs in the migration corridor, given the admission early in the response that "salmon and steelhead feed actively during their downstream migration."

The response acknowledges a high level of scientific uncertainty regarding the frequency of competitive interactions between hatchery and wild juveniles, and in determining the consequences of those interactions. But the reaction to that uncertainty is inappropriate.

When faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from data gaps or uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- assumptions should be employed that risk over-estimating rather than under-estimating the level of take. The estimation process ought to be more concerned with providing reasonably low probability of making a Type II error than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no or little take. The HGMP is simply more concerned about wrongly over-estimating a level of take than it is with failing to guard listed juveniles against a credible risk. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

While the HGMP makes a reasonable case that evidence exists to suggest that impacts from competitive interactions between wild and hatchery juveniles are difficult to quantify, it fails to make a compelling case that these risks can be dismissed.

In identifying and analyzing risk factors for competition and predation, the response fails to adequately address several relevant issues. Both competition and predation are dependent upon the relative sizes of the individuals involved and

hatchery smolts are generally released at sizes significantly larger than wild juvenile con-specifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. The relative sizes of released hatchery smolts and wild listed juveniles should be specified and then evaluated with respect to potential levels of competition and predation. While the response provides some of this information, it fails to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume (or imply) that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes are needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response is significantly weakened by its failure to include evaluations of the likelihood of competitive interactions with juvenile salmon and steelhead from the Mid Columbia River steelhead, Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. For instance, evaluation of risks to listed fish from predation focuses its analysis on the likelihood of interactions and relative body size between program releases and LCR chinook, coho, and steelhead in the “Kalama subbasin and Columbia mainstem.” This leaves too many significant issues completely unevaluated. For instance, how will the relative body size of listed chinook, coho, chum, and steelhead juveniles likely to be rearing and/or migrating in the lower mainstem Columbia or its estuary during the period that program releases will be outmigrating bear on predation and/or competition impacts attributable to the program?

The risk of take from potential genetic impacts should be analyzed in the context of hatchery releases. The simple fact is that the “constant” annual release of 5,000,000 unmarked, unmonitored juvenile hatchery fall chinook into the Kalama River since the early 1990s (the latest stage in a legacy of releases over a century old) has resulted in a broodstock of an unknown ratio between NORs and HORs (or even basic life-history types), an estimated rate of 80% HORs among natural spawners, and a native, locally adapted wild stock that “no longer exists.” On their face, these circumstances do not clearly justify continuing the program. First, while the actual status of the “distinct” local population is likely critical, WDFW should provide more evidence to support an assertion that the stock is extirpated. Second, whatever the biological status of the naturally spawning population, the NORs in that

population are listed, and the HORs are not. Will any reasonable attempt to integrate hatchery and natural fall chinook production in the Kalama continue to tolerate the amount of gene flow likely to occur with a rate of 80% highly domesticated HORs in the naturally spawning population? Does WDFW have any information about the existing “composite production” stock’s natural productivity relative to the productivity of the original, locally adapted stock it displaced? The HGMP acknowledges the urgent need to mark hatchery releases, but it does not discuss how those marks will be used to implement direct management actions designed to keep gene flow within acceptable limits, or what those limits will be. Sufficient evidence exists to also suggest that HORs from the proposed program could be straying to natural spawning areas both within and among subbasins in the Columbia Watershed. The HGMP acknowledges as much in Section 6.2.1 (“strays from other hatcheries within this GDU are common”). The potential for spawning interactions between program HORs and wild listed chinook in Columbia River tributaries within the LCR ESU should be evaluated.

Response: Comment noted. Fish are reared to a size that significantly contributes to smolt success and are released at a period in June when many listed fish (zero age class) have reached a size potential to avoid being prey. This June release period is later than the listed chum release programs in the Columbia system (see Chun HGMPs). Paramount to emigration is to get fish to a size and time that will allow them to clear the watershed quickly. Listed steelhead spawning and rearing habitat initially are segregated above the point of Chinook releases and although some natural productivity is possible Kalama Falls, it is quite low for coho and Chinook (EDT 2004). The HGMPs in section 2.2.3 provides much of the same information stated here.

A number of efforts will be on-going to integrate populations (AHA, BRAP and LCFRB Subbasin Planning). All will review the implications and concerns the reader has in these sections.

Comment # 17 Monitoring

Given the uncertainty and difficulty the response acknowledges in determining levels of impact to listed fish from almost all program operations, we are disappointed not to see a discussion of monitoring or evaluation plans designed to fill relevant data gaps in these areas.

Response: Comment noted. WDFW is reviewing current monitoring efforts to prioritize them for Lower Columbia recovery strategies, overlaying assessments for hatchery requirements and incorporating current monitoring into an overall plan.

Comment # 18 Projected Take

No attempt is made to estimate the level of take, yet this is what is explicitly requested in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

“Under the broad definition of ESA, ‘take’ of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When ‘take’ of a listed species is expected in the hatchery operation, the ESA *requires* that a numerical estimate be quantified as best as possible.” (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NOAA, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center’s assistance if necessary in making these critical assessments.

The response regarding contingency planning provides boilerplate assurance (pasted into HGMP after HGMP) that if WDFW monitors any “additional” or “significant” mortality among listed salmonids, it will seek “guidance” and “determine an appropriate plan.” It amounts to little more than a commitment to do something. The term “additional mortality” is meaningless in this context, as the HGMP steadfastly refuses to present any quantitative estimates of current mortality levels from the program. The response should include a list of predetermined management options for response to specific performance indicators regarding levels of take attributable to the program.

Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for reacting to circumstances where impact thresholds are exceeded.

For instance, a suite of potential response-options should be developed for a range of potential circumstances including levels of interaction between hatchery and wild listed-juveniles above or between a series of predetermined thresholds, or levels of

HORs present in natural spawning areas with listed conspecifics above or between a series of predetermined thresholds. Monitoring and evaluations plans adequate to generate, analyze, and act on the relevant data should be developed and described.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data indicating that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Response: Comment noted, additional information would be valuable and will be included where it is critical to the evaluation of the HGMP. Also see response to general comment #3.

Comment # 19 Sections 3.1 and 3.2

As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles in each affected basin or subbasin as well as to the total number of hatchery juvenile releases planned for the whole of the MCR, LCR, and UWR ESUs. It does not seem possible to adequately describe or characterize either the magnitude of a particular hatchery program or its relationship to other management objectives without providing a sense of the scale of the total planned production of hatchery juveniles in the mid and lower Columbia River, relative to the estimated numbers of listed juveniles likely to be present in those same areas.

The responses fail to actually “describe (the) alignment of the hatchery program” with any of the documents, policies, or plans listed, or discuss any “deviations from the plan or policies.” They merely assert that hatchery operations are “consistent” with a list of plans.

WDFW’s own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State. WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP. The HGMP

should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. The ISAB's Review provides an exceptionally valuable blueprint for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, "most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action." In other words, the findings and recommendations of the review should be applicable to most if not all programs throughout the basin. We repeat our recommendation that WDFW align the development of this and all other HGMPs currently available for public review with the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003) See comments on Section 1.16, above.

Response: Comment noted additional information would be valuable and could be provided in the future; also see response to general comment # 4.

Comment # 20 Sections 3.3 and 3.3.1

The response describes lower Columbia River fisheries management processes as thorough, open, inclusive, and effective. It provides little of the information requested by the HGMP Template. The response provides no information about the integration of this hatchery program with the harvest management processes described. The Template requests quantitative evidence of the fishery benefits actually provided by a particular hatchery program, including estimates of future rates, and of harvest impacts on listed fish. The response provides rates of capture for Kalama fall chinook in various fisheries, but it does not discuss the percentage-contribution of program fish to those fisheries. Applying the capture rates to the mean "Total Catch" of 848, the program appears to be contributing an annual mean of 305 fall chinook to BC ocean fisheries, 322 to Alaskan fisheries, 51 to the Washington Coast, and 119 fish to Columbia River fisheries (51 fish are not accounted for in the response). If these numbers are correct, the percentage-contribution of program fish to these fisheries is likely low. The low contribution of the program to Washington Coast and Columbia River fisheries bears some discussion regarding the program's performance in meeting its stated mitigation objectives, and regarding the high ecological risks posed by the program at its current scope.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. After re-reading this section of the HGMP, WDFW believes it has provided the requested information.

Comment # 21 Section 3.4

An estimate of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production should be provided in response to this section. Broad descriptions are provided of major limiting factors to natural production and capacity, and of local and regional efforts to identify and redress limiting factors, but no estimates of natural-production benefits from those efforts are provided. The response describes EDT and its potential applications, but it does not describe how it has been applied in the Kalama Basin or what if anything it has determined.

These factors are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this section is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 22 Section 3.5.

The response acknowledges that “co-occurring natural salmon and steelhead populations in local tributary areas and the Columbia River mainstem corridor areas could be negatively impacted by program fish.” It identifies fish from all Columbia and Snake Basin ESUs as being of “primary concern” in this context. This should be reconciled with other sections of the HGMP (see sections 2.2.1 – 2.2.3). The response asserts, “listed fish can be impacted thru a complex web of short and long term processes and over multiple time periods which makes evaluation of this a (sic) net effect difficult.” As noted above, the admitted difficulty of determining impact levels does not justify giving up the search, or dismissing obvious risks of impacts. The response states, “WDFW is unaware of studies directly evaluating adverse ecological effects to listed salmon.” The statement appears to be a reference to earlier statements that WDFW is unaware of studies directly evaluating adverse ecological effects *from this program* to listed salmon. That is not the relevant issue. The relevant issue is whether or not particular or cumulative risks rise to a level that negative impacts would be likely. In the case of this program, the risks of several types of significant impacts to naturally occurring listed populations would appear to be high.

The list of potential positive impacts from the program include some highly conjectural and controversial items. This review has never before encountered the assertion that “the hatchery program may be filling an ecological niche in the

freshwater and marine ecosystem.” The supposition that, “migrating hatchery fish may overwhelm predator populations, providing a protective effect to the co-occurring wild populations,” has to be weighed against the at least equally plausible conjecture that large, consistent annual releases of migrating hatchery fish attract, maintain, and potentially increase predator populations in areas where they will be likely to encounter listed salmon and steelhead, thereby increasing predation impacts on those listed populations. Evidence surrounding bird-predation of juvenile salmon in the lower Columbia mainstem might support this latter conjecture. WT concurs that nutrient-loading with salmon carcasses can potentially stimulate stream productivity and provide some ecological benefit for several species. But there are risks involved, and at any rate the response does not discuss how the release of smolts with a .05% survival rate will create meaningful, sustainable nutrient distribution throughout the basin.

Response: Comment noted. Current return rates have increased in past years. In many systems where hatcheries are located carcasses are being distributed in upper river sites or tributaries. Although a given year can have a .05% survival rate, fish returns beyond hatchery broodstock needs and interim escapement goals have seen additional fish available for nutrient enhancement or carcass surplus options (food bank).

Comment # 23 Section 4.1.

The response does not adequately describe the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described. The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

Response: Comment noted, additional information would be valuable and could be provided in the future, although important limitations to program goals such as temperature problems are included.

Comment # 24 Section 4.2

The response acknowledges that the Fallert Creek intake is out of compliance with NOAA standards and the fish passage appears to be impeded. Funding has apparently been requested, but the status of the request is not discussed, and no timeline for bringing the facility into compliance is provided.

Regarding water withdrawal and effluent discharge, the response does not describe actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. The NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by

hatchery facility location and operations. Relevant issues regarding effluent discharge that should be addressed in this subsection include: stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.

Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described. The results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters.

Response: The Department of Ecology has regulatory responsibility for implementation of the Clean Water Act in Washington, including the National Pollutant Discharge Elimination System (NPDES). WDFW facilities are typically operated under a general permit for ‘Upland Fin-fish Hatchery and Rearing’. The permit specifies the water quality parameters, sampling protocols, and reporting requirements for each permitted facility. Monthly and annual reports on water quality sampling and the use of chemicals at WDFW facilities are available from the Department of Ecology.

Comment # 25 Section 9.2.10

The HGMP Template indicates that information regarding risks of domestication as well as competition and predation is requested. The references to other sections of the HGMP do not provide the requested information, or do not appear applicable.

A minimally adequate response to this subsection would include a list of hatchery rearing and release practices that are intended to keep potential adverse impacts below a threshold level, a statement of the threshold level(s) and a list of measurable performance indicators relevant to the estimation of adverse impacts, and a statement of the monitoring plan that will be employed to measure the indicators in a timely manner and a statement of management actions that will be taken should monitoring indicate that threshold levels of impact have been attained. We suggest that such details be developed and provided.

Response: Comment noted, the HGMP language states “effect to listed fish under propagation”. Although the hatchery populations are included within the ESU listing, this request pertains to listed fish as the HGMP template was originally formatted for. The risk aversion measures are specific program considerations to minimize impact on listed fish. Threshold adverse levels are not currently known.

Comment # 26 Section 11.1

As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response does little more than very broadly describe the parameters that should be monitored and why. It does not describe how the parameters will be monitored. The response is not presented in the requested format, and does not appear to reconcile with all the performance “standards” and “indicators” presented in Section 1.10 (see comments on Section 1.10).

As noted throughout this review, a monitoring and evaluation plan should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. No monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated*.

In its *Review of Public Comments Received on Puget Sound HGMPs (2003)*, WDFW concurred with public comments that “Detailed description of the monitoring plans and methods related to the performance indicators is not provided,” and pledged to provide “additional details” for PS HGMP monitoring plans during the development of an Environmental Impact Statement on the overall PS hatchery program. Washington Trout submitted significant, substantive comments to WDFW regarding the unacceptable lack of detail in monitoring and evaluation plans in PS HGMPs, largely paralleling the relevant comments in this review. As far as we are aware, the public has not had opportunity to review any “additional details” regarding the monitoring plans for PS hatchery operations. However, this and other HGMPs currently available for review lack any significantly informative descriptions of the monitoring and evaluation plans associated with each proposed program. WDFW has so far failed to clearly demonstrate just how much it concurs with public input regarding this issue.

Response: WDFW concurs and will provide additional details as the HGMPs are augmented during the iterative, ongoing review leading to the distribution of the Final Environmental Impact Statement.

Comment # 27 Section 11.1.2

The response appears to acknowledge that some monitoring activities will be exposed to budget limits. No information is provided about funding status for the initiation of mass marking, despite acknowledgement of urgent need throughout the HGMP.

Response: Comment noted.

Comment # 28 Conclusion

The HGMP unfortunately provides no reason to believe that levels of take of listed species attributable to the proposed program are being or will be effectively contained, or that hatchery benefits justify those impacts. The HGMP commits to NO readily identifiable, measurable, or appropriate performance standards or indicators. It fails to identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The HGMP process offers the opportunity to evaluate several broad factors including: the justification for a particular hatchery program; the social, cultural, and economic benefits of the program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted.

The justification for the program is at best inadequately described. Risks of several types of adverse impacts to listed populations from the program described in this HGMP appear to be high. Measures to minimize take are either inadequately described or based on assertions left unsupported. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

In our judgment, the application is inadequate to justify take authorization under the criteria enumerated in the 4d Rule.

Note:

Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Response: WDFW finds the overall review and responses to many of the HGMP sections to be helpful and informative. Additional assessment of hatchery operations,

environmental impacts with the natural environment and fish would be valuable but are dependent on many factors beyond current hatchery and program capabilities. The current Columbia river system Artificial Production and Review Evaluations (APRE) and HGMP processes are a way to identify funding priorities and needed changes. WDFW will be updating HGMPs in the future and will work with NOAA and the Recovery Boards in order to supply the information as needed.

Klickitat Spring Chinook Production Program HGMP

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Comment # 29 Section 1.6

The response identifies the program as an “Integrated Harvest/Conservation” type. Under definitions provided in the Template, and other responses provided later in the HGMP, the program would appear to be an Integrated Harvest type, as the salmon propagated in the program are intended *primarily* for harvest (see HGMP Template -8/7/02; Attachment 1). By definition, the fish produced by the program cannot be intended *primarily* for two distinct purposes. The HGMP Template and guidance documents provide clear instruction to pick one or the other. The distinction is more than rhetorical. Presumably, relative to take authorization, expected biological benefits would be lower and the standard of justification would be higher for an integrated harvest program than for a recovery or research program, or at least different.

The response states: “The proposed integrated strategy for this program is based on WDFW’s assessment of the genetic characteristics of the hatchery and local natural population, (*sic*) the current and anticipated productivity of the habitat used by the populations.” Details on the methods WDFW employed to make these important assessments, and the actual findings of those assessments, would be helpful in this section.

Response: See previous response to Section 1.6 in general comments.

Comment # 30 Section 1.8

The response appears inappropriate. Guidance from the HGMP Template clearly instructs that responses to this section should indicate *how* integrated harvest programs will be operated to provide fish for harvest “while minimizing adverse effects on listed fish.” This would appear to be the primary purpose for the entire HGMP process for take authorization. As noted in our comments on Section 1.6, under definitions provided by NOAA Fisheries, this particular program would not qualify as a “conservation” (more appropriately “recovery”) program. However, insofar as WDFW attempts to designate conservation as a primary program purpose, it should acknowledge and respond to the Template’s instruction to provide an indication of *how* the program will “enhance or benefit” the target natural population.

Instead, the response begins with a list of legal and administrative mandates for the *purposes* of the program (the list might have been more appropriately included in a response to Section 1.7). WT believes that some of the acts, agreements, and decisions listed are at least ambivalent in regards to mandating this or any

particular hatchery program. It is entirely plausible that several of these mandates could be satisfied by any number of other approaches. Why is it socially, economically, biologically, or even legally necessary or advisable to satisfy these mandates using this program at this facility? There may be several and varied justifications for meeting these mandates through the Klickitat Spring Chinook Production Program, but they should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program. The response should describe why it is necessary to produce, rear, and release spring chinook under the *specific* protocols proposed – again, in order that such justification can be weighed against the risk of potential take that may occur, relative to other options, including modifying, scaling back, replacing, or even discontinuing the program.

