COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
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Dear Brigadier General Grisoli and Mr. Wright:

The Columbia River Inter-Tribal Fish Commission (CRITFC) [1] was created by the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes and Bands of the Yakama Indian Nation and the Nez Perce Tribe. These four tribes possess rights reserved by treaties with the United States to take fish destined to pass the tribes' usual and accustomed fishing places. Among these fish are the anadromous species originating in the Columbia River and its tributaries.

CRITFC appreciates this opportunity to comment to the Corps' and BPA's March 30, 2004 Preliminary Proposal for Federal Columbia River Power System Summer Juvenile Bypass Spill Options (federal spill proposal). If implemented, this proposal would eliminate summer spill in July and August required under the 2000 FCRPS Biological Opinion Reasonable and Prudent Measure[2] for a three year period. We have reviewed this document and the Action Agency Response to Comments on the Summer Spill Proposal issued on April 2, 2004 and provide the following general and specific comments on these documents.

Our comments are preliminary. After months of discussions about several different proposals to curtail summer spill, now the federal agencies have allowed the region only three working days to respond to a specific proposal to curtail summer spill with offset proposals. The

[1] The CRITFC was formed in 1977 per formal resolution of the four tribes' governing bodies. The Commission is comprised of elected and appointed tribal officials who are members of the respective tribal fish and wildlife committees. The Commission has technical and legal resources that provide assistance to the tribes in protecting and enhancing their federally reserved trust resources.

[2] The 2000 FCRPS BiOp calls for spill at Ice Harbor, John Day, The Dalles and Bonneville dams throughout all of July and August. The federal spill proposal calls for curtailing Ice Harbor spill around July 16, and curtailing all spill at John Day, The Dalles and Bonneville dams during all of the month of August. In contrast, the 2004 CRITFC River operations plan (attached as Attachment A) calls for spill at all eight Corps dams in the Snake and Lower Columbia Rivers from July 1- September 15.

region submitted detailed comments in February 2004 on the suite of federal spill proposals presented at that time. The federal agencies provided a response to these comments on April 2. It is unreasonable to expect CRITFC and its member tribes to present a final response to these proposals in only three working days, thus we will provide additional comments within a reasonable amount of time.

General Comments

We have structured our comments in opposition to the federal spill curtailment proposal to:

- Describe the importance of protecting and increasing anadromous fish production through the use of spill to our tribes' cultural and treaty reserved resources.

- Provide the scientific rationale for the need for spill at Corps dams with appropriate monitoring protocols and critiquing the federal proposal to curtail spill and offsets.

The federal proposal would impact both naturally spawning and hatchery salmon, sturgeon and Pacific lamprey. No one has more vital interests aligned to the salmon resource than the tribes. While some disparage the value of hatchery-reared salmon, there is no "bright line" between the value of these salmon and naturally produced salmon. In terms of the federal government's obligations to the CRITFC tribes' treaties, there is no difference between a hatchery salmon and a naturally produced salmon. This principle has been upheld in federal courts and in the *United States v. Oregon* proceedings. The right of tribes to fish must not be subordinated to other economic interests such as competing fisheries, irrigation storage, or power demands.

Every additional adult salmon available for tribal harvest is critical from a tribal cultural and use perspective. Tribal members are dependent on these salmon for ceremonial and subsistence uses. These salmon comprise a critical portion of sustenance for tribal members.

Since much of the salmon wealth has been taken away from the tribes and redistributed to non-tribal people in the form of flood control, navigation, irrigation and municipal development, tribal people have experienced elevated poverty and death rates well in excess of the general population and are very dependent on harvested salmon, or indirectly on the small income that salmon harvest provides for survival (Ch2 M Hill 1999). In particular, the loss of salmon and Pacific lamprey from construction and operation of the federal Columbia River Power system has transferred the sustainable wealth created by the river away from tribal peoples and has distributed this wealth to non-tribal peoples (CH2 M Hill 1999). Also, salmon and Pacific lamprey are the mainstay of tribal religious and cultural practices. Every juvenile salmon and lamprey that survives hydrosystem passage through spill has the potential to bring back some of the river's wealth to the tribal economy and culture.

The federal agencies are proposing to eliminate summer spill without full regional support and contrary to specific requirements of the 2000 FCRPS Biological Opinion. There is no biological basis for the abandonment of the BiOp spill, especially since the region has not completed evaluation of the curtailment of 2001 summer spill by COE in terms of life-cycle

survival and productivity of listed and non-listed anadromous fish. The federal motivation to pursue spill curtailment appears to be solely a financial concern relating to revenue foregone to BPA from providing summer spill, despite BPA's current vastly improved revenue stream, compared to that in 2001. Records indicate that BPA's 2003 income was greater than all but three or four previous years in its history.

The 2004 federal spill proposal must be placed in a historical context and considered in light of the evaluation of the 2001 summer spill curtailment impacts on anadromous fish. In 2001, BPA declared a financial emergency and the Corps curtailed 2000 FCRPS Biological Opinion summer spill, over the strong objections of CRITFC and its member tribes. In meetings with the federal executives, CRITFC and its member tribes raised the issue that the loss of the 2001 outmigrating juvenile year class would ripple through several succeeding brood years. The evaluation of the impacts of curtailing spill in 2001 is still ongoing, and it would be premature and pose a serious risk to the future of the Columbia River anadromous fish resource to curtail spill again before the full impact of the 2001 spill curtailment can be fully evaluated. Age class analyses performed by CRITFC at Bonneville Dam indicate that last years' fall chinook adult returns (three year olds that outmigrated in 2001), were substantially lower in abundance than the preceding two years.[3] By the end of October 2004, the data for the four year old component of the 2001 juvenile fall chinook outmigrants will be available. Because the four year old component is normally the most abundant of any fall chinook brood, it is critical that these adult returns be evaluated in respect to environmental conditions present during their life histories before embarling on a risky no-spill strategy.

We have serious concerns that there is no specific evaluation program in place to monitor and determine the biological impacts of the federal proposal to curtail 2004 spill. This is counter to the Northwest Power and Conservation Council's 2003 Mainstem Amendment to the Fish and Wildlife Program that calls for the federal agencies to consult with the state fish and wildlife agencies and tribes and the Independent Scientific Advisory Board, *"…[i]n a rigorous evaluation of the biological effectiveness and cost of spillway passage at each project and bring that information to bear in a systematic way in decisions when and how much to spill…."*. For example, there are no proposals to PIT-Tag, radio-tag summer migrants or implement hydroacoustic or sonar methods to gain system-wide evaluations on the impacts of the spill curtailment proposal. The attached technical memorandum from the Fish Passage Center to CRITFC and WDFW dated April 7, 2004 (Attachment C) describes the importance of an appropriate summer spill evaluation. A critical consideration is that a evaluation of the effectiveness and survival of summer migrants through the Lower Granite removable spillway weir is conducted this summer. Otherwise, critical time will be lost in gaining support of constructing these weirs at other dams and preparing for a vital salmon evaluation called for by the region and the 2000 FCRPS Biological Opinion that compares RSW/spill (in-river passage) and juvenile transportation.

It is important to consider that spill is regionally undisputed as the safest means of anadromous fish passage through dams as stated by the Independent Scientific Advisory Board,

[3] Considerably higher than average adult fall chinook returns from 1998 and 1999 broods are likely the result of good ocean survival. Good ocean conditions occurred for the 2000 fall chinook brood that outmigrated as juveniles in 2001, but a magnitude fewer adults returned in 2003 (Attachment B).

the 2000 FCRPS Biological Opinion and the Washington Department of Fish and Wildlife. Reduction or curtailment of summer spill is inconsistent with the federal agencies' "aggressive, non-breach" option that is currently being implemented and has been upheld as a place holder by the federal district court as a new biological opinion is being crafted to remedy deficiencies under the existing opinion. Because of the value of spill as a recovery and mitigation tool in the presence and operation of the federal dams and reservoirs, CRITFC has consistently recommended increases in spill at federal dams in both percentages and timing to reduce juvenile and adult fish passage through turbine and screen bypass systems that have a high direct and indirect mortality load (CRITFC 2004 River Operations Plan). Analysis by the State, Federal and Tribal Fishery Agencies Joint Technical Staff (June 13, 2003) indicates that a substantial number of listed and unlisted wild and hatchery fall chinook migrate in the Columbia and Snake Rivers beyond the August 31 end of spill in the 2000 FCRPS Biological Opinion and could substantially benefit from increasing spill duration at federal dams.