At any rate, this list of purported mandates does nothing to describe *how* the program will minimize adverse impacts on listed populations, or *how* it will benefit the target natural population (or indeed, *how* it will satisfy the listed mandates!). At least, the level of performance relative to the listed mandates should be described in detail in order to justify any biological risks of the program to listed Mid Columbia River steelhead, Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing) and Columbia River Chum. (While the Klickitat River is technically outside the LCR chinook, steelhead, coho, and CR chum ESUs, it's close proximity to the border of those ESU's, and the likely geographical and temporal scope of various hatchery-impacts should require examination of potential and likely impacts to those listed populations and an assessment of the appropriateness of take authorization relative to those impacts.) While the response includes skeletal information about the legal, social, and political obligations of the program, and provides a cursory identification of some affected stakeholders, it fails to explain the program's success at providing any expected mitigation or other benefits, and does not supply any quantitative or even qualitative estimates of the economic or social activity that can be directly attributed to the program.

WDFW appears to assume one or both of two things: that because some or all of the listed mandates predate the listing of the relevant ESUs, the “benefit” of raising fish for harvest in the program has already been established, and should not require detailed explication; or that the mere assertion that the existing program is (or will be) “the principal means of protecting, mitigating, and enhancing the anadromous fish populations in the Yakima and Klickitat subbasins, ” is adequate to justify the program. Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of relevant 4d Rules and the HGMP template.

At any rate, the response lacks detail sufficient to assure that the program will indeed protect, mitigate, and enhance anadromous fish populations in the Klickitat subbasin. In order to meet the HGMP requirement to adequately describe *how* the program will accomplish these goals, measurable, quantitative standards that provide clear threshold levels of benefits to be achieved and potential adverse

impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Table 1 describes aspects of program operations that are intended to reduce risks of potential adverse impacts on listed fish. However, the table is confusingly labeled as a “Summary of risk aversion measures for the Klickitat *Coho* program” (emphasis added). If this is simply a typographical error, it should be corrected before the HGMP is submitted to NOAA Fisheries for review. If it is indeed a summary of measures proposed for an entirely different program, its relevance should be more clearly explained.

Unfortunately, confusing labeling or potential irrelevance is not the only weakness with the table. Primarily, the table only addresses a few selected risk factors; it does not address potential genetic impacts on LCR (or other) chinook populations, potential migration or other behavioral impacts on LCR (or other) chinook populations, or potential harvest impacts on relevant listed populations associated with harvest activities targeting spring chinook produced by the program, to name just a few. It does not actually describe in any meaningful way actual risk aversion measures. At best, it describes authorities and/or documents that could govern potential risk aversion measures. In some cases it appears only to describe what risk aversion measures are necessary.

References to other sections in the HGMP provide little clarification. Neither the table nor the references include or refer to appropriate measurable quantitative standards, and/or rely on dubious or unjustified assumptions and assertions about the sources of adverse impact and how they may best be minimized. The table itself and the information provided in the relevant HGMP references are repeated (often *verbatim*) without extensive case-specific qualifying information in nearly every HGMP. In some cases, program and/or species names are inappropriate to the specific HGMP, clearly indicating a cut-and-paste approach, and a sloppy one at that. It is frankly hard to escape the impression that WDFW does not take this particular ESA-related responsibility as seriously as it should. Boilerplate assertions are not an adequate substitute for honest, thoughtful, specific analyses of individual WDFW hatchery programs and their potential harmful impacts on listed salmon and steelhead populations.

Table 1 references Section 7.9 of the HGMP to provide explication of “Risk Aversion Measures” relative to the “Potential Hazard” associated with Broodstock Collection and Adult Passage. In Section 7.9, NOAA queries applicants: “Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.” WDFW’s response includes the following broad assertion: “Every effort shall be made to promote local adaptation of this spring chinook population and out of basin hatchery transfers of eggs or fish for use as broodstock will only be considered in extreme cases.” While this response may indicate good management-intent (an impression weakened by the same boilerplate response

included verbatim in HGMP after HGMP), it is entirely too vague to provide any explication of the specific “Risk Aversion Measures” the program will undertake to avoid relevant potential hazards. A detailed description of *any* of the proposed “efforts” is entirely lacking. How does WDFW define “local adaptation,” and how will it be promoted? What exactly will qualify as “extreme circumstances” that would prompt WDFW to consider out of basin hatchery transfers of eggs or fish?

This unacceptable lack of detail continues throughout the response. What leads WDFW to “presume” that natural spring chinook spawn up/downstream of the hatchery, and how does that presumption qualify as a risk aversion measure (particularly as the most relevant natural listed population in this specific case is MCR steelhead)? How effectively will the program limit take by identifying and immediately releasing non-target listed fish? How exactly will non-target fish be sorted from the holding pond, handled, and released? Can WDFW provide any estimate of expected mortality or decreased spawning success attributable to those encounters, as brief as they may be?

The response to Section 7.9 includes no information regarding adult fish passage. (Interestingly, the response to Section 7.2 – describing broodstock-collection design – mentions that the “river does not have a weir,” which is apparently presumed to avoid unintentional collection of NORs. This is confusing relative to the admission in Table 1 that “The hatchery weir and associated intake facilities need repairs to provide compliant passage.”)

To provide explication of measures WDFW will employ to avoid potential risk associated with competition and predation, Table 1 references Sections 2.2.3 and 10.11 of the HGMP. Section 2.2.3 presents a relatively thorough attempt to support WDFW’s assertion that competition and predation impacts can be minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response to Section 2.2.3 still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds these issues. (See comments on Section 2.2.3.)

The response to Section 10.11 suffers from many of the same weaknesses repeated throughout the HGMP, insufficient detail and support for the broad assertions presented, information contradicted in other sections of the HGMP, a lack of case-specific information and analyses, and no acknowledgement or evaluation of likely risks to neighboring ESUs.

Guidance from NMFS on completing the HGMP Template directs applicants to “cite relevant reports... or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP,” and to “provide additional support of critical information” submitted in the HGMPs. WDFW provides no citations or documentation to support many of the assertions made in the response.

The HGMP should at least attempt to quantify the level of take managers would expect when program operations are configured to “minimize impacts on listed fish.” What is the target level of “minimized” impact? In its January 5, 2000 guidance document (*Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions*), NOAA Fisheries clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible” (paragraph G).

We are aware that in its response to public comments regarding Puget Sound HGMPs, WDFW asserted it was under no obligation to provide take estimates in this context. WT frankly disagrees. We find WDFW’s citation in support of this assertion at best inapplicable (WDFW clearly does have the capability to provide *some* reasonable numerical estimate of potential impact from at least several aspects of its hatchery operations). At any rate WDFW’s response does not reconcile with the unambiguous guidance provided in the January 2000 document, still referenced by NOAA Fisheries on its HGMP Template web page as providing “important instructions for the completion of an HGMP.” (<http://www.nwr.noaa.gov/1hgmp/hgmptmpl.htm>)

In sum, it appears that the response to Section 1.8 is *inadequate* to meet the requirements of the HGMP Template. As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. The significant shortcomings in this response alone would appear to render this HGMP application inadequate for federal approval.

Response: Refer to general comment number five “Failure to examine credible alternatives.

Comment # 31 Sections 1.9 and 1.10

The Tables on pages 5 - 6 listing Performance Standards, Indicators, and Monitoring and Evaluation measures in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. The exact same tables are presented in nearly every HGMP currently available for public review. Taken by themselves the tables do not comply with the guidance provided in the HGMP Template to provide standards that are “*measurable, realistic, and time specific*” (emphasis added), and to provide indicators that identify “*specific*

parameters to be monitored and evaluated.” (Emphasis added.) The repetition of this inadequate response throughout the HGMP package suggests an attempt to avoid thorough, case-specific analyses of the risks to listed salmon and steelhead populations presented by WDFW hatchery programs, and/or the specific measures that could potentially eliminate, minimize, or even evaluate those risks.

The tables presented in Section 1.10 are each designated as applicable to either “benefits” or “risks” per Template instructions. In general, the table listing performance standards and indicators for “benefits” comes closer to meeting the Template requirements, insofar as the standards listed correspond to samples provided in the NPPC *Artificial Production Review*. However, in most cases the Indicators listed do not reach the level of measurable specificity directed by the APR.

For instance, the table identifies the following standard: “Assure that hatchery operations support Columbia River fish Mgt. Plan (*US v Oregon*), production and harvest objectives.” This appears to adequately correspond to the following sample provided in the APR: “Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.” (The caveat of “avoiding overharvest of non-target species” is addressed in the following table; see below.) However, the corresponding Performance Indicators do not reach the level of specificity provided in the APR samples:

- *Indicator:* Annual number of fish produced by this program caught in all fisheries, including estimates of fish released and associated incidental mortalities, by fishery.
- *Indicator:* Annual numbers of each non-target species caught (including fish retained and fish released/discarded) in fisheries targeting this population.
- *Indicator:* Recreational angler days, by fishery.
- *Indicator:* Annual escapements of natural populations that are affected by fisheries targeting program fish.
- *Indicator:* Catch per unit effort, by fishery.

This higher level of specificity is required in order to *adequately* judge how the program performs relative to objectives and applicable mandates, and to weigh the relative value of that performance against negative impacts to listed stocks that may occur. It is not credible that WDFW would not have this information available. (In the context of the HGMP Template, the *actual numerical estimates* corresponding to these sample indicators should be provided: i.e., “*Indicator:* 174 Klickitat-Program spring chinook harvested; 87 tribal; 45 non-tribal commercial; 42 non-tribal recreational; etc.” This is implicit in the guidance provided in the APR.)

The performance indicator provided is derived from a table provided in response to Section 1.12, reporting “current” program performance. It does not seem appropriate to merely tally up past program performance – not apparently related

to any particular goal at all – and simply declare it an acceptable performance indicator for future program operations, particularly when that performance appears to be low both objectively and relative to stated program goals. Expressing the indicator as a total of “harvest plus escapement” masks an apparently low contribution to total catch rates, an average of 174 chinook. There is no accompanying discussion of how adequately these numbers “support” harvest or mitigation objectives, or how such a contribution to sport, tribal, and commercial fisheries can be considered at all “meaningful.” Indeed, the way the numbers are presented in the performance table creates the impression that the program’s contribution to harvest objectives is higher than it actually is.

The listed Performance Standard, “Program contributes to fulfilling tribal trust responsibility mandates and treaty rights” corresponds adequately to a relevant sample provided in the APR. However, the corresponding Performance Indicator is *not* an indicator (it really does nothing more than restate the standard), and does not even approach the measurable specificity of the samples provided in the APR:

- *Indicator:* Total number of fish harvested in tribal fisheries targeting this program.
- *Indicator:* Total fisher days or proportion of harvestable return taken in tribal resident fisheries, by fishery.
- *Indicator:* Tribal acknowledgment regarding fulfillment of tribal treaty rights.

(Again, terms like “Total number” and “Total fisher days” should be replaced by *actual numerical estimates*.)

The listed Performance Standard, “Region-wide, groups are marked in a manner consistent with information needs and protocols to estimate impacts to natural and hatchery origin fish” corresponds adequately to a relevant sample provided in the APR. (However, some description of the relevant “information needs and protocols” would be helpful.) But again, the corresponding Performance Indicators are little more than a restatement of the standard, and do little to identify any “specific parameters to be monitored” (HGMP Template), or provide “measurable metrics that bear directly on the quantitative determination as to whether or not the standard is being met” (*Artificial Production Review*; p 3). We include the following examples from the APR for comparison:

- *Indicator:* Marking rate by mark type for each release group.
- *Indicator:* Sampling rate by mark type for each fishery.
- *Indicator:* Number of marks of this program observed in fishery samples, and estimated total contribution of this population to fisheries, by fishery.

(Again, terms like “Marking rate,” “Sampling rate,” “Number of marks,” and “estimated total contribution” should be replaced by *actual numerical estimates*.)

The table does not include relevant performance standards/indicators for potential benefits associated with every purpose, goal, and/or justification of the program presented in sections 1.6 – 1.8. The APR provides sample performance standards and corresponding performance indicators for mitigation requirements, conservation of wild/naturally spawning populations, and socio-economic effectiveness (see *Artificial Production Review*; pp 6-19). None of these are included in the table. If nothing else, this illustrates an inherent weakness and inefficiency in WDFW’s “one size fits all” cut-and-paste approach to the development of the HGMPs currently available for review.

The “risks” table is even less adequate for the purposes of take authorization. “Minimize impacts and/or interactions to ESA listed fish” is not a bone fide standard, but at best is a program goal. The APR defines a performance standard as, “a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met.” (Emphasis added.) There is nothing quantifiable in this purported “standard,” and it is described in a way that actually makes it *impossible* to determine whether or not it is being met. What is meant by “minimize?” Will impacts be minimized relative to current levels, or some otherwise determined unacceptable level? What are those levels? How were they identified and/or determined? Exactly which impacts and/or interactions will be minimized, and how will that minimization be achieved? How will compliance with this “standard” be judged?

The APR provides a range of performance standards/indicators that would be pertinent to the goal of minimizing impacts and/or interactions to ESA listed fish:

- Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population.
- Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of the population from which broodstock is taken.
- Broodstock collection does not significantly reduce potential juvenile production in natural rearing areas.
- Life history characteristics of the natural population do not change as a result of this artificial production program.
- Annual release numbers do not exceed estimated basin-wide and local habitat capacity, including spawning, freshwater rearing, migration corridor, and estuarine and nearshore rearing.
- Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.
- Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.
- Artificially produced origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning population.

- Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.
- Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally produced population.
- Weir/trap operations do not result in significant stress, injury, or mortality in natural populations.
- Predation by artificially produced fish on naturally produced fish does not significantly reduce numbers of natural fish.

(Note: We acknowledge that not all of these standards would be specifically applicable to this particular program in this particular ESU. However, we do believe that WDFW has been inappropriately dismissive of the potential genetic and ecological impacts of this program to other listed populations in bordering ESUs [see comments on Sections 2.2 – 2.2.2], and given the verbatim repetition of this table in nearly all the HGMPs currently available for public review, we wish to make these comments as broadly applicable to every HGMP as possible.)

The performance indicators provided in the table fail to meet a level of specificity to qualify as actual indicators. As in the Benefits table, they are generally no more than restatements of the purported standards, or at best lists of possible parameters that could serve as indicators, if they were adequately monitored (and described in measurable terms). Few of the items listed under the heading Performance Indicator are clearly stated as a measurable indicator.

The Monitoring and Evaluation Plans corresponding to the standards and indicators presented in the two tables contain no measurable criteria and no specific descriptions of actions associated with attempts to measure either fishery benefits, or impacts of hatchery releases on listed populations.

For instance, the Monitoring and Evaluation Plan corresponding to the purported standard of minimizing impacts to listed fish includes the statement: “instream evaluations of... NOR/HOR ratio on the spawning grounds.” A mere statement that NOR/HOR ratios of adults will be “evaluated” fails to specify a number for an acceptable target-ratio, much less how such a ratio is to be estimated and where and when it will be measured. An adequate Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish. (An actual performance indicator associated with such monitoring plan might be “the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%.”)

For the purported standard, “Harvest of hatchery-produced fish minimizes impact to wild populations,” no adequate indicators are provided, except in the most general terms (see comments on “benefits” table, above, for samples of more

appropriate performance indicators). Likewise, the description of the corresponding monitoring and evaluation measures, “harvests are monitored by agencies and tribes to provide up to date information” provides little useful information. An adequate monitoring plan for these standards and indicators would at very least describe the methods by which catch will be monitored and survival rates estimated.

The failure to adequately respond to this section is acutely disappointing, given WDFW’s response to comments regarding this exact failure in the Puget Sound HGMPs made available for public review in summer 2003. In that response (WDFW; 2003), WDFW offered to revise those HGMPs to “provide *specific, numeric* performance measures for key program characteristics.” (Emphasis added.) As far as we know, the public has not been given opportunity to evaluate whether or how thoroughly those revisions have been completed, but the failure in this round of HGMPs to provide anything approaching quantifiable performance standards or include any measurable metrics as performance indicators is far from encouraging in this regard.

Response: Refer to general comment number one: “Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables”.

Comment # 32 Section 1.11.2.

The response identifies the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NOAA Fisheries or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur, in the Columbia mainstem, and in the associated estuary and nearshore environments. Some scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of Columbia-wide hatchery releases on listed fish.

We recommend that in addition to listing specific hatchery-program releases, an estimate also be made of the total numbers (by species) of hatchery salmonid juveniles that will be released in the basin, as well as the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating through and out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the Mainstem Columbia between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the Columbia estuary and associated nearshore environments, and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles

proposed to be released by the facility for which the HGMP is written can provide NOAA Fisheries and the public with the appropriate sense of the expected size of the program, and its potential contribution to cumulative impacts on all relevant listed populations from WDFW hatchery programs overall.

Response: WDFW agrees that this information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 33 Section 1.12.

The response provides data on smolt-to-adult survival rates, catch- levels, and escapement levels, though no numbers appear to be provided for total adult production levels No discussion or analysis accompanies the data reported. The average smolt-to-adult survival rate for the brood years 1990 – 1998 appears to be slightly less than .23%, varying from a low of .01% (1994) to .62% (1998). No discussion accompanies this to indicate whether these survival rates are acceptable, expected, or a matter of concern, despite clear guidance in the HGMP Template to provide program goals for these parameters.

Inssofar as the HGMP proposes to use the average of past program SAR and harvest rates as acceptable performance indicator for future program operations (see Section 1.10), it has an obligation to discuss the relationship of past performance to past goals. Mean performance appears to be low both objectively and relative to stated program goals. Total contribution to harvest between 1993 and 2001 never exceeds 415 fish, and ranges as low as 33 fish, for an average of 174 over nine years and a total over that period of 1,565 fish. Some discussion is due of how these numbers have and will meet stated program objectives to support meaningful harvest or meet mitigation requirements. The HGMPs proposes to integrate the hatchery and natural populations in the subbasin. It seems that some discussion is warranted regarding whether it is appropriate to integrate a hatchery population with such a low smolt-to-adult survival rate into an already depressed, listed, natural-spawning population. While an SAR rate of .23% may be adequate for a hatchery population that experiences egg-to-emergence survival above 80%, it would certainly not sustain a naturally reproducing population that must tolerate egg-to-emergence survival as low as 10%.

(Further, the table is confusing to this review. No column provides total adult production levels, so we assume that the sum of “Total Catch,” “Spawning Ground Escapement,” and “Hatchery Escapement” equals total adult production for each of the listed Return Years. However, this is not entirely clear because “Spawning Ground Escapement” is not identified as HORs, NORs, or a combination of the two. The HGMP instructs applicants to include estimates for hatchery escapement to “natural areas.” The benefit of the doubt would incline us to assume that “Spawning Ground Escapement” represents HORs on the natural spawning areas, though it is unclear how such an estimate would be made, since mass marking did not apparently begin until the 2000 brood year. It is not identified which return year corresponds to which brood year for determining smolt to adult survival. At any

rate, summing up either “Total Catch,” “Spawning Ground Escapement,” and “Hatchery Escapement,” or “Total Catch” and “Hatchery Escapement” for any particular return year, and dividing by the annual release goal of 900,000 [or alternatively 600,000] will not consistently render a survival-percentage estimate that matches any presented in the table. It is possible that release goals were not met for some or all of the brood years, but if that is true it should warrant some discussion in this context as the brood take goal of 500 appears to have been fairly consistently met throughout the period. A clearer indication of total adult production is needed, with a clearer indication of each return year’s corresponding brood year. Perhaps some of this confusion could be remedied by merely referencing the source of the data, as instructed by the HGMP Template.)

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

- Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
- The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
- Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates: A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.
- In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local

in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Response: WDFW agrees that additional information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 34 Section 1.16.

The response is confusing, inappropriate to the query, and apparently incomplete. The “key issues” summarized in the response are not obviously relevant, and the very brief summaries of “alternatives” only restate aspects of the program proposal described in other sections of the HGMP. The cursory descriptions of “potential reforms and investments” are obviously incomplete, and their relevance to an examination of actual program alternatives is not at all clear. The table ending the response and its accompanying text appears to be a broad statement of hoped-for project outcomes for the target stocks. It is vague, confusing, offers no definition of terms or how the listed determinations were made, and at any rate does not address in any way alternatives to the program except to imply that “other strategies” will augment the hatchery program.

The HGMP Template clearly requires that if clear *alternatives to the proposed program* were considered that could potentially meet stated program goals or reduce program impacts, they be described and “reasons why those actions are not being proposed” provided. If none were considered, a discussion regarding the reasons for that decision should be warranted.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates attributable to the program within the basin and neighboring basins are determined to be within

the Wild Salmonid Policy guidelines; 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. One of the ISAB's key findings was an urgent need to develop "robust experiments with *unsupplemented* reference streams" (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin. NOAA Fisheries' Salmon Recovery Science Review Panel issued a report of Panel meetings held July 2003, to discuss "how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations" and to "urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units."

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, "most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action." The RSRP found "an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation." In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW's response to public comments, as well as NOAA Fisheries' review of submitted HGMPs.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River in Puget Sound provide an example for

consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1994-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, coupled with relatively intensive habitat protection and recovery, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Response: Refer to general comment number five “Failure to examine credible alternatives”. Both current goals and justification of the existing programs in the Lower Columbia were the result of mitigation for dams. With ESA listings in 1998, WDFW is examining alternatives for integrating the current population to contribute to recovery. Increased assessments, monitoring and recommendations: “*Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003)”, will be used in future decisions.

Comment # 35 Section 2.2.1

This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe: “adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing.” The response does not address, let alone emphasize, “spatial and temporal distribution relative to hatchery fish release locations and weir sites.”

If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

In Addition to Mid Columbia River steelhead and Columbia Basin DPS bull trout, the HGMP should examine the potential for impact from this proposed program to listed populations of salmon and steelhead in the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. The HGMP Template instructs applicants to identify all listed populations that may be incidentally affected by the program, including all listed populations in the proposed program’s juvenile-release and adult-return areas.

Hatchery-release areas would include at least all freshwater, estuarine, and nearshore marine environments where hatchery juveniles would be expected to pass through and potentially commingle, interact with, and impose ecological impacts on listed fish. In this case, The HGMP appropriately acknowledges those areas would include the mainstem of the Klickitat and the mainstem of the Columbia, its estuary, and associated nearshore environments. Adult-return areas would include at least all estuarine and freshwater areas where HORs of this proposed program would be expected to pass through and potentially impose ecological impacts on listed fish, or where they might be expected to stray to and interact with listed fish on natural spawning areas, potentially imposing ecological and genetic impacts on listed fish. In this case those areas would include the mainstem of the Columbia and its estuary down stream of the Klickitat and tributaries of the Columbia between its estuary and the mouth of the Klickitat. Listed fish from the above-named ESUs will be present in all these areas and “may be incidentally affected by the program.”

HOR straying within and among sub basins in the Columbia Basin is well documented. The Mouth of the Klickitat is very close to the geographic border of

the lower river ESUs. Out migrating hatchery juveniles released from the program and HORs returning to the program will pass through the entire length of the mainstem Columbia portion of the lower river ESUs.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. The status of the current listings (proposed) include the hatchery population and available status information accompanies both. Information throughout the HGMP describes hatchery release locations and weir sites. Other sections throughout the HGMP (2.2.3) attempt to describe both spatial and temporal distribution. The potential negative impact for all Columbia ESUs are contained in section 3.5 (Ecological Interactions).

Comment # 36 Section 2.2.2

The response should include appropriate descriptions of the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. The status descriptions provided for affected MCR steelhead and CB bull trout populations acknowledge that the information requested in this section is not available for those ESUs. Without estimates of annual juvenile production and basin capacity, the HGMP cannot provide an accurate description of the scale of proposed hatchery-releases relative to the production and capacity of listed fish in the basin or basins. In addition to MCR steelhead and CB bull trout, the HGMP should provide the relevant estimates for affected populations in the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. Estimates should also be provided for total hatchery releases likely to be present in the relevant areas of the Columbia mainstem, so the proposed program's contribution to the overall scale hatchery releases in the mid and lower Columbia basins can be evaluated.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. NOAA's cumulative effects analysis will be evaluating this.

Comment # 37 Section 2.2.3.

The response presents a relatively thorough attempt to describe program activities that may impact listed populations, and the risks of those impacts. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds some of these issues.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 38 Rearing Program

The response acknowledges that the water-intake facility is out of compliance with NOAA fish screening standards. The HGMP states that funding has been requested for “scoping, design, and construction” to bring the facility into compliance, but no information is provided indicating the amount of the request, how long it has been pending, or what its current status is. No time estimate is provided for bringing the facility into compliance with NOAA standards.

No information is provided about fish-passage, even though Table 1 in Section 1.8 acknowledges that “the hatchery weir and associated intake facilities need repairs to provide compliant passage.”

The response includes information about water quality permitting and monitoring, but none about applicable water-quality standards or program performance relative to those standards or any other conditions of the relevant permits. The types or amounts of effluent discharged from the hatchery facility are not listed. The response could include a higher level of transparency on this issue than a referral to another agency.

Information about disease transfer is vague, if not to say unsettling. The “significant” consequences of outbreaks are described, but little useful information is provided regarding the history of or potential for disease transfer at this facility, other than cryptic indications of “greatly improved” health conditions and success at “reducing” disease outbreaks. What are the pathogens involved? How often have disease outbreaks occurred? What were the consequences? If performance in this regard has improved, by what measure, by how much, and for how long?

Response: WDFW agrees that more information is valuable and may be added in the future. Concerns such as disease are covered in other parts of the HGMP, such as in Section 9.2.7. Effluent monitoring reports can be requested through the NPDES permitting system.

Comment # 39 Release Program

The response provides relatively detailed information intended to support WDFW’s assertion that competition and predation impacts can be effectively minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. However, the response is weakened by a reliance on some unsupported and sometimes contradictory assumptions, its failure to consider impacts to neighboring ESUs, and its inappropriate reaction to uncertainty.

The response states, “planting of Klickitat Hatchery spring Chinook occurs in March. Fish are released at a time, size and condition factor that indicates a high level of smolting and are expected to emigrate quickly to minimize density-dependent effects on listed fish.” The response acknowledges that “Salmon and steelhead feed actively during their downstream migration (Becker 1973; Muir and Emmelt 1988; Sager and Glova 1988) and if they do not migrate they can compete with wild fish,” but then presents information and references to support the assertions that wild and hatchery juveniles are effectively segregated by some behavioral and habitat-preference differences between hatchery and wild juveniles, and “rapid” downstream migration of hatchery juveniles released as smolts.

The response states that, “WDFW is unaware of any studies that have empirically estimated the competition risks to listed species posed by the program described in this HGMP.” This statement is repeated or paraphrased several times throughout the response and in nearly every HGMP. In fact the bulk and substance of the response is repeated essentially verbatim in nearly every HGMP. In the absence of such a narrow study, the HGMP invests a high degree of confidence in “studies conducted in other areas (that) indicate that this program is likely to pose a minimal risk of competition.” At best the referenced studies “suggest” support for the relevant assertion; they do not “indicate” anything in this context. But never mind semantics; without due consideration of studies in “other areas” that may suggest a potential for more than “minimal” competition-impacts from the proposed program, WDFW’s value-standard risks a bias toward particular assumptions about program performance.

Releasing hatchery juveniles in March to temporally segregate the release from wild-juvenile emigration in order to minimize potential adverse interactions implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to temporally segregate them from all wild emigration unless hatchery releases occur in late July. This also dismisses the likelihood of hatchery juveniles interacting with rearing juveniles of listed populations that employ life-history strategies that include multi-year freshwater rearing.

The response relies on findings in Flagg et al that “it is unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the estuarine environment.” But it apparently ignores current work in Puget Sound that strongly suggests hatchery and wild juvenile salmonids are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data should warrant some discussion and analysis in this context, insofar as WDFW is relying on studies in “other areas” to support the assertion that it can successfully minimize adverse impacts to listed populations by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

The response makes a reasonably strong case that temporally and/or spatially segregating hatchery juveniles from listed juveniles can reduce or minimize competition-impacts to listed juveniles in freshwater habitats. However, the response rather overstates the conclusiveness of the evidence presented to support the assertion that wild and hatchery juveniles are being effectively segregated by the release strategies described in this and other HGMPs currently available for public review. The response acknowledges uncertainty about the level of interactions between hatchery and wild juveniles in the Columbia estuary, and about the consequences of those interactions. The assertion that hatchery smolts released in March are unlikely to encounter listed MCR steelhead in the Columbia mainstem is completely unsupported, and ignores the potential for encounters with listed juveniles of lower-river ESUs that may be rearing and/or migrating in the mainstem Columbia or its estuary, underscored by the admission that “it is unknown to what extent listed fish are available both behaviorally or spatially on the migration corridor.” The statement that “competition with listed steelhead smolts would be unlikely as both stocks would be actively migrating” seems to contradict the

admission early in the response that “salmon and steelhead feed actively during their downstream migration.”

The response acknowledges a high level of scientific uncertainty regarding the frequency of competitive interactions between hatchery and wild juveniles, and in determining the consequences of those interactions. But the reaction to that uncertainty is inappropriate.

When faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from data gaps or uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- assumptions should be employed that risk over-estimating rather than under-estimating the level of take. The estimation process ought to be more concerned with providing reasonably low probability of making a Type II error than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no or little take. The HGMP is simply more concerned about wrongly over-estimating a level of take than it is with failing to guard listed juveniles against a credible risk. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

While the HGMP makes a reasonable case that evidence exists to suggest that impacts from competitive interactions between wild and hatchery juveniles are difficult to quantify, it fails to make a compelling case that these risks can be dismissed.

In identifying and analyzing risk factors for competition and predation, the response fails to adequately address several relevant issues. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. This requires, at a minimum, that the relative sizes of released hatchery smolts and wild listed juveniles be specified and then evaluated with respect to potential levels of competition and predation. The response makes a limited attempt to provide this information. However, it presents relative size estimates for only one affected population, MCR steelhead, and ignores the potential for impact to other listed populations. Moreover, it fails to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume (or imply) that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes is needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response is significantly weakened by its failure to include evaluations of the likelihood of competitive interactions with juvenile salmon and steelhead from the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. For instance, evaluation of risks to listed fish from predation focuses its analysis on the likelihood of interactions and relative body size between program releases and MCR steelhead in the Klickitat Basin. This leaves too many significant issues completely unevaluated. For instance, how will the relative body size of listed chinook, coho, chum, and steelhead juveniles likely to be rearing and/or migrating in the lower mainstem Columbia or its estuary during the period that program releases will be outmigrating bear on predation and/or competition impacts attributable to the program?

Because the HGMP only evaluates impacts to MCR steelhead, it assumes no need to analyze the risk of take from potential genetic impacts. Sufficient evidence exists to suggest that HORs from the proposed program could be straying to natural spawning areas both within and among subbasins in the Columbia Watershed. The HGMP for the Kalama River Fall Chinook Program acknowledges as much in Section 6.2.1 (“strays from other hatcheries within this GDU are common”).The potential for spawning interactions between program HORs and wild listed chinook in Columbia River tributaries within the LCR ESU should be evaluated.

Response: Comment noted. Fish are reared to a size that significantly contributes to smolt to adult survival success and are released at a time that fosters rapid migration. Paramount to emigration is to get fish to a size and time that will allow them to clear the watershed quickly. Listed steelhead spawning and rearing habitat initially are segregated temporally. Section 2.2.3 provides much of the same information stated here.

A number of efforts will be on-going to integrate populations (AHA, BRAP and LCFRB Subbasin Planning). All will review the implications and concerns the reader has in these sections.

Comment # 40 Monitoring

The response acknowledges that “data are not available to accurately estimate annual escapement or basin productivity” for MCR steelhead in the Klickitat, and maintains that natural conditions in the basin make effective data collection difficult. However, indications are that steelhead densities and productivity in the basin are quite low, a straightforward conclusion the response seems at great pains

to avoid. At the very least, more specific information should be provided on how and when these important data gaps can be filled.

Given the uncertainty and difficulty the response acknowledges in determining levels of impact to listed fish from almost all program operations, we are disappointed not to see a discussion of monitoring or evaluation plans designed to fill relevant data gaps in these areas.

Response: Comment noted. WDFW is reviewing current monitoring efforts to prioritize them for Lower Columbia recovery strategies, overlaying assessments for hatchery requirements and incorporating current monitoring into an overall plan.

Comment # 41 Projected Take

No attempt is made to estimate the level of take, yet this is what is explicitly requested in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

“Under the broad definition of ESA, ‘take’ of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When ‘take’ of a listed species is expected in the hatchery operation, the ESA *requires* that a numerical estimate be quantified as best as possible.” (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NOAA, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center’s assistance if necessary in making these critical assessments.

The response regarding contingency planning provides boilerplate assurance (pasted into HGMP after HGMP) that if WDFW monitors any “additional” or “significant” mortality among listed salmonids, it will seek “guidance” and

“determine an appropriate plan.” It amounts to little more than a commitment to do something. The term “additional mortality” is meaningless in this context, as the HGMP steadfastly refuses to present any quantitative estimates of current mortality levels from the program. The response should include a list of predetermined management options for response to specific performance indicators regarding levels of take attributable to the program.

Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for reacting to circumstances where impact thresholds are exceeded.

For instance, a suite of potential response-options should be developed for a range of potential circumstances including levels of interaction between hatchery and wild listed-juveniles above or between a series of predetermined thresholds, or levels of HORs present in natural spawning areas with listed conspecifics above or between a series of predetermined thresholds. Monitoring and evaluations plans adequate to generate, analyze, and act on the relevant data should be developed and described.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data indicating that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Response: Comment noted, additional information would be valuable and could be provided in the future, also see response to general comment #3.

Comment # 42 Sections 3.1 and 3.2

As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles in each affected basin or subbasin as well as to the total number of hatchery juvenile releases planned for the whole of the MCR, LCR, and UWR ESUs. It does not seem possible to adequately describe or characterize either the magnitude of a particular hatchery program or its relationship to other management objectives without providing a sense of the scale of the total planned

production of hatchery juveniles in the mid and lower Columbia River, relative to the estimated numbers of listed juveniles likely to be present in those same areas.

The responses fail to actually “describe (the) alignment of the hatchery program” with any of the documents, policies, or plans listed, or discuss any “deviations from the plan or policies.” They merely assert that hatchery operations are “consistent” with a list of plans.

WDFW’s own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State. WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. The ISAB’s Review provides an exceptionally valuable blueprint for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” In other words, the findings and recommendations of the review should be applicable to most if not all programs throughout the basin. We repeat our recommendation that WDFW align the development of this and all other HGMPs currently available for public review with the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003) See comments on Section 1.16, above.

Response: Comment noted additional information would be valuable and could be provided in the future; also see response to general comment # 4.

Comment # 43 Section 3.3.1

Washington Trout agrees that providing “an important early component of fishing opportunity for tribal fishers” is a compelling social benefit of the program that warrants significant consideration in weighing the costs and benefits of the program and in making an ESA determination.

ESA determinations will likely involve analysis of individual hatchery programs on their own merits, and on their relative contributions to the cumulative costs and benefits of the impacts of Columbia Basin hatchery programs overall. It is critically important that each HGMP presents information regarding all the potential risks, impacts, and benefits of the proposed programs that is as accurate, thorough, and transparent as possible. It is likely that other programs in the MCR or LCR ESUs may be providing significant social, economic, or even ecological benefits at lower relative risk and cost than the program described in this HGMP, even while those benefits may not equal the value of providing important cultural, subsistence, or ceremonial opportunities to members of the Yakama Nation. For these and other reasons, Washington Trout suggests that the applicants present more detailed information describing the full scope of the social and cultural benefits the program is likely providing.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. After re-reading this section of the HGMP, WDFW believes it has provided the requested information.

Comment # 44 Section 3.4

An estimate of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production should be provided in response to this section. Broad descriptions are provided of major limiting factors to natural production and capacity, and of local and regional efforts to identify and redress limiting factors, but no estimates of natural-production benefits from those efforts are provided. The response describes EDT and its potential applications, but it does not describe how it has been applied in the Klickitat Basin or what if anything it has determined.

These factors are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this section is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 45 Section 3.5.