As stated to Mr. Wright in the Commission's July 23, 2003 letter regarding BPA's proposal to curtail summer spill for the second half of August, 2003, twelve salmon stocks would be impacted by such an operation. As stated in the February 20, 2004 State, Federal and Tribal Fishery Agencies Joint Technical Staff, Pacific lamprey and sturgeon would also be impacted by spill curtailment.

The Commission and its staff have reviewed the federal agencies' analyses and assumptions that generated salmon loss estimates for the federal spill proposal. We strongly disagree with the incremental benefits approach the federal agencies are using to determine the implementation of mitigation measures of a single action, and minimizing those impacts as discrete from the full biological requirements of all of the andromous fish stocks that would be affected. As is explained in more detail later in these comments and comments from outside agencies,[4] the BPA SIMPAS model analysis is significantly flawed in several respects. These include, but are not limited to:

- Failure to include a life-history approach

- Lack of an integrated ecosystem and cumulative affects approach. For example, water quality, disease, and flows are not considered in the analysis. This is contrary to the ecosystems approach included in both the Northwest Power Planning Council Fish and Wildlife Program and the NOAA Biological Opinion and an ecosystem approach recommended in *Return to the River* (ISG 1996).

- Failure to evaluate adult fallback loss from spill curtailment. CRITFC analysis using fallback rates in 2001 operations under no spill indicates that 11,852 adults could be lost under the federal spill curtailment proposal. (Attachment E). This includes both ESA listed and unlisted fall chinook and steelhead. Low abundance of listed steelhead and fall chinook has and continues to restrict tribes from achieving their treaty-reserved share of

[4] Fish Passage Center's December 17, 2003 memo to CRITFC (Attachment D); February 20, 2004 Joint Technical Staff response to the federal spill curtailment; Oregon Department of Fish and Wildlife February 20, 2004 response to spill curtailment; the April 7, 2004 Fish Passage Center comments on the federal spill proposal (Attachment C).

unlisted fall chinook. The tribes have severely restricted their harvests of steelhead and fall chinook to allow pass-through of adults to spawning areas to rebuild these stocks. Additional harvest of these fish by the FCRPS by curtailing spill places the conservation burden squarely on the tribes.

- Failure to consider selection against critical stock genetic make-up and biodiversity. For example, tagging studies by the USGS indicate that the later migrating Hanford Reach juvenile fall chinook contribute disproportionately to older, larger age classes. These older, larger and more fecund age class fish are greater contributors to ocean and in-river harvest and are major contributors to the spawning areas. Summer spill would select against this life history type.

- The BPA analysis is counter to empirical smolt-to-adult information. The BPA analysis predicts greater smolt-to-adult survival from multiple screen bypass, when empirical information indicates the opposite. Further, the BPA analysis shows a positive response to transportation when empirical evidence indicates that many more adults return from juvenile salmon that are left in-river than are transported.

- The BPA analysis assumes static and unrealistic operational conditions throughout all of the proposed spill curtailment period. The BPA analysis only used average year flows and calculated a highly optimistic pool survival and fish passage distributions based upon average year flows. [5] With the 2004 runoff projection at 75% of normal (January-July at The Dalles) and dropping steadily, it is much more appropriate to use data and information from a historically lower year flow year, such as 2001. Neither the BPA SIMPASS analysis nor the CRISP analysis utilized passage and river data and information from 2001.

Specific Comments

Primary differences between our SIMPASS analysis and BPA's are as follows. Other smaller changes in modeling may be detected. However the main sources of the differences are:

1) We used a range for pool mortality parameters. This parameter is one of the least understood in the model due to the number of variables that can affect it. Furthermore, the model is highly sensitive to changes in this parameter.

   BPA used a 1% change in pool survival at Ice Harbor and John Day and 0.5% at The Dalles and Bonneville. Reviewing information from the Ice Harbor summer evaluations from 2000 – 2003 it has been noted that a 4% loss was detected with a mile of the dam face in 2001 under no spill conditions. We have not received the 2003 data to estimate what the mortality is for the same section of river under a spill operation. The 2000 BiOp assumed a 5% percent increase in pool survival if RSWs and other aggressive non-breach

[5] Both pool mortality and fish distribution are very sensitive SIMPASS model parameters. By only using average year information, the BPA analysis creates fewer fish in the hydrosystem and much greater juvenile survival through the hydrosystem.

options were implemented. Therefore if spill, a primary route of passage, is removed the opposite should be true and a 4% impact could be realized, especially under low flow conditions that would occur in August. With this in mind we used both the BPA pool mortality values and a 4% increase in pool mortality at the same four projects to better understand the range of impacts that could occur. It has been our understanding that this spill curtailment operation may take place for three years. If this is correct then using a range for this parameter and other critical parameters, such as run timing, is imperative since the possibility of encountering adverse environmental conditions in 2004 with projected low runoff is probable and in the future years is very possible.

2) After discussion with NOAA fisheries staff, we updated our pool mortality values with current values; it appears BPA did not.

3) BPA assumed that survival through the Bonneville Sluiceway (corner collector) is insensitive to spill, however, the operation of the sluiceway mandates a 50 kcfs training spill to ensure good egress. NOAA Fisheries staff has decided and we concur that operation of the sluiceway without 50 kcfs spill is too risky to implement (*see* Attached Fredricks memo to FPAC on 2004 operations (Attachment F). Currently we have no data for the operations of this facility. We used the TDA summer sluiceway survival of 95% when spill was not provided at Bonneville as opposed to 98% used by BPA regardless of spill level.

4) BPA used a McNary bypass survival that is very optimistic. The 2003 data indicated that survival from both radio tagged fish and Pit-Tag fish was 89-90%, while BPA appears to have used a 97% survival estimate.

5) BPA assumed a nighttime spill cap of 125 kcfs while we used a value of 140 kcfs with NOAA Fisheries staff concurrence. The 125 kcfs cap is based on a monitoring location that is not representative of project operations at Bonneville Dam; 140 kcfs is a better spill estimate that better representing total dissolved conditions in the river.

Table 1 Estimated Reach Survivals

Reach	BiOp Operation	No Spill Pool 4%	Difference	No Spill Pool 1%	Difference
IHR to Bon	34.6%	24.6%	**10.0%**	27.8%	**6.7%**
MCN to Bon	39.0%	30.4%	**8.7%**	33.3%	**5.7%**
JDA to Bon	42.5%	35.2%	**7.3%**	38.0%	**4.5%**
TDA to Bon	73.2%	59.2%	**14.0%**	62.9%	**10.3%**
Bon	85.1%	77.3%	**7.7%**	79.8%	**5.3%**

RUN TIMING/PASSAGE INDICES:

The other key difference between the BPA and CRITFC SIMPAS analyses is the importance of run timing. BPA used an average value; we employed a range to better estimate the impacts to

an early or late migration. Both 1999 and 2001 had late migrations with large percentages of juveniles migrating in late July and through August. Current water supply forecasts have indicated that we are well below average. Run time is related to numerous variables two of the most important are flow and temperature. With the reduced water supply estimate, flow is likely to be lower than average, further low flows can lead to higher temperatures. However, it is impossible to estimate whether run time will be average, late or early for this year, let alone future years. Therefore a range must be employed to ensure accurate estimates for the impacts of this proposed reduction in spill operations.