The response acknowledges that “co-occurring natural salmon and steelhead populations in local tributary areas and the Columbia River mainstem corridor areas could be negatively impacted by program fish.” It identifies fish from all

Columbia and Snake Basin ESUs as being of “primary concern” in this context. This should be reconciled with other sections of the HGMP (see sections 2.2.1 – 2.2.3). The response asserts, “listed fish can be impacted thru a complex web of short and long term processes and over multiple time periods which makes evaluation of this a (sic) net effect difficult.” As noted above, the admitted difficulty of determining impact levels does not justify giving up the search, or dismissing obvious risks of impacts. The response states, “WDFW is unaware of studies directly evaluating adverse ecological effects to listed salmon.” The statement appears to be a reference to earlier statements that WDFW is unaware of studies directly evaluating adverse ecological effects *from this program* to listed salmon. That is not the relevant issue. The relevant issue is whether or not particular or cumulative risks rise to a level that negative impacts would be likely. In the case of this program, the risks of several types of significant impacts to naturally occurring listed populations would appear to be high.

The list of potential positive impacts from the program include some highly conjectural and controversial items. This review has never before encountered the assertion that “the hatchery program may be filling an ecological niche in the freshwater and marine ecosystem.” The supposition that, “migrating hatchery fish may overwhelm predator populations, providing a protective effect to the co-occurring wild populations,” has to be weighed against the at least equally plausible conjecture that large, consistent annual releases of migrating hatchery fish attract, maintain, and potentially increase predator populations in areas where they will be likely to encounter listed salmon and steelhead, thereby increasing predation impacts on those listed populations. Evidence surrounding bird-predation of juvenile salmon in the lower Columbia mainstem might support this latter conjecture. WT concurs that nutrient-loading with salmon carcasses can potentially stimulate stream productivity and provide some ecological benefit for several species. But there are risks involved, and at any rate the response does not discuss how the release of smolts with a .23% survival rate will create meaningful, sustainable nutrient distribution throughout the basin.

Response: Comments noted, current return rates have increased in past years. In many systems where hatcheries are located, carcasses are being distributed in upper river sites or tributaries. Although a given year can have a 0.23% survival rate, fish returns beyond hatchery broodstock needs and interim escapement goals have made additional fish available for nutrient enhancement or carcass surplus options (food bank).

Comment # 46 Section 4.1.

The response does not adequately describe the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described.

The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

Response: Comment noted, additional information would be valuable and could be provided in the future, although important limitations to program goals such as temperature problems are included.

Comment # 47 Section 4.2

The response acknowledges that the intake structure is out of compliance with NOAA standards. Funding has apparently been requested, but the status of the request is not discussed, and no timeline for bringing the facility into compliance is provided.

Regarding water withdrawal and effluent discharge, the response does not describe actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. The NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by hatchery facility location and operations. Relevant issues regarding effluent discharge that should be addressed in this subsection include: stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.

Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described. The results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters.

Response: The Department of Ecology has regulatory responsibility for implementation of the Clean Water Act in Washington, including the National Pollutant Discharge Elimination System (NPDES). WDFW facilities are typically operated under a general permit for ‘Upland Fin-fish Hatchery and Rearing’. The permit specifies the water quality parameters, sampling protocols, and reporting requirements for each permitted

facility. Monthly and annual reports on water quality sampling and the use of chemicals at WDFW facilities are available from the Department of Ecology.

Comment # 48 Section 11.1

As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response does little more than very broadly describe the parameters that should be monitored and why. It does not describe how the parameters will be monitored. The response is not presented in the requested format, and does not appear to reconcile with all the performance “standards” and “indicators” presented in Section 1.10 (see comments on Section 1.10). (We suggest that some of the information provided in this response re importance of tribal fisheries on the Klickitat be added to the response in Section 3.3.1.)

As noted throughout this review, a monitoring and evaluation plan should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. No monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated*.

In its *Review of Public Comments Received on Puget Sound HGMPs* (2003), WDFW concurred with public comments that “Detailed description of the monitoring plans and methods related to the performance indicators is not provided,” and pledged to provide “additional details” for PS HGMP monitoring plans during the development of an Environmental Impact Statement on the overall PS hatchery program. Washington Trout submitted significant, substantive comments to WDFW regarding the unacceptable lack of detail in monitoring and evaluation plans in PS HGMPs, largely paralleling the relevant comments in this review. As far as we are aware, the public has not had opportunity to review any “additional details” regarding the monitoring plans for PS hatchery operations. However, this and other HGMPs currently available for review lack any significantly informative descriptions of the monitoring and evaluation plans associated with each proposed program. WDFW has so far failed to clearly demonstrate just how much it concurs with public input regarding this issue.

Response: WDFW concurs and will provide additional details on monitoring programs as the HGMPs are augmented during the iterative, ongoing review leading to the distribution of the Final Environmental Impact Statement.

Comment # 49 Section 11.1.2

The response appears to acknowledge that monitoring activities do not currently have adequate funding.

Response: Comment noted.

Comment # 50 Conclusion

The HGMP unfortunately provides no reason to believe that levels of take of listed species attributable to the proposed program are being or will be effectively contained. The HGMP commits to NO readily identifiable, measurable, or appropriate performance standards or indicators. It fails to identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The HGMP process offers the opportunity to evaluate several broad factors including: the justification for a particular hatchery program; the social, cultural, and economic benefits of the program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted.

The HGMP identifies a compelling social benefit from the program, providing cultural, ceremonial, and subsistence opportunities for members of the Yakama Nation. However, the levels of impacts from the program are not described in sufficient detail to determine whether hatchery benefits justify those impacts. Risks of several types of adverse impacts to listed populations from the program described in this HGMP appear to be high. Measures to minimize take are either inadequately described or based on assertions left unsupported. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

In our judgment, the application is inadequate to justify take authorization under the criteria enumerated in the 4d Rule.

Note:

Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Response: WDFW finds the overall review and comments to many of the HGMP sections to be helpful and informative. Additional assessments of hatchery operations,

environmental impacts with the natural environment and fish would be valuable but are dependent on many factors beyond current hatchery and program capabilities. The current Columbia river system Artificial Production and Review Evaluations (APRE) and HGMP processes are a way to identify funding priorities and needed changes. WDFW will be updating HGMPs in future phases and will work with NOAA and the recovery boards in order to supply the information as needed and identified.

**WDFW Hatchery and Genetic Management Plan:
Lewis River (Merwin) Winter Steelhead**

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Comment # 51 Section 1.8

Guidance from the HGMP Template clearly instructs that responses to this section should indicate *how* integrated harvest programs will be operated to provide fish for harvest “while minimizing adverse effects on listed fish.” This would appear to be the primary purpose for the entire HGMP process for take authorization. Insofar as WDFW attempts to designate conservation as a program purpose, it should acknowledge and respond to the Template’s instruction to provide an indication of *how* the program will “enhance or benefit” the target natural population.

Instead, the response begins with a list of legal and administrative mandates for the *purposes* of the program (the list might have been more appropriately included in a response to Section 1.7). WT believes that some of the acts, agreements, and decisions listed are at least ambivalent in regards to mandating this or any particular hatchery program. It is entirely plausible that several of these mandates could be satisfied by any number of other approaches. Why is it socially, economically, biologically, or even legally necessary or advisable to satisfy these mandates using this program at this facility? There may be several and varied justifications for meeting these mandates through the Lewis River Winter Steelhead Program, but they should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program. The response should describe why it is necessary to produce, rear, and release winter steelhead under the *specific* protocols proposed – again, in order that such justification can be weighed against the risk of potential take that may occur, relative to other options, including modifying, scaling back, replacing, or even discontinuing the program.

Listing mandates for the program does nothing to describe *how* the program will minimize adverse impacts on listed populations, or *how* it will benefit the target natural population (or indeed, *how* it will satisfy the listed mandates!). At least, the level of performance relative to the listed mandates should be described in detail in order to justify any biological risks of the program to listed Mid Columbia River steelhead, Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing) and Columbia River Chum. (While the Lewis River is technically outside the MCR steelhead ESU, the likely geographical and temporal scope of various hatchery-impacts should require examination of potential and likely impacts to those listed populations and an assessment of the appropriateness of take authorization relative to those impacts.) While the response includes skeletal

information about the legal, social, and political obligations of the program, and provides a cursory identification of some affected stakeholders, it fails to explain the program's success at providing any expected mitigation or other benefits, and does not supply any quantitative or even qualitative estimates of the economic or social activity that can be directly attributed to the program.

WDFW appears to assume one or both of two things: that because some or all of the listed mandates predate the listing of the relevant ESUs, the "benefit" of raising fish for harvest in the program has already been established, and should not require detailed explication; or that the mere assertion that the program "protects listed fish and provides harvest opportunity" is adequate to justify the program. Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of relevant 4d Rules and the HGMP template.

At any rate, the response lacks detail sufficient to assure that the program will indeed protect, mitigate, and enhance anadromous fish populations in the Lewis subbasin. In order to meet the HGMP requirement to adequately describe *how* the program will accomplish these goals, measurable, quantitative standards that provide clear threshold levels of benefits to be achieved and potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Table 1 describes aspects of program operations that are intended to reduce risks of potential adverse impacts on listed fish. However, the table only addresses a few selected risk factors; it does not address potential genetic impacts on LCR (or other) steelhead populations, potential migration or other behavioral impacts on LCR (or other) steelhead populations, or potential harvest impacts on relevant listed populations associated with harvest activities targeting steelhead produced by the program, to name just a few. It does not actually describe in any meaningful way actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. In some cases it appears only to describe what risk aversion measures are necessary.

References to other sections in the HGMP provide little clarification. Neither the table nor the references include or refer to appropriate measurable quantitative standards, and/or rely on dubious or unjustified assumptions and assertions about the sources of adverse impact and how they may best be minimized. The table itself and the information provided in the relevant HGMP references are repeated (often *verbatim*) without extensive case-specific qualifying information in nearly every HGMP. In some cases, program and/or species names are inappropriate to the specific HGMP, clearly indicating a cut-and-paste approach, and a sloppy one at that. It is frankly hard to escape the impression that WDFW does not take this particular ESA-related responsibility as seriously as it should. Boilerplate assertions are not an adequate substitute for honest, thoughtful, specific analyses of individual

WDFW hatchery programs and their potential harmful impacts on listed salmon and steelhead populations.

Table 1 references Section 7.9 of the HGMP to provide explication of “Risk Aversion Measures” relative to the “Potential Hazard” associated with Broodstock Collection and Adult Passage. In Section 7.9, NOAA queries applicants: “Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.” WDFW’s response is entirely too vague to provide any explication of the specific “Risk Aversion Measures” the program will undertake to avoid relevant potential hazards. A detailed description of *any* of the proposed “efforts” is entirely lacking. How effectively will the program limit take by identifying and immediately releasing non-target listed fish? How exactly will non-target fish be sorted from the holding pond, handled, and released? Can WDFW provide any estimate of expected mortality or decreased spawning success attributable to those encounters, as brief as they may be?

To provide explication of measures WDFW will employ to avoid potential risk associated with competition and predation, Table 1 references Sections 2.2.3 and 10.11 of the HGMP. Section 2.2.3 presents a relatively thorough attempt to support WDFW’s assertion that competition and predation impacts can be minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response to Section 2.2.3 still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds these issues. (See comments on Section 2.2.3.)

The response to Section 10.11 suffers from many of the same weaknesses repeated throughout the HGMP, insufficient detail and support for the broad assertions presented, information contradicted in other sections of the HGMP, a lack of case-specific information and analyses, and no acknowledgement or evaluation of likely risks to neighboring ESUs.

Guidance from NMFS on completing the HGMP Template directs applicants to “cite relevant reports... or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP,” and to “provide additional support of critical information” submitted in the HGMPs. WDFW provides no citations or documentation to support many of the assertions made in the response.

The HGMP should at least attempt to quantify the level of take managers would expect when program operations are configured to “minimize impacts on listed fish.” What is the target level of “minimized” impact? In its January 5, 2000 guidance document (*Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions*), NOAA Fisheries clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible” (paragraph G).

We are aware that in its response to public comments regarding Puget Sound HGMPs, WDFW asserted it was under no obligation to provide take estimates in this context. WT frankly disagrees. We find WDFW’s citation in support of this assertion at best inapplicable (WDFW clearly does have the capability to provide *some* reasonable numerical estimate of potential impact from at least several aspects of its hatchery operations). At any rate WDFW’s response does not reconcile with the unambiguous guidance provided in the January 2000 document, still referenced by NOAA Fisheries on its HGMP Template web page as providing “important instructions for the completion of an HGMP.” (<http://www.nwr.noaa.gov/1hgmp/hgmpmpl.htm>)

In sum, it appears that the response to Section 1.8 is *inadequate* to meet the requirements of the HGMP Template. As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. The significant shortcomings in this response alone would appear to render this HGMP application inadequate for federal approval.

Response: Refer to general comment number five “Failure to examine credible alternatives”.

Comment # 52 Sections 1.9 and 1.10

The Tables on pages 5 - 6 listing Performance Standards, Indicators, and Monitoring and Evaluation measures in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. The exact same tables are presented in nearly every HGMP currently available for public review. Taken by themselves the tables do not comply with the guidance provided in the HGMP Template to provide standards that are “*measurable, realistic, and time specific*” (emphasis added), and to provide indicators that identify “*specific parameters* to be monitored and evaluated.” (Emphasis added.) The repetition of this inadequate response throughout the HGMP package suggests an attempt to avoid thorough, case-specific analyses of the risks to listed salmon and steelhead populations presented by WDFW hatchery programs, and/or the specific measures that could potentially eliminate, minimize, or even evaluate those risks.

The tables presented in Section 1.10 are each designated as applicable to either “benefits” or “risks” per Template instructions. In general, the table listing performance standards and indicators for “benefits” comes closer to meeting the Template requirements, insofar as the standards listed correspond to samples provided in the NPPC *Artificial Production Review*. However, in most cases the Indicators listed do not reach the level of measurable specificity directed by the APR.

For instance, the table identifies the following standard: “Assure that hatchery operations support Columbia River fish Mgt. Plan (*US v Oregon*), production and harvest objectives.” This appears to adequately correspond to the following sample provided in the APR: “Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.” (The caveat of “avoiding overharvest of non-target species” is addressed in the following table; see below.) However, the corresponding Performance Indicators do not reach the level of specificity provided in the APR samples:

- *Indicator:* Annual number of fish produced by this program caught in all fisheries, including estimates of fish released and associated incidental mortalities, by fishery.
- *Indicator:* Annual numbers of each non-target species caught (including fish retained and fish released/discarded) in fisheries targeting this population.
- *Indicator:* Recreational angler days, by fishery.
- *Indicator:* Annual escapements of natural populations that are affected by fisheries targeting program fish.
- *Indicator:* Catch per unit effort, by fishery.

This higher level of specificity is required in order to *adequately* judge how the program performs relative to objectives and applicable mandates, and to weigh the relative value of that performance against negative impacts to listed stocks that may occur. It is not credible that WDFW would not have this information available. (In the context of the HGMP Template, the *actual numerical estimates* corresponding to these sample indicators should be provided: i.e., “*Indicator:* 3354 winter steelhead harvested; 1677 tribal; 1677 non-tribal recreational; etc.” This is implicit in the guidance provided in the APR.)

The listed Performance Standard, “Program contributes to fulfilling tribal trust responsibility mandates and treaty rights” corresponds adequately to a relevant sample provided in the APR. However, the corresponding Performance Indicator is *not* an indicator (it really does nothing more than restate the standard), and does not even approach the measurable specificity of the samples provided in the APR:

- *Indicator:* Total number of fish harvested in tribal fisheries targeting this program.

- **Indicator:** Total fisher days or proportion of harvestable return taken in tribal resident fisheries, by fishery.
- **Indicator:** Tribal acknowledgment regarding fulfillment of tribal treaty rights.

(Again, terms like “Total number” and “Total fisher days” should be replaced by *actual numerical estimates*.)

The listed Performance Standard, “Region-wide, groups are marked in a manner consistent with information needs and protocols to estimate impacts to natural and hatchery origin fish” corresponds adequately to a relevant sample provided in the APR. (However, some description of the relevant “information needs and protocols” would be helpful.) But again, the corresponding Performance Indicators are little more than a restatement of the standard, and do little to identify any “specific parameters to be monitored” (HGMP Template), or provide “measurable metrics that bear directly on the quantitative determination as to whether or not the standard is being met” (*Artificial Production Review*; p 3). We include the following examples from the APR for comparison:

- **Indicator:** Marking rate by mark type for each release group.
- **Indicator:** Sampling rate by mark type for each fishery.
- **Indicator:** Number of marks of this program observed in fishery samples, and estimated total contribution of this population to fisheries, by fishery.

(Again, terms like “Marking rate,” “Sampling rate,” “Number of marks,” and “estimated total contribution” should be replaced by *actual numerical estimates*.)

The table does not include relevant performance standards/indicators for potential benefits associated with every purpose, goal, and/or justification of the program presented in sections 1.6 – 1.8. The APR provides sample performance standards and corresponding performance indicators for mitigation requirements, conservation of wild/naturally spawning populations, and socio-economic effectiveness (see *Artificial Production Review*; pp 6-19). None of these are included in the table. If nothing else, this illustrates an inherent weakness and inefficiency in WDFW’s “one size fits all” cut-and-paste approach to the development of the HGMPs currently available for review.

The “risks” table is even less adequate for the purposes of take authorization. “Minimize impacts and/or interactions to ESA listed fish” is not a bone fide standard, but at best is a program goal. The APR defines a performance standard as, “a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met.” (Emphasis added.) There is nothing quantifiable in this purported “standard,” and it is described in a way that actually makes it *impossible* to determine whether or not it is being met. What is meant by “minimize?” Will impacts be minimized relative to current levels, or some otherwise determined unacceptable level? What are those levels? How were they identified

and/or determined? Exactly which impacts and/or interactions will be minimized, and how will that minimization be achieved? How will compliance with this “standard” be judged?

The APR provides a range of performance standards/indicators that would be pertinent to the goal of minimizing impacts and/or interactions to ESA listed fish:

- Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population.
- Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of the population from which broodstock is taken.
- Broodstock collection does not significantly reduce potential juvenile production in natural rearing areas.
- Life history characteristics of the natural population do not change as a result of this artificial production program.
- Annual release numbers do not exceed estimated basin-wide and local habitat capacity, including spawning, freshwater rearing, migration corridor, and estuarine and nearshore rearing.
- Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.
- Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.
- Artificially produced origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning population.
- Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.
- Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally produced population.
- Weir/trap operations do not result in significant stress, injury, or mortality in natural populations.
- Predation by artificially produced fish on naturally produced fish does not significantly reduce numbers of natural fish.