The BPA analysis also failed to estimate the number of juveniles that would be impacted that had passed McNary but not passed Bonneville by August 1. The BPA analysis uses McNary run time estimates to determine the number of juveniles that would be impacted after August 1 and the cessation of spill. However, a potentially large number of juvenile could be present below McNary but above Bonneville that would be impacted by this change in operation. Using passage indices at McNary dam for Snake River migrants generated from the smolt monitoring data base, we then calculated a travel time from McNary to Bonneville for these migrants. With the run timing and passage indices at McNary Dam, a potential range of juveniles was generated that would still be above Bonneville, but past McNary (Refer to the Fish Passage Center memo dated April 6, 2004). We were able to estimate that a range of 25% to 8% of the Snake River migrants would still be above Bonneville and below McNary after August 1, based on information from the smolt monitioring data from 1998 to 2003. We then took an equal portion of these fish and routed them through the three lower reservoirs using reach survivals generated from the SIMPASS model.

ADULT EQUIVALENTS:

After estimating the number of juveniles that would be present during the change in spill operations and then routing them through BiOp spill operations and a no spill operations, we estimated the number of adult equivalents that would be lost. Using an smolt-to-adult (SAR) of 0.1 for inriver migrants below Bonneville back to Lower Granite, as suggested in the Bowes (2004), *Review of the Bonneville Power Administration's analysis of the biological impacts of alternative summer spill operations*, we estimated the expected range of adult impacts between the two operations. We used the two upper ranges for pool mortality and run timing to determine the worst case and the two lower ranges for pool mortality and run timing to estimate the least impact that could be expected. BPA used a range of SAR's, from 0.005 to 0.04. The SAR's were applied to both in river and transported fish. However, 0.02 seems to be a value that has been used in most of the presentations throughout the region. The BPA analysis estimated an impact of ~22 Snake River ESA listed fall chinook adults. The following table depicts our estimates of adult impacts.

Table 2: The Range Of Snake River Adults That Would Be Impacted By This Operation

	Upper Range	Lower Range
Total ESU	**720**	**114**
Total ESA	**180**	**28**

Table 3: What This Means In Percent Of Adults For The Expected Return

	Upper Range	Lower Range
Total ESU	**7.3%**	**1.2%**
Total ESA	**10.7%**	**1.9%**

If we applied and SAR of 0.1 for all in river fish and used a delayed mortality of 0.2 and an SAR of 0.015 for transported fish we could expect a reduction in basin adult fall chinook of **118,171 to 17,725.**

COMMENTS ON COMPENSATION (OFFSET) PROPOSALS

We have carefully reviewed the federal agencies' offset, or compensation proposal for the loss of August summer spill. Principally, the federal agencies are suggesting three measures, 1) decreasing northern pike minnow exploitation on juvenile salmon by increased pike minnow catch, 2) reducing Hanford Reach fry stranding by modifying power peaking flows in the Hanford Reach, and 3) reduction of harvest. We offered flow proposals in the *CRITFC 2004 River Operations Plan* to the federal agencies for consideration, as increased flows are the only means of providing in-kind compensation for this years' losses of anadromous fish from the federal spill curtailment proposal. Unfortunately, aggressive pre-emptive drafting of many federal storage reservoirs well below flood control rule curves in the past two months, likely for power generation, has eliminated valuable sources of water for flow measures. We have yet to hear from the federal agencies regarding our flow recommendations in the *River Operations Plan*.

We have focused our comments on the pike minnow "heavy up" and Hanford Anti-stranding proposals because of the detail and inaccuracies included in the action agencies' response to comments and the "Other Mitigation Proposals" found at pages 9-10 of the federal agencies' Preliminary Proposal.

Concerning the Pikeminnow Program: BPA proposes to offset losses of juvenile salmonids by increasing funding for the Northern Pikeminnow Management Program (NPMP), and therefore by increasing catch of pikeminnow. RPA 100 of the 2000 Biological Opinion (BiOp) requires the continuation and improvement of the ongoing NPMP. That means to continue with levels of exploitation at least equal to those prior to 2000. It should be noted that funding for the NPMP in 2004 was reduced by approximately 20% from previous levels, which was estimated to result in a 13% decrease in benefits. The reduction for 2004 and beyond seriously compromised the ability of the NPMP to meet BiOp requirements. The proposed offset will facilitate meeting this requirement, but because some of the funding and effort will be expended as a re-instatement, not all can be justified as a true offset.