(Note: We acknowledge that not all of these standards would be specifically applicable to this particular program in this particular ESU. However, we do believe that WDFW has been inappropriately dismissive of the potential genetic and ecological impacts of this program to other listed populations in bordering ESUs [see comments on Sections 2.2 – 2.2.2], and given the verbatim repetition of this table in nearly all the HGMPs currently available for public review, we wish to make these comments as broadly applicable to every HGMP as possible.)

The performance indicators provided in the table fail to meet a level of specificity to qualify as actual indicators. As in the Benefits table, they are generally no more than restatements of the purported standards, or at best lists of possible parameters that

could serve as indicators, if they were adequately monitored (and described in measurable terms). Few of the items listed under the heading Performance Indicator are clearly stated as a measurable indicator.

The Monitoring and Evaluation Plans corresponding to the standards and indicators presented in the two tables contain no measurable criteria and no specific descriptions of actions associated with attempts to measure either fishery benefits, or impacts of hatchery releases on listed populations.

For instance, the Monitoring and Evaluation Plan corresponding to the purported standard of minimizing impacts to listed fish includes the statement: “instream evaluations of... NOR/HOR ratio on the spawning grounds.” A mere statement that NOR/HOR ratios of adults will be “evaluated” fails to specify a number for an acceptable target-ratio, much less how such a ratio is to be estimated and where and when it will be measured. An adequate Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish. (An actual performance indicator associated with such monitoring plan might be "the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%.")

For the purported standard, “Harvest of hatchery-produced fish minimizes impact to wild populations,” no adequate indicators are provided, except in the most general terms (see comments on “benefits” table, above, for samples of more appropriate performance indicators). Likewise, the description of the corresponding monitoring and evaluation measures, “harvests are monitored by agencies and tribes to provide up to date information” provides little useful information. An adequate monitoring plan for these standards and indicators would at very least describe the methods by which catch will be monitored and survival rates estimated.

The failure to adequately respond to this section is acutely disappointing, given WDFW’s response to comments regarding this exact failure in the Puget Sound HGMPs made available for public review in summer 2003. In that response (WDFW; 2003), WDFW offered to revise those HGMPs to “provide *specific, numeric* performance measures for key program characteristics.” (Emphasis added.) As far as we know, the public has not been given opportunity to evaluate whether or how thoroughly those revisions have been completed, but the failure in this round of HGMPs to provide anything approaching quantifiable performance standards or include any measurable metrics as performance indicators is far from encouraging in this regard.

Response: Refer to general comment number one: “Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables”.

Comment # 53 Section 1.11.2.

The response identifies the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NOAA Fisheries or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur, in the Columbia mainstem, and in the associated estuary and nearshore environments. Some scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of Columbia-wide hatchery releases on listed fish.

We recommend that in addition to listing specific hatchery-program releases, an estimate also be made of the total numbers (by species) of hatchery salmonid juveniles that will be released in the basin, as well as the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating through and out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the Mainstem Columbia between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the Columbia estuary and associated nearshore environments, and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NOAA Fisheries and the public with the appropriate sense of the expected size of the program, and its potential contribution to cumulative impacts on all relevant listed populations from WDFW hatchery programs overall.

Response: WDFW agrees that this information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 54 Section 1.12.

The response only provides data on “Sport Harvest” and “Escapement” No information is provided on smolt-to-adult survival rates, total adult production levels, or HOR escapement to natural spawning areas. No discussion or analysis accompanies the data reported. The average annual harvest level reported is 2329, considerably below the performance indicator identified in section 1.10. No discussion accompanies this to indicate whether these harvest rates are acceptable, expected, or a matter of concern, despite clear guidance in the HGMP Template to provide program goals for these parameters.

The response should discuss the relationship of past performance to past goals. Mean performance appears to be low both objectively and relative to stated program goals. The program’s annual contribution to total-catch rates averages

2329 winter steelhead. Some discussion is due of how these numbers have and will meet stated program objectives to support meaningful harvest or meet mitigation requirements.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

- Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
- The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
- Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates: A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.
- In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery

program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 55 Section 1.16.

The HGMP Template clearly requires that if clear *alternatives to the proposed program* were considered that could potentially meet stated program goals or reduce program impacts, they be described and “reasons why those actions are not being proposed” provided.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates attributable to the program within the basin and neighboring basins are determined to be within the Wild Salmonid Policy guidelines; 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles.

An obvious course of action in view of stated program goals, the alleged and the largely unquantified (or apparently unrealized) benefits resulting from the program and the potential risks to listed populations, is to reduce or eliminate the program altogether. It appears that consideration of such an alternative in this section of the HGMP would be mandatory.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. One of the ISAB’s key findings was an urgent need to develop “robust experiments with *unsupplemented* reference streams” (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin.

Given the program's apparently marginal (at best) contribution to catch rates and associated mitigation obligations, it appears that the Basin might make a good candidate for the types of experiments surrounding hatchery closures being recommended by the ISAB and NOAA Fisheries' Salmon Recovery Science Review Panel. The RSRP issued a report of Panel meetings held July 2003, to discuss "how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations" and to "urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units."

The RSRP specifically endorsed the findings and recommendations of the ISAB Review, and made several findings and recommendations of its own. The RSRP found, among other things, that "questions on the negative impact of hatchery fish on wild stocks abound ..., while scant progress has been made toward investigation and resolution of this major topic." The report noted that "In all examples that the RSRP has been able to locate, when experiments were conducted to test claims for the success of hatcheries in promoting the conservation of naturally spawning fish, the initial claims have been proven false." The report found that large-scale experiments involving hatchery closures could test "possible consequences" of current hatchery programs, including:

- Do hatchery releases cause extreme ecological stress to natural fish in streams?
- Will supplementation hatchery programs increase the number of natural-origin adults on the spawning grounds?
- Are there only minor negative consequences of taking wild fish for broodstock?
- Is the increased predation on natural-origin fish in a mixed-species fishery significant?
- Do hatchery releases seriously influence the marine growth and survival of natural fish?
- What is the effect of spawners that are strays from production hatcheries on the genetics of wild stock?

The RSRP explicitly emphasized that "critical data on the demographic and genetic effects of hatchery fish on the wild population can be obtained *only by completely eliminating gene flow from the hatchery to the wild population*, and by observing demographic and evolutionary changes in both populations as they (re)adapt to their own environments" (emphasis added), and that "a full assessment of interacting demographic and genetic effects of hatchery fish on the wild population can only be obtained from additional experiments in which some hatchery programs (if not the entire hatchery) are completely terminated to remove competition between hatchery and wild fish in freshwater and estuarine habitats." The report recommends an experimental approach that stops or otherwise modifies hatchery production in a watershed and compares various aspects of subsequent performance of the affected wild salmon population with those in a population whose hatchery operations have not been altered.

These alternatives, it seems to us, would be consistent with overall social and legal mandates listed as “justifications” for the current program, particularly given the value such options would have for other ongoing supplementation experiments. Serious evaluation of these potential alternatives should be undertaken.

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” The RSRP found “an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation.” In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW’s response to public comments, as well as NOAA Fisheries’ review of submitted HGMPs.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River in Puget Sound provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1994-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook

have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, coupled with relatively intensive habitat protection and recovery, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Response: Refer to general comment number five “Failure to examine credible alternatives”. Both current goals and justification of the existing programs in the Lower Columbia were the result of mitigation for dams. With ESA listings in 1998, WDFW is examining alternatives for integrating the current population to contribute to recovery. Increased assessments, monitoring and recommendations: “*Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003)”, will be used in future decisions.

Comment # 56 Section 2.2.1

This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe: “adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing.” The response does not address, let alone emphasize, “spatial and temporal distribution relative to hatchery fish release locations and weir sites.”

If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

In addition to Lower Columbia River chinook, LCR steelhead, and LCR coho (proposed for Threatened listing), the HGMP should examine the potential for impact from this proposed program to listed populations of salmon and steelhead in the Columbia River Chum, Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. The HGMP Template instructs applicants to identify all listed populations that may be incidentally affected by the program, including all listed populations in the proposed program’s juvenile-release and adult-return areas.

Hatchery-release areas would include at least all freshwater, estuarine, and nearshore marine environments where hatchery juveniles would be expected to pass through and potentially commingle, interact with, and impose ecological impacts on listed fish. In this case, those areas would include the mainstem of the Lewis and the mainstem Columbia, its estuary, and associated nearshore environments. Adult-return areas would include at least all estuarine and freshwater areas where HORs of this proposed program would be expected to pass through and potentially impose ecological impacts on listed fish, or where they might be expected to stray to and interact with listed fish on natural spawning areas, potentially imposing ecological and genetic impacts on listed fish. In this case those areas would include the mainstem of the Columbia and its estuary down stream of the Lewis, and tributaries of the Columbia between its estuary and the mouth of the Lewis. Listed fish from the above-named ESUs will be present in all these areas and “may be incidentally affected by the program.”

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

The status of the current ESA listings (proposed) include the hatchery population and available status information accompanies both. Information throughout the HGMP describes hatchery release locations and weir sites. Other sections throughout the HGMP (2.2.3) attempt to describe both spatial and temporal distribution. The potential negative impact for all Columbia ESUs are contained in section 3.5 (Ecological Interactions).

Comment # 57 Section 2.2.2

The response should include appropriate descriptions of the Mid Columbia River steelhead, Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. The status descriptions provided do not identify whether the information requested in this section is available for those ESUs. Without estimates of annual juvenile production and basin capacity, the HGMP cannot provide an accurate description of the scale of proposed hatchery-releases relative to the production and capacity of listed fish in the basin or basins. The HGMP should

provide the relevant estimates for affected populations in the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. Estimates should also be provided for total hatchery releases likely to be present in the relevant areas of the Columbia mainstem, so the proposed program's contribution to the overall scale hatchery releases in the mid and lower Columbia basins can be evaluated.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. NOAA's cumulative effects analysis will be evaluating this.

Comment # 58 Section 2.2.3.

The response presents a relatively thorough attempt to describe program activities that may impact listed populations, and the risks of those impacts. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds some of these issues.

Broodstock Program

The response asserts that various harvest, brood-collection, acclimation, and release strategies limit the genetic impacts to listed fish from the program. The assertions are unsupported, and/or based on unproven assumptions. The response does not include information regarding the percentage of HORs present in natural spawning areas. That ratio would provide a clear indicator of the performance of the described efforts to limit genetic impacts.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 58 Rearing Program

The response includes information about water quality permitting and monitoring, but none about applicable water-quality standards or program performance relative to those standards or any other conditions of the relevant permits. The types or amounts of effluent discharged from the hatchery facility are not listed.

Information about disease transfer is vague, if not to say unsettling. The "significant" consequences of outbreaks are described, but little useful information is provided regarding the history of or potential for disease transfer at this facility, other than cryptic indications of "greatly improved" health conditions and success

at “reducing” disease outbreaks. What are the pathogens involved? How often have disease outbreaks occurred? What were the consequences? If performance in this regard has improved, by what measure, by how much, and for how long?

Response: WDFW agrees that more information is valuable and may be added in the future. Concerns such as disease are covered in other parts of the HGMP, such as in Section 9.2.7. Effluent monitoring reports can be requested through the NPDES permitting system.

Comment # 59 Release Program

The response provides relatively detailed information intended to support WDFW’s assertion that competition and predation impacts can be effectively minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. However, the response is weakened by a reliance on some unsupported and sometimes contradictory assumptions, its failure to consider impacts to neighboring ESUs, and its inappropriate reaction to uncertainty.

The response acknowledges that “Salmon and steelhead feed actively during their downstream migration (Becker 1973; Muir and Emmelt 1988; Sager and Glova 1988) and if they do not migrate they can compete with wild fish,” but then presents information and references to support the assertions that wild and hatchery juveniles are effectively segregated by some behavioral and habitat-preference differences between hatchery and wild juveniles, and “rapid” downstream migration of hatchery juveniles released as smolts.

The response states that, “WDFW is unaware of any studies that have empirically estimated the competition risks to listed species posed by the program described in this HGMP.” This statement is repeated or paraphrased several times throughout the response and in nearly every HGMP. In fact the bulk and substance of the response is repeated essentially verbatim in nearly every HGMP. In the absence of such a narrow study, the HGMP invests a high degree of confidence in “studies conducted in other areas (that) indicate that this program is likely to pose a minimal risk of competition.” At best the referenced studies “suggest” support for the relevant assertion; they do not “indicate” anything in this context. But never mind semantics; without due consideration of studies in “other areas” that may suggest a potential for more than “minimal” competition-impacts from the proposed program, WDFW’s value-standard risks a bias toward particular assumptions about program performance.

The response acknowledges that releases will occur during the middle of the outmigration period for listed juvenile chinook. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department’s own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period

of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This suggests it would be extremely unlikely in this case that hatchery smolt releases can be scheduled to temporally segregate them from all wild emigration unless hatchery releases occur in late August or early September. The response fails to acknowledge or address the likelihood of hatchery juveniles interacting with rearing juveniles of other listed species/populations, including populations that employ life-history strategies that include multi-year freshwater rearing.

The response relies on findings in Flagg et al that “it is unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the estuarine environment.” But it does not discuss current work in Puget Sound that strongly suggests hatchery and wild juvenile salmonids are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings. These data should warrant some discussion and analysis in this context, insofar as WDFW is relying on studies in “other areas” to support the assertion that it can successfully minimize adverse impacts to listed populations by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

The response makes a reasonably strong case that temporally and/or spatially segregating hatchery juveniles from listed juveniles can reduce or minimize competition-impacts to listed juveniles in freshwater habitats. However, the response rather overstates the conclusiveness of the evidence presented to support the assertion that wild and hatchery juveniles are being effectively segregated by the release strategies described in this and other HGMPs currently available for public

review. The response acknowledges uncertainty about the level of interactions between hatchery and wild juveniles in the Columbia estuary, and about the consequences of those interactions.

The response acknowledges a high likelihood of interactions between hatchery smolts and listed juvenile steelhead, chinook, and coho. The response appears to acknowledge a high risk of predation to listed juvenile chinook and coho. The response does acknowledge that listed juveniles likely to interact with planned hatchery releases will be present in sizes within prey-size for hatchery smolts by WDFW's standard, and well within likely prey-size by other potentially more appropriate standards. No information is provided on the in-basin production of wild listed juveniles, relative to the 100,000 hatchery steelhead-smolts (and the sum of all other hatchery releases in the basin), in order to evaluate the likely scope of potential competitive or predation interactions. The response ignores the potential for encounters with listed juveniles of other ESUs that may be rearing and/or migrating in the mainstem Columbia or its estuary, even though it acknowledges that encounters with LCR chinook, LCR coho, and LCR steelhead could occur in the Columbia mainstem. The admission that "it is unknown to what extent listed fish are available both behaviorally or spatially on the migration corridor" underscores the necessity of considering ecological impacts to other ESUs in the migration corridor, given the admission early in the response that "salmon and steelhead feed actively during their downstream migration."

The response acknowledges a high level of scientific uncertainty regarding the frequency of competitive interactions between hatchery and wild juveniles, and in determining the consequences of those interactions. But the reaction to that uncertainty is inappropriate.

When faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from data gaps or uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- assumptions should be employed that risk over-estimating rather than under-estimating the level of take. The estimation process ought to be more concerned with providing reasonably low probability of making a Type II error than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no or little take. The HGMP is simply more concerned about wrongly over-estimating a level of take than it is with failing to guard listed juveniles against a credible risk. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

While the HGMP makes a reasonable case that evidence exists to suggest that impacts from competitive interactions between wild and hatchery juveniles are difficult to quantify, it fails to make a compelling case that these risks can be dismissed.

In identifying and analyzing risk factors for competition and predation, the response fails to adequately address several relevant issues. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. The relative sizes of released hatchery smolts and wild listed juveniles should be specified and then evaluated with respect to potential levels of competition and predation. While the response provides some of this information, it fails to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume (or imply) that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes are needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response is significantly weakened by its failure to include evaluations of the likelihood of competitive interactions with juvenile salmon and steelhead from the Mid Columbia River steelhead, Columbia River Chum, Upper Willamette River chinook, and UWR steelhead ESUs. For instance, evaluation of risks to listed fish from predation focuses its analysis on the likelihood of interactions and relative body size between program releases and LCR chinook, coho, and steelhead in the Lewis basin. This leaves too many significant issues completely unevaluated. For instance, how will the relative body size of listed chinook, coho, chum, and steelhead juveniles likely to be rearing and/or migrating in the lower mainstem Columbia or its estuary during the period that program releases will be outmigrating bear on predation and/or competition impacts attributable to the program?

The risk of take from potential genetic impacts should be analyzed in the context of hatchery releases. No information is provided about spawning interactions between HORs and NORs, but sufficient evidence exists to also suggest that HORs from the proposed program could be straying to natural spawning areas both within and among subbasins in the Columbia Watershed. The HGMP for the KALAMA Fall Chinook Program acknowledges as much in Section 6.2.1 (“strays from other hatcheries within this GDU are common”). The potential for spawning interactions between program HORs and wild listed steelhead in Columbia River tributaries within the LCR ESU should be evaluated.

Response: Comment noted. Steelhead are reared to a size that significantly contributes to smolt-to-adult survival and ensures rapid downstream migration. Listed steelhead spawning habitat is segregated temporally from hatchery steelhead. The HGMPs in section 2.2.3 provides much of the same information stated here.

A number of efforts will be on-going to integrate populations (AHA, BRAP and LCFRB Subbasin Planning). All will review the implications and concerns the reader has in these sections.

Comment # 61 Monitoring

Given the uncertainty and difficulty the response acknowledges in determining levels of impact to listed fish from almost all program operations, we are disappointed not to see a discussion of monitoring or evaluation plans designed to fill relevant data gaps in these areas.

Response: Comment noted. WDFW is reviewing current monitoring efforts to prioritize them for Lower Columbia recovery strategies, overlaying assessments for hatchery requirements and incorporating current monitoring into an overall plan.

Comment # 62 Projected Take

No attempt is made to estimate the level of take, yet this is what is explicitly requested in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

“Under the broad definition of ESA, ‘take’ of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When ‘take’ of a listed species is expected in the hatchery operation, the ESA *requires* that a numerical estimate be quantified as best as possible.” (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NOAA, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these

aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center's assistance if necessary in making these critical assessments.

The response regarding contingency planning provides boilerplate assurance (pasted into HGMP after HGMP) that if WDFW monitors any "additional" or "significant" mortality among listed salmonids, it will seek "guidance" and "determine an appropriate plan." It amounts to little more than a commitment to do something. The term "additional mortality" is meaningless in this context, as the HGMP steadfastly refuses to present any quantitative estimates of current mortality levels from the program. The response should include a list of predetermined management options for response to specific performance indicators regarding levels of take attributable to the program.

Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for reacting to circumstances where impact thresholds are exceeded.

For instance, a suite of potential response-options should be developed for a range of potential circumstances including levels of interaction between hatchery and wild listed-juveniles above or between a series of predetermined thresholds, or levels of HORs present in natural spawning areas with listed conspecifics above or between a series of predetermined thresholds. Monitoring and evaluations plans adequate to generate, analyze, and act on the relevant data should be developed and described.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data indicating that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Response: Comment noted, additional information would be valuable and maybe provided in the future, also see response to general comment #3.

Comment # 63 Sections 3.1 and 3.2

As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles in each affected basin or subbasin as well as to the total number of hatchery juvenile releases planned for the whole of the MCR, LCR, and UWR ESUs. It does not seem possible to adequately describe or characterize either the magnitude of a particular hatchery program or its relationship to other management objectives without providing a sense of the scale of the total planned production of hatchery juveniles in the mid and lower Columbia River, relative to the estimated numbers of listed juveniles likely to be present in those same areas.

The responses fail to actually “describe (the) alignment of the hatchery program” with any of the documents, policies, or plans listed, or discuss any “deviations from the plan or policies.” They merely assert that hatchery operations are “consistent” with a list of plans.

WDFW’s own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State. WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. The ISAB’s Review provides an exceptionally valuable blueprint for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” In other words, the findings and recommendations of the review should be applicable to most if not all programs throughout the basin. We repeat our recommendation that WDFW align the development of this and all other HGMPs currently available for public review with the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003) See comments on Section 1.16, above.

Response: Comment noted, additional information would be valuable and maybe provided in the future; also see response to general comment # 4.

Comment # 63 Sections 3.3 and 3.3.1

The response provides little of the information requested by the HGMP Template. The response provides no information about the integration of this hatchery program with the harvest management processes described. The Template requests quantitative evidence of the fishery benefits actually provided by a particular hatchery program, including estimates of future rates, and of harvest impacts on listed fish. The response provides Sport Harvest levels for the years 94/95 – 02/03. The mean harvest level of 2329 is well below the identified performance indicator for the program. The shortfall should be discussed in this section

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. After re-reading this section of the HGMP, WDFW believes it has provided the requested information.

Comment # 64 Section 3.4

An estimate of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production should be provided in response to this section. Broad descriptions are provided of major limiting factors to natural production and capacity, and of local and regional efforts to identify and redress limiting factors, but no estimates of natural-production benefits from those efforts are provided. The response describes EDT and its potential applications, but it does not describe how it has been applied in the Lewis Basin or what if anything it has determined.

These factors are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this section is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 65 Section 3.5.

The response acknowledges that “co-occurring natural salmon and steelhead populations in local tributary areas and the Columbia River mainstem corridor areas could be negatively impacted by program fish.” It identifies fish from all Columbia and Snake Basin ESUs as being of “primary concern” in this context. This should be reconciled with other sections of the HGMP (see sections 2.2.1 – 2.2.3). The response asserts, “listed fish can be impacted thru a complex

web of short and long term processes and over multiple time periods which makes evaluation of this a (sic) net effect difficult.” As noted above, the admitted difficulty of determining impact levels does not justify giving up the search, or dismissing obvious risks of impacts. The response states, “WDFW is unaware of studies directly evaluating adverse ecological effects to listed salmon.” The statement appears to be a reference to earlier statements that WDFW is unaware of studies directly evaluating adverse ecological effects *from this program* to listed salmon. That is not the relevant issue. The relevant issue is whether or not particular or cumulative risks rise to a level that negative impacts would be likely. In the case of this program, the risks of several types of significant impacts to naturally occurring listed populations would appear to be high.

The list of potential positive impacts from the program include some highly conjectural and controversial items. This review has never before encountered the assertion that “the hatchery program may be filling an ecological niche in the freshwater and marine ecosystem.” The supposition that, “migrating hatchery fish may overwhelm predator populations, providing a protective effect to the co-occurring wild populations,” has to be weighed against the at least equally plausible conjecture that large, consistent annual releases of migrating hatchery fish attract, maintain, and potentially increase predator populations in areas where they will be likely to encounter listed salmon and steelhead, thereby increasing predation impacts on those listed populations. Evidence surrounding bird-predation of juvenile salmon in the lower Columbia mainstem might support this latter conjecture. WT concurs that nutrient-loading with salmon carcasses can potentially stimulate stream productivity and provide some ecological benefit for several species. But there are risks involved, and at any rate the response does not discuss how the release of 100,000 steelhead smolts will create meaningful, sustainable nutrient distribution throughout the basin.

Response: Comments noted, current return rates have increased in past years. In many systems where hatcheries are located, carcasses are being distributed in upper river sites or tributaries. Although a given year can have a return beyond hatchery broodstock needs, this can lead to increased harvest opportunity, additional fish available for nutrient enhancement or carcass surplus options (food bank).

Comments # 66 Section 4.1.

The response does not adequately describe the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described. The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

Response: Comment noted, additional information would be valuable and may be provided in the future, although important limitations to program goals such as temperature problems are included.

Comment # 67 Section 4.2

The response indicates that the fish screen on the *WF Washougal* is out of compliance with NOAA fish-screening standards. This is confusing, and appears to be a mistake, resulting from the table being pasted from another HGMP without appropriate revision. Information about screening at the relevant facility should be included.

Regarding water withdrawal and effluent discharge, the response does not describe actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. The NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by hatchery facility location and operations. Relevant issues regarding effluent discharge that should be addressed in this subsection include: stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.

Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described. The results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters.

Response: Inappropriate references will be corrected in future version of this HGMP prior to final submission. The Department of Ecology has regulatory responsibility for implementation of the Clean Water Act in Washington, including the National Pollutant Discharge Elimination System (NPDES). WDFW facilities are typically operated under a general permit for ‘Upland Fin-fish Hatchery and Rearing’. The permit specifies the water quality parameters, sampling protocols, and reporting requirements for each

permitted facility. Monthly and annual reports on water quality sampling and the use of chemicals at WDFW facilities are available from the Department of Ecology.

Comments # 68 Section 11.1

As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response does little more than very broadly describe the parameters that should be monitored and why. It does not describe how the parameters will be monitored. The response is not presented in the requested format, and does not appear to reconcile with all the performance “standards” and “indicators” presented in Section 1.10 (see comments on Section 1.10).

As noted throughout this review, a monitoring and evaluation plan should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. No monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated*.

In its *Review of Public Comments Received on Puget Sound HGMPs (2003)*, WDFW concurred with public comments that “Detailed description of the monitoring plans and methods related to the performance indicators is not provided,” and pledged to provide “additional details” for PS HGMP monitoring plans during the development of an Environmental Impact Statement on the overall PS hatchery program. Washington Trout submitted significant, substantive comments to WDFW regarding the unacceptable lack of detail in monitoring and evaluation plans in PS HGMPs, largely paralleling the relevant comments in this review. As far as we are aware, the public has not had opportunity to review any “additional details” regarding the monitoring plans for PS hatchery operations. However, this and other HGMPs currently available for review lack any significantly informative descriptions of the monitoring and evaluation plans associated with each proposed program. WDFW has so far failed to clearly demonstrate just how much it concurs with public input regarding this issue.

Response: WDFW concurs and will provide additional details on monitoring plans as the HGMPs are augmented during the iterative, ongoing review leading to the distribution of the Final Environmental Impact Statement.

Comment # 69 Section 11.1.2

The response appears to acknowledge that some monitoring activities will be exposed to budget limits.

Response: Comment noted.

Comment # 70 Conclusion

The HGMP unfortunately provides no reason to believe that levels of take of listed species attributable to the proposed program are being or will be effectively contained, or that hatchery benefits justify those impacts. The HGMP commits to NO readily identifiable, measurable, or appropriate performance standards or indicators. It fails to identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The HGMP process offers the opportunity to evaluate several broad factors including: the justification for a particular hatchery program; the social, cultural, and economic benefits of the program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted.

The justification for the program is at best inadequately described. Risks of several types of adverse impacts to listed populations from the program described in this HGMP appear to be high. Measures to minimize take are either inadequately described or based on assertions left unsupported. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

In our judgment, the application is inadequate to justify take authorization under the criteria enumerated in the 4d Rule.

Note:

Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Response: WDFW finds the overall review and responses to many of the HGMP sections to be helpful and informative. Additional assessments of hatchery operations, environmental impacts with the natural environment and fish would be valuable but are dependent on many factors beyond current hatchery and program capabilities. The current Columbia river system Artificial Production and Review Evaluations (APRE) and HGMP processes are a way to identify funding priorities and needed changes. WDFW will be updating HGMPs in the future and will work with NOAA and the Recovery Boards in order to supply the information as needed.

**WDFW Hatchery and Genetic Management Plan:
Skamania Summer Steelhead (Washougal River)
Station Release and Outplants**

**Comments prepared and submitted by Washington Trout
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October 28, 2004**

Comment # 71 Section 1.8

Guidance from the HGMP Template clearly instructs that responses to this section should indicate *how* integrated harvest programs will be operated to provide fish for harvest “while minimizing adverse effects on listed fish.” This would appear to be the primary purpose for the entire HGMP process for take authorization. Insofar as WDFW attempts to designate conservation as a program purpose, it should acknowledge and respond to the Template’s instruction to provide an indication of *how* the program will “enhance or benefit” the target natural population.

Instead, the response indicates a legal and administrative mandate for the *purposes* of the program (the list might have been more appropriately included in a response to Section 1.7). WT believes that some of the acts, agreements, and decisions listed are at least ambivalent in regards to mandating this or any particular hatchery program. It is entirely plausible that several of these mandates could be satisfied by any number of other approaches. Why is it socially, economically, biologically, or even legally necessary or advisable to satisfy these mandates using this program at this facility? There may be several and varied justifications for meeting these mandates through the Washougal River Summer Steelhead Program, but they should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program. The response should describe why it is necessary to produce, rear, and release summer steelhead under the *specific* protocols proposed – again, in order that such justification can be weighed against the risk of potential take that may occur, relative to other options, including modifying, scaling back, replacing, or even discontinuing the program.

At any rate, this list of purported mandates does nothing to describe *how* the program will minimize adverse impacts on listed populations, or *how* it will benefit the target natural population (or indeed, *how* it will satisfy the listed mandates!). At least, the level of performance relative to the listed mandates should be described in detail in order to justify any biological risks of the program to listed Mid Columbia River steelhead, Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing) and Columbia River Chum. (While the Washougal River is technically outside the MCR steelhead ESU, the likely geographical and temporal scope of various hatchery-impacts should require examination of potential and likely impacts to those listed populations and an

assessment of the appropriateness of take authorization relative to those impacts.) While the response includes skeletal information about the legal, social, and political obligations of the program, and provides a cursory identification of some affected stakeholders, it fails to explain the program's success at providing any expected mitigation or other benefits, and does not supply any quantitative or even qualitative estimates of the economic or social activity that can be directly attributed to the program.

WDFW appears to assume one or both of two things: that because some or all of the listed mandates predate the listing of the relevant ESUs, the "benefit" of raising fish for harvest in the program has already been established, and should not require detailed explication; or that the mere assertion that the program "protects listed fish and provides harvest opportunity" is adequate to justify the program. Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of relevant 4d Rules and the HGMP template.

At any rate, the response lacks detail sufficient to assure that the program will indeed protect, mitigate, and enhance anadromous fish populations in the Washougal subbasin. In order to meet the HGMP requirement to adequately describe *how* the program will accomplish these goals, measurable, quantitative standards that provide clear threshold levels of benefits to be achieved and potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Table 1 describes aspects of program operations that are intended to reduce risks of potential adverse impacts on listed fish. However, the table only addresses a few selected risk factors; it does not address potential genetic impacts on LCR (or other) steelhead populations, potential migration or other behavioral impacts on LCR (or other) steelhead populations, or potential harvest impacts on relevant listed populations associated with harvest activities targeting steelhead produced by the program, to name just a few. It does not actually describe in any meaningful way actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. In some cases it appears only to describe what risk aversion measures are necessary.

References to other sections in the HGMP provide little clarification. Neither the table nor the references include or refer to appropriate measurable quantitative standards, and/or rely on dubious or unjustified assumptions and assertions about the sources of adverse impact and how they may best be minimized. The table itself and the information provided in the relevant HGMP references are repeated (often *verbatim*) without extensive case-specific qualifying information in nearly every HGMP. In some cases, program and/or species names are inappropriate to the specific HGMP, clearly indicating a cut-and-paste approach, and a sloppy one at that. It is frankly hard to escape the impression that WDFW does not take this particular ESA-related responsibility as seriously as it should. Boilerplate assertions

are not an adequate substitute for honest, thoughtful, specific analyses of individual WDFW hatchery programs and their potential harmful impacts on listed salmon and steelhead populations.

Table 1 references Section 7.9 of the HGMP to provide explication of “Risk Aversion Measures” relative to the “Potential Hazard” associated with Broodstock Collection and Adult Passage. In Section 7.9, NOAA queries applicants: “Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.” WDFW’s response is entirely too vague to provide any explication of the specific “Risk Aversion Measures” the program will undertake to avoid relevant potential hazards. A detailed description of *any* of the proposed “efforts” is entirely lacking. How effectively will the program limit take by identifying and immediately releasing non-target listed fish? How exactly will non-target fish be sorted from the holding pond, handled, and released? Can WDFW provide any estimate of expected mortality or decreased spawning success attributable to those encounters, as brief as they may be?

To provide explication of measures WDFW will employ to avoid potential risk associated with competition and predation, Table 1 references Sections 2.2.3 and 10.11 of the HGMP. Section 2.2.3 presents a relatively thorough attempt to support WDFW’s assertion that competition and predation impacts can be minimized by juvenile-release strategies currently employed at most WDFW hatchery programs, including those proposed in this HGMP. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response to Section 2.2.3 still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds these issues. (See comments on Section 2.2.3.)

The response to Section 10.11 suffers from many of the same weaknesses repeated throughout the HGMP, insufficient detail and support for the broad assertions presented, information contradicted in other sections of the HGMP, a lack of case-specific information and analyses, and no acknowledgement or evaluation of likely risks to neighboring ESUs.

Guidance from NMFS on completing the HGMP Template directs applicants to “cite relevant reports... or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP,” and to “provide additional support of critical information” submitted in the HGMPs. WDFW

provides no citations or documentation to support many of the assertions made in the response.

The HGMP should at least attempt to quantify the level of take managers would expect when program operations are configured to “minimize impacts on listed fish.” What is the target level of “minimized” impact? In its January 5, 2000 guidance document (*Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions*), NOAA Fisheries clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible” (paragraph G).

We are aware that in its response to public comments regarding Puget Sound HGMPs, WDFW asserted it was under no obligation to provide take estimates in this context. WT frankly disagrees. We find WDFW’s citation in support of this assertion at best inapplicable (WDFW clearly does have the capability to provide *some* reasonable numerical estimate of potential impact from at least several aspects of its hatchery operations). At any rate WDFW’s response does not reconcile with the unambiguous guidance provided in the January 2000 document, still referenced by NOAA Fisheries on its HGMP Template web page as providing “important instructions for the completion of an HGMP.” (<http://www.nwr.noaa.gov/1hgmp/hgmptmpl.htm>)

In sum, it appears that the response to Section 1.8 is *inadequate* to meet the requirements of the HGMP Template. As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. The significant shortcomings in this response alone would appear to render this HGMP application inadequate for federal approval.

Response: Refer to general comment number five “Failure to examine credible alternatives”.

Comment # 72 Sections 1.9 and 1.10

The Tables on pages 5 - 6 listing Performance Standards, Indicators, and Monitoring and Evaluation measures in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. The exact same tables are presented in nearly every HGMP currently available for public review. Taken by themselves the tables do not comply with the guidance provided in the HGMP Template to provide standards that are “*measurable, realistic, and time specific*” (emphasis added), and to provide indicators that identify “*specific parameters to be monitored and evaluated.*” (Emphasis added.) The repetition of this inadequate response throughout the HGMP package suggests an attempt to avoid thorough, case-specific analyses of the risks to listed salmon and steelhead

populations presented by WDFW hatchery programs, and/or the specific measures that could potentially eliminate, minimize, or even evaluate those risks.

The tables presented in Section 1.10 are each designated as applicable to either “benefits” or “risks” per Template instructions. In general, the table listing performance standards and indicators for “benefits” comes closer to meeting the Template requirements, insofar as the standards listed correspond to samples provided in the NPPC *Artificial Production Review*. However, in most cases the Indicators listed do not reach the level of measurable specificity directed by the APR.

For instance, the table identifies the following standard: “Assure that hatchery operations support Columbia River fish Mgt. Plan (*US v Oregon*), production and harvest objectives.” This appears to adequately correspond to the following sample provided in the APR: “Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.” (The caveat of “avoiding overharvest of non-target species” is addressed in the following table; see below.) However, the corresponding Performance Indicators do not reach the level of specificity provided in the APR samples:

- *Indicator:* Annual number of fish produced by this program caught in all fisheries, including estimates of fish released and associated incidental mortalities, by fishery.
- *Indicator:* Annual numbers of each non-target species caught (including fish retained and fish released/discarded) in fisheries targeting this population.
- *Indicator:* Recreational angler days, by fishery.
- *Indicator:* Annual escapements of natural populations that are affected by fisheries targeting program fish.
- *Indicator:* Catch per unit effort, by fishery.

This higher level of specificity is required in order to *adequately* judge how the program performs relative to objectives and applicable mandates, and to weigh the relative value of that performance against negative impacts to listed stocks that may occur. It is not credible that WDFW would not have this information available. (In the context of the HGMP Template, the *actual numerical estimates* corresponding to these sample indicators should be provided: i.e., “*Indicator:* 827 Kalama-Program fall chinook harvested; 414 tribal; 413 non-tribal recreational; etc.” This is implicit in the guidance provided in the APR.)

The performance indicator provided is derived from a table provided in response to Section 1.12, reporting “current” program performance. It does not seem appropriate to merely tally up past program performance – not apparently related to any particular goal at all – and simply declare it an acceptable performance indicator for future program operations, particularly when that performance appears to be low both objectively and relative to stated program goals. There is no

accompanying discussion of how adequately the performance indicator will “support” harvest or mitigation objectives, or how such a contribution to sport, tribal, and commercial fisheries can be considered at all “meaningful.”

The listed Performance Standard, “Program contributes to fulfilling tribal trust responsibility mandates and treaty rights” corresponds adequately to a relevant sample provided in the APR. However, the corresponding Performance Indicator is *not* an indicator (it really does nothing more than restate the standard), and does not even approach the measurable specificity of the samples provided in the APR:

- *Indicator:* Total number of fish harvested in tribal fisheries targeting this program.
- *Indicator:* Total fisher days or proportion of harvestable return taken in tribal resident fisheries, by fishery.
- *Indicator:* Tribal acknowledgment regarding fulfillment of tribal treaty rights.

(Again, terms like “Total number” and “Total fisher days” should be replaced by *actual numerical estimates*.)

The listed Performance Standard, “Region-wide, groups are marked in a manner consistent with information needs and protocols to estimate impacts to natural and hatchery origin fish” corresponds adequately to a relevant sample provided in the APR. (However, some description of the relevant “information needs and protocols” would be helpful.) But again, the corresponding Performance Indicators are little more than a restatement of the standard, and do little to identify any “specific parameters to be monitored” (HGMP Template), or provide “measurable metrics that bear directly on the quantitative determination as to whether or not the standard is being met” (*Artificial Production Review*; p 3). We include the following examples from the APR for comparison:

- *Indicator:* Marking rate by mark type for each release group.
- *Indicator:* Sampling rate by mark type for each fishery.
- *Indicator:* Number of marks of this program observed in fishery samples, and estimated total contribution of this population to fisheries, by fishery.

(Again, terms like “Marking rate,” “Sampling rate,” “Number of marks,” and “estimated total contribution” should be replaced by *actual numerical estimates*.)

The table does not include relevant performance standards/indicators for potential benefits associated with every purpose, goal, and/or justification of the program presented in sections 1.6 – 1.8. The APR provides sample performance standards and corresponding performance indicators for mitigation requirements, conservation of wild/naturally spawning populations, and socio-economic effectiveness (see *Artificial Production Review*; pp 6-19). None of these are included in the table. If nothing else, this illustrates an inherent weakness and inefficiency in

WDFW's "one size fits all" cut-and-paste approach to the development of the HGMPs currently available for review.

The "risks" table is even less adequate for the purposes of take authorization. "Minimize impacts and/or interactions to ESA listed fish" is not a bone fide standard, but at best is a program goal. The APR defines a performance standard as, "a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met." (Emphasis added.) There is nothing quantifiable in this purported "standard," and it is described in a way that actually makes it *impossible* to determine whether or not it is being met. What is meant by "minimize?" Will impacts be minimized relative to current levels, or some otherwise determined unacceptable level? What are those levels? How were they identified and/or determined? Exactly which impacts and/or interactions will be minimized, and how will that minimization be achieved? How will compliance with this "standard" be judged?

The APR provides a range of performance standards/indicators that would be pertinent to the goal of minimizing impacts and/or interactions to ESA listed fish:

- Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population.
- Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of the population from which broodstock is taken.
- Broodstock collection does not significantly reduce potential juvenile production in natural rearing areas.
- Life history characteristics of the natural population do not change as a result of this artificial production program.
- Annual release numbers do not exceed estimated basin-wide and local habitat capacity, including spawning, freshwater rearing, migration corridor, and estuarine and nearshore rearing.
- Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.
- Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.
- Artificially produced origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning population.
- Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.
- Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally produced population.
- Weir/trap operations do not result in significant stress, injury, or mortality in natural populations.
- Predation by artificially produced fish on naturally produced fish does not significantly reduce numbers of natural fish.

(Note: We acknowledge that not all of these standards would be specifically applicable to this particular program in this particular ESU. However, we do believe that WDFW has been inappropriately dismissive of the potential genetic and ecological impacts of this program to other listed populations in bordering ESUs [see comments on Sections 2.2 – 2.2.2], and given the verbatim repetition of this table in nearly all the HGMPs currently available for public review, we wish to make these comments as broadly applicable to every HGMP as possible.)

The performance indicators provided in the table fail to meet a level of specificity to qualify as actual indicators. As in the Benefits table, they are generally no more than restatements of the purported standards, or at best lists of possible parameters that could serve as indicators, if they were adequately monitored (and described in measurable terms). Few of the items listed under the heading Performance Indicator are clearly stated as a measurable indicator.

The Monitoring and Evaluation Plans corresponding to the standards and indicators presented in the two tables contain no measurable criteria and no specific descriptions of actions associated with attempts to measure either fishery benefits, or impacts of hatchery releases on listed populations.

For instance, the Monitoring and Evaluation Plan corresponding to the purported standard of minimizing impacts to listed fish includes the statement: “instream evaluations of... NOR/HOR ratio on the spawning grounds.” A mere statement that NOR/HOR ratios of adults will be “evaluated” fails to specify a number for an acceptable target-ratio, much less how such a ratio is to be estimated and where and when it will be measured. An adequate Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish. (An actual performance indicator associated with such monitoring plan might be “the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%.”)

For the purported standard, “Harvest of hatchery-produced fish minimizes impact to wild populations,” no adequate indicators are provided, except in the most general terms (see comments on “benefits” table, above, for samples of more appropriate performance indicators). Likewise, the description of the corresponding monitoring and evaluation measures, “harvests are monitored by agencies and tribes to provide up to date information” provides little useful information. An adequate monitoring plan for these standards and indicators would at very least describe the methods by which catch will be monitored and survival rates estimated.

The failure to adequately respond to this section is acutely disappointing, given WDFW’s response to comments regarding this exact failure in the Puget Sound

HGMPs made available for public review in summer 2003. In that response (WDFW; 2003), WDFW offered to revise those HGMPs to “provide *specific, numeric* performance measures for key program characteristics.” (Emphasis added.) As far as we know, the public has not been given opportunity to evaluate whether or how thoroughly those revisions have been completed, but the failure in this round of HGMPs to provide anything approaching quantifiable performance standards or include any measurable metrics as performance indicators is far from encouraging in this regard.

Response: Refer to general comment number one: “Failure to Adequately Describe Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables”.

Comment # 73 Section 1.11.2.

The response identifies the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NOAA Fisheries or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur, in the Columbia mainstem, and in the associated estuary and nearshore environments. Some scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of Columbia-wide hatchery releases on listed fish.

We recommend that in addition to listing specific hatchery-program releases, an estimate also be made of the total numbers (by species) of hatchery salmonid juveniles that will be released in the basin, as well as the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating through and out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the Mainstem Columbia between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the Columbia estuary and associated nearshore environments, and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NOAA Fisheries and the public with the appropriate sense of the expected size of the program, and its potential contribution to cumulative impacts on all relevant listed populations from WDFW hatchery programs overall.

Response: WDFW agrees that this information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 74 Section 1.12.

The response only provides data on “Sport Harvest.” No information is provided on smolt-to-adult survival rates, total adult production levels, escapement to the hatchery, or HOR escapement to natural spawning areas. No discussion or analysis accompanies the data reported. The average annual harvest level reported is 827. It is not clear if the mean sport-harvest level is for the Washougal-station release of 60,000, or the total release of 204,000 smolts associated with the program, as identified in Section 1.11.2. No discussion accompanies this to indicate whether these harvest rates are acceptable, expected, or a matter of concern, despite clear guidance in the HGMP Template to provide program goals for these parameters.

Insofar as the HGMP proposes to use the average of past program harvest-levels as acceptable performance indicator for future program operations (see Section 1.10), it has an obligation to discuss the relationship of past performance to past goals. Mean performance appears to be low both objectively and relative to stated program goals. The program’s annual contribution to total-catch rates averages 827 steelhead. Some discussion is due of how these numbers have and will meet stated program objectives to support meaningful harvest or meet mitigation requirements.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

- Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.**
- The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.**
- Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates: A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between**

hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.

- In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.**

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 75 Section 1.16.

The response acknowledges that funding is inadequate to adequately monitor the program or bring the facility and operations into compliance with ESA-related standards, but at the same time dismisses the alternative of eliminating the program on the basis that the program “supports a very popular sport fishery.” This should be more clearly reconciled in the response. How “popular” is the sport fishery? What are its specific social and economic benefits? How can those benefits outweigh risks to listed species imposed by the program if those risk cannot be monitored or contained?

The HGMP Template clearly requires that if clear *alternatives to the proposed program* were considered that could potentially meet stated program goals or reduce program impacts, they be described and “reasons why those actions are not being proposed” provided.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates attributable to the program within the basin and neighboring basins are determined to be within the Wild Salmonid Policy guidelines; 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles.

An obvious course of action in view of stated program goals, the alleged and the largely unquantified (or apparently unrealized) benefits resulting from the program and the potential risks to listed populations, is to reduce or eliminate the program altogether. It appears that consideration of such an alternative in this section of the HGMP would be mandatory.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. One of the ISAB's key findings was an urgent need to develop "robust experiments with *unsupplemented* reference streams" (emphasis added) in order to adequately quantify the benefits and/or impacts of hatchery supplementation of native salmonid stocks throughout the basin.

Given the program's apparently marginal (at best) contribution to catch rates and associated mitigation obligations, it appears that the Basin might make a good candidate for the types of experiments surrounding hatchery closures being recommended by the ISAB and NOAA Fisheries' Salmon Recovery Science Review Panel. The RSRP issued a report of Panel meetings held July 2003, to discuss "how modification or closure of hatcheries provides NOAA Fisheries with opportunities to investigate the experimental effects of hatcheries on wild populations" and to "urge that NOAA Fisheries take the lead in multi-agency efforts to utilize planned hatchery closures and modifications as experimental units."

The RSRP specifically endorsed the findings and recommendations of the ISAB Review, and made several findings and recommendations of its own. The RSRP found, among other things, that "questions on the negative impact of hatchery fish on wild stocks abound ..., while scant progress has been made toward investigation and resolution of this major topic." The report noted that "In all examples that the RSRP has been able to locate, when experiments were conducted to test claims for the success of hatcheries in promoting the conservation of naturally spawning fish, the initial claims have been proven false." The report found that large-scale experiments involving hatchery closures could test "possible consequences" of current hatchery programs, including:

- Do hatchery releases cause extreme ecological stress to natural fish in streams?
- Will supplementation hatchery programs increase the number of natural-origin adults on the spawning grounds?
- Are there only minor negative consequences of taking wild fish for broodstock?
- Is the increased predation on natural-origin fish in a mixed-species fishery significant?
- Do hatchery releases seriously influence the marine growth and survival of natural fish?
- What is the effect of spawners that are strays from production hatcheries on the genetics of wild stock?

The RSRP explicitly emphasized that “critical data on the demographic and genetic effects of hatchery fish on the wild population can be obtained *only by completely eliminating gene flow from the hatchery to the wild population*, and by observing demographic and evolutionary changes in both populations as they (re)adapt to their own environments” (emphasis added), and that “a full assessment of interacting demographic and genetic effects of hatchery fish on the wild population can only be obtained from additional experiments in which some hatchery programs (if not the entire hatchery) are completely terminated to remove competition between hatchery and wild fish in freshwater and estuarine habitats.” The report recommends an experimental approach that stops or otherwise modifies hatchery production in a watershed and compares various aspects of subsequent performance of the affected wild salmon population with those in a population whose hatchery operations have not been altered.

These alternatives, it seems to us, would be consistent with overall social and legal mandates listed as “justifications” for the current program, particularly given the value such options would have for other ongoing supplementation experiments. Serious evaluation of these potential alternatives should be undertaken.

Both the ISAB Review and the RSRP report provide exceptionally valuable blueprints for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” The RSRP found “an obvious need for additional experiments testing the efficacy of conservation hatcheries and of modified systems that have the joint objective of production and conservation.” In other words, the findings and recommendations of the two reports should be applicable to most if not all programs throughout the basin. We recommend that WDFW utilize the *Review of Salmon and Steelhead*

Supplementation (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003) as guides to developing reasonable alternatives to major characteristics of this and all other HGMPs currently available for public review. We have attached both documents to these comments, to be considered in WDFW's response to public comments, as well as NOAA Fisheries' review of submitted HGMPs.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River in Puget Sound provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1994-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This

compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, coupled with relatively intensive habitat protection and recovery, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Response: Refer to general comment number five “Failure to examine credible alternatives. Both current goals and justification of the existing programs in the Lower Columbia were the result of mitigation for dams. With ESA listings in 1998, WDFW is examining alternatives for integrating the current population to contribute to recovery. Increased assessments, monitoring and recommendations: “*Review of Salmon and Steelhead Supplementation* (ISAB; 2003), and the *Report for the RSRP Meeting Held July 21-23, 2003* (RSRP; 2003)”, will be used in future decisions.

Comment # 75 Section 2.2.1

This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe: “adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing.” The response does not address, let alone emphasize, “spatial and temporal distribution relative to hatchery fish release locations and weir sites.”

If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

In addition to Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), and Columbia River chum, the potential for impact from this proposed program to listed populations of salmon and steelhead in the Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. The HGMP Template instructs applicants to identify all listed populations that may be incidentally affected by the program, including all listed populations in the proposed program’s juvenile-release and adult-return areas.

Hatchery-release areas would include at least all freshwater, estuarine, and nearshore marine environments where hatchery juveniles would be expected to pass through and potentially commingle, interact with, and impose ecological impacts on listed fish. In this case, The HGMP appropriately acknowledges those areas would include the mainstem of the Washougal and mainstem Columbia, its estuary, and associated nearshore environments. Adult-return areas would include at least all estuarine and freshwater areas where HORs of this proposed program would be

expected to pass through and potentially impose ecological impacts on listed fish, or where they might be expected to stray to and interact with listed fish on natural spawning areas, potentially imposing ecological and genetic impacts on listed fish. In this case those areas would include the mainstem of the Columbia and its estuary down stream of the Washougal, and tributaries of the Columbia between its estuary and the mouth of the Washougal. Listed fish from the above-named ESUs will be present in all these areas and “may be incidentally affected by the program.”

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

The status of the current listings (proposed) include the hatchery population and available status information accompanies both. Information throughout the HGMP describes hatchery release locations and weir sites. Other sections throughout the HGMP (2.2.3) attempt to describe both spatial and temporal distribution. The potential negative impact for all Columbia ESUs are contained in section 3.5 (Ecological Interactions).

Comment # 76 Section 2.2.2

The response should include appropriate descriptions of the Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. The status descriptions provided do not identify whether the information requested in this section is available for those ESUs. Without estimates of annual juvenile production and basin capacity, the HGMP cannot provide an accurate description of the scale of proposed hatchery-releases relative to the production and capacity of listed fish in the basin or basins. The HGMP should provide the relevant estimates for affected populations in the Lower Columbia River chinook, LCR steelhead, LCR coho (proposed for Threatened listing), Columbia River Chum, Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. Estimates should also be provided for total hatchery releases likely to be present in the relevant areas of the Columbia mainstem, so the proposed program’s contribution to the overall scale hatchery releases in the mid and lower Columbia basins can be evaluated.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. NOAA’s cumulative effects analysis will be evaluating this.

Comment # 77 Section 2.2.3.

The response presents a relatively thorough attempt to describe program activities that may impact listed populations, and the risks of those impacts. This is a major improvement over previous HGMPs submitted by WDFW for public review (see *Comments on WDFW Chinook, Coho, and Steelhead Hatchery and Genetic Management Plans for Puget Sound*; Washington Trout, August 1, 2003).

However, we believe the response still fails to address several relevant issues in sufficient detail, relies on some unsupported and sometimes contradictory assumptions, ignores and/or dismisses impacts to neighboring ESUs, and is inappropriately sanguine about the risks inherent in the scientific uncertainty that the response acknowledges surrounds some of these issues.

Broodstock Program

The response asserts that various harvest, brood-collection, acclimation, and release strategies limit the genetic impacts to listed fish from the program. The assertions are unsupported, and/or based on unproven assumptions. The response does not include information regarding the percentage of HORs present in natural spawning areas. That ratio would provide a clear indicator of the performance of the described efforts to limit genetic impacts.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 78 Rearing Program

Information provided about fish-passage and intake screening is confusing, but seems to imply that facilities may be out of compliance with NOAA fish screening standards. The HGMP does not include discussion of remedies or timetables other than a cryptic reference to “forwarded” funding requests for “needed improvements.”

The response includes information about water quality permitting and monitoring, but none about applicable water-quality standards or program performance relative to those standards or any other conditions of the relevant permits. The types or amounts of effluent discharged from the hatchery facility are not listed.

Information about disease transfer is vague, if not to say unsettling. The “significant” consequences of outbreaks are described, but little useful information is provided regarding the history of or potential for disease transfer at this facility, other than cryptic indications of “greatly improved” health conditions and success at “reducing” disease outbreaks. What are the pathogens involved? How often have disease outbreaks occurred? What were the consequences? If performance in this regard has improved, by what measure, by how much, and for how long?

Response: WDFW agrees that more information is valuable and may be added in the future. Concerns such as disease are covered in other parts of the HGMP, such as in Section 9.2.7. Effluent monitoring reports can be requested through the NPDES permitting system.

Comment # 79 Release Program

The response provides relatively detailed information intended to support WDFW’s assertion that competition and predation impacts can be effectively minimized by juvenile-release strategies currently employed at most WDFW hatchery programs,

including those proposed in this HGMP. However, the response is weakened by a reliance on some unsupported and sometimes contradictory assumptions, its failure to consider impacts to neighboring ESUs, and its inappropriate reaction to uncertainty.

The response acknowledges that “Salmon and steelhead feed actively during their downstream migration (Becker 1973; Muir and Emmelt 1988; Sager and Glova 1988) and if they do not migrate they can compete with wild fish,” but then presents information and references to support the assertions that wild and hatchery juveniles are effectively segregated by some behavioral and habitat-preference differences between hatchery and wild juveniles, and “rapid” downstream migration of hatchery juveniles released as smolts.

The response states that, “WDFW is unaware of any studies that have empirically estimated the competition risks to listed species posed by the program described in this HGMP.” This statement is repeated or paraphrased several times throughout the response and in nearly every HGMP. In fact the bulk and substance of the response is repeated essentially verbatim in nearly every HGMP. In the absence of such a narrow study, the HGMP invests a high degree of confidence in “studies conducted in other areas (that) indicate that this program is likely to pose a minimal risk of competition.” At best the referenced studies “suggest” support for the relevant assertion; they do not “indicate” anything in this context. But never mind semantics; without due consideration of studies in “other areas” that may suggest a potential for more than “minimal” competition-impacts from the proposed program, WDFW’s value-standard risks a bias toward particular assumptions about program performance.

The response acknowledges that releases will occur during periods of low to moderate flow, in the middle of the outmigration period for listed juvenile chinook. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department’s own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This suggests it would be extremely unlikely in this case that hatchery smolt releases can be scheduled to temporally segregate them from all wild emigration unless hatchery releases occur in late August or early September. The response fails to acknowledge or address the likelihood of hatchery juveniles interacting with rearing juveniles of other listed species/populations, including populations that employ life-history strategies that include multi-year freshwater rearing.

The response relies on findings in Flagg et al that “it is unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the

estuarine environment.” But it does not discuss current work in Puget Sound that strongly suggests hatchery and wild juvenile salmonids are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings. These data should warrant some discussion and analysis in this context, insofar as WDFW is relying on studies in “other areas” to support the assertion that it can successfully minimize adverse impacts to listed populations by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

The response makes a reasonably strong case that temporally and/or spatially segregating hatchery juveniles from listed juveniles can reduce or minimize competition-impacts to listed juveniles in freshwater habitats. However, the response rather overstates the conclusiveness of the evidence presented to support the assertion that wild and hatchery juveniles are being effectively segregated by the release strategies described in this and other HGMPs currently available for public review. The response acknowledges uncertainty about the level of interactions between hatchery and wild juveniles in the Columbia estuary, and about the consequences of those interactions.

The response acknowledges a high likelihood of interactions between hatchery smolts and listed juvenile steelhead, chinook, and coho. The response appears to acknowledge a high risk of predation to listed juvenile chinook and coho. The response does acknowledge that listed juveniles likely to interact with planned hatchery releases will be present in sizes within prey-size for hatchery smolts by WDFW’s standard, and well within likely prey-size by other potentially more appropriate standards. No information is provided on the in-basin production of wild listed juveniles, relative to the 60,000 hatchery steelhead-smolts (and the sum of all other hatchery releases in the basin), in order to evaluate the likely scope of

potential competitive or predation interactions. The response ignores the potential for encounters with listed juveniles of other ESUs that may be rearing and/or migrating in the mainstem Columbia or its estuary, even though it acknowledges that encounters with LCR chinook, LCR coho, and LCR steelhead could occur in the Columbia mainstem. The admission that “it is unknown to what extent listed fish are available both behaviorally or spatially on the migration corridor” underscores the necessity of considering ecological impacts to other ESUs in the migration corridor, given the admission early in the response that “salmon and steelhead feed actively during their downstream migration.”

The response acknowledges a high level of scientific uncertainty regarding the frequency of competitive interactions between hatchery and wild juveniles, and in determining the consequences of those interactions. But the reaction to that uncertainty is inappropriate.

When faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from data gaps or uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- assumptions should be employed that risk over-estimating rather than under-estimating the level of take. The estimation process ought to be more concerned with providing reasonably low probability of making a Type II error than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no or little take. The HGMP is simply more concerned about wrongly over-estimating a level of take than it is with failing to guard listed juveniles against a credible risk. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

While the HGMP makes a reasonable case that evidence exists to suggest that impacts from competitive interactions between wild and hatchery juveniles are difficult to quantify, it fails to make a compelling case that these risks can be dismissed.

In identifying and analyzing risk factors for competition and predation, the response fails to adequately address several relevant issues. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. The relative sizes of released hatchery smolts and wild listed juveniles should be specified and then evaluated with respect to potential levels of competition and predation. While the response provides some of this information, it fails to specify the expected *distribution* of sizes of released hatchery smolts and of wild

listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume (or imply) that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes are needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response is significantly weakened by its failure to include evaluations of the likelihood of competitive interactions with juvenile salmon and steelhead from the Mid Columbia River steelhead, Upper Willamette River chinook, and UWR steelhead ESUs. For instance, evaluation of risks to listed fish from predation focuses its analysis on the likelihood of interactions and relative body size between program releases and LCR chinook, coho, and steelhead in the Washougal basin. This leaves too many significant issues completely unevaluated. For instance, how will the relative body size of listed chinook, coho, chum, and steelhead juveniles likely to be rearing and/or migrating in the lower mainstem Columbia or its estuary during the period that program releases will be outmigrating bear on predation and/or competition impacts attributable to the program?

The risk of take from potential genetic impacts should be analyzed in the context of hatchery releases. No information is provided about spawning interactions between HORs and NORs, but sufficient evidence exists to also suggest that HORs from the proposed program could be straying to natural spawning areas both within and among subbasins in the Columbia Watershed. The HGMP for the Kalama Fall Chinook Program acknowledges as much in Section 6.2.1 (“strays from other hatcheries within this GDU are common”). The potential for spawning interactions between program HORs and wild listed steelhead in Columbia River tributaries within the LCR ESU should be evaluated.

Response: Comment noted. Steelhead are reared to a size that significantly contributes to smolt-to-adult survival and ensures rapid downstream migration. Listed steelhead spawning habitat is segregated temporally from hatchery steelhead. The HGMPs in section 2.2.3 provides much of the same information stated here.

A number of efforts will be on-going to integrate populations (AHA, BRAP and LCFRB Subbasin Planning). All will review the implications and concerns the reader has in these sections.

Comment # 80 Monitoring

Given the uncertainty and difficulty the response acknowledges in determining levels of impact to listed fish from almost all program operations, we are disappointed not to see a discussion of monitoring or evaluation plans designed to fill relevant data gaps in these areas.

Response: Comment noted. WDFW is reviewing current monitoring efforts to prioritize them for Lower Columbia recovery strategies, overlaying assessments for hatchery requirements and incorporating current monitoring into an overall plan.

Comment # 81 Projected Take

No attempt is made to estimate the level of take, yet this is what is explicitly requested in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

“Under the broad definition of ESA, ‘take’ of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When ‘take’ of a listed species is expected in the hatchery operation, the ESA *requires* that a numerical estimate be quantified as best as possible.” (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NOAA, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center’s assistance if necessary in making these critical assessments.

The response regarding contingency planning provides boilerplate assurance (pasted into HGMP after HGMP) that if WDFW monitors any “additional” or “significant” mortality among listed salmonids, it will seek “guidance” and “determine an appropriate plan.” It amounts to little more than a commitment to do something. The term “additional mortality” is meaningless in this context, as the

HGMP steadfastly refuses to present any quantitative estimates of current mortality levels from the program. The response should include a list of predetermined management options for response to specific performance indicators regarding levels of take attributable to the program.

Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for reacting to circumstances where impact thresholds are exceeded.

For instance, a suite of potential response-options should be developed for a range of potential circumstances including levels of interaction between hatchery and wild listed-juveniles above or between a series of predetermined thresholds, or levels of HORs present in natural spawning areas with listed conspecifics above or between a series of predetermined thresholds. Monitoring and evaluations plans adequate to generate, analyze, and act on the relevant data should be developed and described.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data indicating that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Response: Comment noted, additional information would be valuable and may be provided in the future, also see response to general comment #3.

Comment # 82 Sections 3.1 and 3.2

As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles in each affected basin or subbasin as well as to the total number of hatchery juvenile releases planned for the whole of the MCR, LCR, and UWR ESUs. It does not seem possible to adequately describe or characterize either the magnitude of a particular hatchery program or its relationship to other management objectives without providing a sense of the scale of the total planned production of hatchery juveniles in the mid and lower Columbia River, relative to the estimated numbers of listed juveniles likely to be present in those same areas.

The responses fail to actually “describe (the) alignment of the hatchery program” with any of the documents, policies, or plans listed, or discuss any “deviations from the plan or policies.” They merely assert that hatchery operations are “consistent” with a list of plans.

WDFW’s own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State. WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Independent Scientific Advisory Board of the NW Power Planning Council released in 2003 a *Review of Salmon and Steelhead Supplementation* for the Columbia Basin. The ISAB’s Review provides an exceptionally valuable blueprint for significant and positive reform of Columbia Basin hatchery programs in general, particularly in the context of qualifying those programs for take authorization. The ISAB noted explicitly that, “most (Columbia Basin) hatchery programs are not integrated with natural production because they rely extensively on fish of hatchery-origin for their broodstock. Nevertheless, the hatchery productions from these programs are present in large numbers on the breeding grounds of many natural spawning stocks. In some cases this is deliberate; in others it is inadvertent. Either way, this constitutes a supplementation action.” In other words, the findings and recommendations of the review should be applicable to most if not all programs throughout the basin. We repeat our recommendation that WDFW align the development of this and all other HGMPs currently available for public review with the *Review of Salmon and Steelhead Supplementation* (ISAB; 2003) See comments on Section 1.16, above.

Response: Comment noted additional information would be valuable and maybe provided in the future; also see response to general comment # 4.

Comment # 83 Sections 3.3 and 3.3.1

The response provides little of the information requested by the HGMP Template. The response provides no information about the integration of this hatchery program with the harvest management processes described. The Template requests quantitative evidence of the fishery benefits actually provided by a particular hatchery program, including estimates of future rates, and of harvest impacts on listed fish. The response provides Sport Harvest levels for the years 90/91 – 01/02. The mean harvest level of 827 is the identified performance indicator for the program. See comments on Sections 1.10 and 1.12.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section. After re-reading this section of the HGMP, WDFW believes it has provided the requested information.

Comment # 84 Section 3.4

An estimate of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production should be provided in response to this section. Broad descriptions are provided of major limiting factors to natural production and capacity, and of local and regional efforts to identify and redress limiting factors, but no estimates of natural-production benefits from those efforts are provided. The response describes EDT and its potential applications, but it does not describe how it has been applied in the Washougal Basin or what if anything it has determined.

These factors are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this section is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Response: WDFW agrees that increased information is valuable although it exceeds the requirements of the HGMP in this section.

Comment # 85 Section 3.5.

The response acknowledges that “co-occurring natural salmon and steelhead populations in local tributary areas and the Columbia River mainstem corridor areas could be negatively impacted by program fish.” It identifies fish from all Columbia and Snake Basin ESUs as being of “primary concern” in this context. This should be reconciled with other sections of the HGMP (see sections 2.2.1 – 2.2.3). The response asserts, “listed fish can be impacted thru a complex web of short and long term processes and over multiple time periods which makes evaluation of this a (sic) net effect difficult.” As noted above, the admitted difficulty of determining impact levels does not justify giving up the search, or dismissing obvious risks of impacts. The response states, “WDFW is unaware of studies directly evaluating adverse ecological effects to listed salmon.” The statement appears to be a reference to earlier statements that WDFW is unaware of studies directly evaluating adverse ecological effects *from this program* to listed salmon. That is not the relevant issue. The relevant issue is whether or not particular or cumulative risks rise to a level that negative impacts would be likely. In the case of

this program, the risks of several types of significant impacts to naturally occurring listed populations would appear to be high.

The list of potential positive impacts from the program include some highly conjectural and controversial items. This review has never before encountered the assertion that “the hatchery program may be filling an ecological niche in the freshwater and marine ecosystem.” The supposition that, “migrating hatchery fish may overwhelm predator populations, providing a protective effect to the co-occurring wild populations,” has to be weighed against the at least equally plausible conjecture that large, consistent annual releases of migrating hatchery fish attract, maintain, and potentially increase predator populations in areas where they will be likely to encounter listed salmon and steelhead, thereby increasing predation impacts on those listed populations. Evidence surrounding bird-predation of juvenile salmon in the lower Columbia mainstem might support this latter conjecture. WT concurs that nutrient-loading with salmon carcasses can potentially stimulate stream productivity and provide some ecological benefit for several species. But there are risks involved, and at any rate the response does not discuss how the release of 60,000 steelhead smolts will create meaningful, sustainable nutrient distribution throughout the basin.

Response: Comments noted. Current return rates have increased in past years. In many systems where hatcheries are located, carcasses are being distributed in upper river sites or tributaries. Although a given year can have a return beyond hatchery broodstock needs, this can lead to increased harvest opportunity, additional fish available for nutrient enhancement or carcass surplus options (food bank).

Comment # 85 Section 4.1.

The response does not adequately describe the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described. The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

Response: Comment noted, additional information would be valuable and may be provided in the future, although important limitations to program goals such as temperature problems are included.

Comment # 86 Section 4.2

The response acknowledges that the Skamania intake is out of compliance with NOAA standards and the fish passage appears to be impeded. Funding has apparently been requested, but the status of the request is not discussed, and no timeline for bringing the facility into compliance is provided.

Regarding water withdrawal and effluent discharge, the response does not describe actual risk aversion *measures*. At best, it describes authorities and/or documents that could govern potential risk aversion measures. The NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by hatchery facility location and operations. Relevant issues regarding effluent discharge that should be addressed in this subsection include: stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.

Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described. The results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters.

Response: The Department of Ecology has regulatory responsibility for implementation of the Clean Water Act in Washington, including the National Pollutant Discharge Elimination System (NPDES). WDFW facilities are typically operated under a general permit for ‘Upland Fin-fish Hatchery and Rearing’. The permit specifies the water quality parameters, sampling protocols, and reporting requirements for each permitted facility. Monthly and annual reports on water quality sampling and the use of chemicals at WDFW facilities are available from the Department of Ecology.

Comment # 87 Section 11.1

As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response does little more than very broadly describe the parameters that should be monitored and why. It does not describe how the parameters will be monitored. The response is not presented in the requested format, and does not appear to reconcile with all the performance “standards” and “indicators” presented in Section 1.10 (see comments on Section 1.10).

As noted throughout this review, a monitoring and evaluation plan should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. No monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be evaluated.

In its *Review of Public Comments Received on Puget Sound HGMPs (2003)*, WDFW concurred with public comments that “Detailed description of the monitoring plans and methods related to the performance indicators is not provided,” and pledged to provide “additional details” for PS HGMP monitoring plans during the development of an Environmental Impact Statement on the overall PS hatchery program. Washington Trout submitted significant, substantive comments to WDFW regarding the unacceptable lack of detail in monitoring and evaluation plans in PS HGMPs, largely paralleling the relevant comments in this review. As far as we are aware, the public has not had opportunity to review any “additional details” regarding the monitoring plans for PS hatchery operations. However, this and other HGMPs currently available for review lack any significantly informative descriptions of the monitoring and evaluation plans associated with each proposed program. WDFW has so far failed to clearly demonstrate just how much it concurs with public input regarding this issue.

Response: WDFW concurs and will provide additional details as the HGMPs are augmented during the iterative, ongoing review leading to the distribution of the Final Environmental Impact Statement.

Comment # 87 Section 11.1.2

The response appears to acknowledge that some monitoring activities will be exposed to budget limits.

Response: Comment noted.

Comment # 88 Conclusion

The HGMP unfortunately provides no reason to believe that levels of take of listed species attributable to the proposed program are being or will be effectively contained, or that hatchery benefits justify those impacts. The HGMP commits to NO readily identifiable, measurable, or appropriate performance standards or indicators. It fails to identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The HGMP process offers the opportunity to evaluate several broad factors including: the justification for a particular hatchery program; the social, cultural, and economic benefits of the program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted.

The justification for the program is at best inadequately described. Risks of several types of adverse impacts to listed populations from the program described in this HGMP appear to be high. Measures to minimize take are either inadequately described or based on assertions left unsupported. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

In our judgment, the application is inadequate to justify take authorization under the criteria enumerated in the 4d Rule.

Note:

Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Response: WDFW finds the overall review and responses to many of the HGMP sections to be helpful and informative. Additional assessments of hatchery operations, environmental impacts with the natural environment and fish would be valuable but are dependent on many factors beyond current hatchery and program capabilities. The current Columbia river system Artificial Production and Review Evaluations (APRE) and HGMP processes are a way to identify funding priorities and needed changes. WDFW will be updating HGMPs in the future and will work with NOAA and the Recovery Boards in order to supply the information as needed.

References (provided with WA Trout comments)

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- Conner, E. and D. Pflug. 2003 Changes in the Distribution and Density of Pink, Chum and Chinook Salmon Spawning in the Upper Skagit River in Response to Flow Management Measures; North American Journal of Fish Management. (Accepted for publication, in press)
- Pearsons, Todd N. and Anthony L. Fritts. 1999. Maximum Size of Chinook Salmon Consumed by Juvenile Coho Salmon. North American Journal of Fisheries Management 19: 165-170.
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- Washington Department of Fish and Wildlife (WDFW). 1997. Final environmental impact statement for the Wild Salmonid Policy. Washington Department of Fish and Wildlife, Olympia, WA.
- Wright, S., M. Fraidenburg, and R. Brix. 1973. Observation and marking of juvenile chinook salmon in the Humptulips River, Washington. The Progressive Fish-Culturist 35(3):154-156.
- Wright, S. 1993. Fishery management of wild Pacific salmon stocks to prevent extinctions. Fisheries 18(5):3-4.

Attachments (were provided to WDFW)

1. *Review of Salmon and Steelhead Supplementation*; Independent Scientific Advisory Board , June 4, 2003 (ISAB 2003-03)

Available online

<http://www.nwcouncil.org/library/isab/isab2003-3.htm>

2. *Report for the RSRP Meeting Held July 21-23, 2003*; Salmon Recovery Science Review Panel (RSRP; 2003)

Available online

http://www.nwfsc.noaa.gov/trt/rsrp_docs/Hatchery_Experiments_Final_Report.pdf