Comments on Specific Sections of the Northern Pikeminnow Management Program:

Page 8 - *We are also proposing that the mark-recapture effort, which is the basis for the NPMP evaluation, receive additional statistical review, as recommended by Hankin and Richards (2000).*
Comment: Hankin and Richards (2000) recommended that "statistical methods used to estimate exploitation rates and natural mortality rates both receive a more detailed review from a competent biometrician with special expertise in application of mark-recapture methods". Such a review has already been undertaken and reported (Takata and Friesen 2003). Recommendations from the biometrician have been implemented. All recommendations from Hankin and Richards (2000) regarding NPMP evaluation are being impleneted.

Page 8 – *Additionally, in response to comments concerning potential increases in predation resulting from spill operation modifications, we are proposing the addition of focused removals from Bonneville, The Dalles, and John Day forebays and tailrace boat restricted zones*.
Comment: No details regarding the implementation and evaluation of this strategy are provided. To be effective, these removals must be in addition to a "heavy up" in other areas, not merely part of a heavy up (i.e., replacing catch in a different area with catch in the boat restricted zone). Hiring known sport reward anglers to fish in the boat restricted zone may not meet this requirement. Exploitation must be estimated separately for these focused removals.

Page 8 – *Using the 2001 Power Emergency NPMP as a model for 2004 and beyond and the implementation of focused removal fisheries in the tailraces of select dams, we conservatively estimate an increase in systemwide catch of 15,000 northern pikeminnow. We believe it is reasonable to anticipate the potential for increased catch as high as 40,000 additional northern pikeminnow.*
Comment: This estimate of increased catch contradicts a previous statement on Page 8 – "*In response, we are proposing to more aggressively implement the NPMP to achieve exploitation rates that are in the higher end of the target range (the target range is 10 to 20 percent annual average exploitation), and which in the long-term may be more significant relative to measurements.*" The statements are contradictory because the 15,000 to 40,000 estimate of increased pikeminnow catch has not changed from the hypothesized catch in the previous draft of the summer spill proposal (20,000 to 40,000). The increased catch of 20,000 to 40,000 was assumed to equal a 1% to 2% increase in exploitation. In joint technical comments on the previous draft, the fish managers explained that an increase of such small proportions would be "lost" in the uncertainty inherent in estimates of exploitation and reductions in predation. From 2000 through 2003, pikeminnow catch averaged 17,615 fish (95% confidence intervals = 15,159 to 20, 071) per each percentage point of exploitation rate. At this ratio, an increased catch of 15,000 to 40,000 pikeminnow results in increased exploitation rate of 1% to 3%. Such increases may remain "lost" in the uncertainty.

Northern Pikeminnow Management Program – *Routine NPMP monitoring will assess the effectiveness of this offset, including total annual effort (typically reported as number of angler days), catch per unit effort, exploitation rate, and actual catch compared to projected catch (based on historic performance). Results will be reported annually*.

Comment: Effort and catch per unit effort are NOT performance measures for the NPMP, and therefore are not pertinent to evaluation of the heavy up. These measures may be related to exploitation, but they provide no indication of the NPMP benefits (reductions in predation). Exploitation rate is the performance measure that relates directly to re-structuring of the pikeminnow size distribution, which results in decreased predation.

An effective evaluation of the heavy up will require increased precision in exploitation estimates. Without increased precision, projected increases of 1% to 3% will not be detectible. Precision must be reasonable not only for the NPMP as a whole, but also for the near-dam focused removals, if implemented. The only way to increase precision is to increase the number of pikeminnow tagged each year prior to start of the fisheries. Based on recommendations from the biometrician review (Takata and Friesen 2003), fish should be tagged before removals begin.

Time, personnel, and equipment (boats) currently limit the number of pikeminnow tagged. Time cannot be altered. Effort prior to April is generally not effective because cold water and limited movement of fish. Tagging fish after fisheries begin reduces precision in exploitation rate estimates. It should be noted however, that if all sampling and analyses follow protocols outlined in the biometrician report, increases in precision will be limited:

Fish Tagged	Recaptures	Exploitation Rate	95% Confidence Intervals
1000	120	12.0%	9.9% - 14.1%
1500	180	12.0%	10.2% - 13.8%
2000	240	12.0%	10.5% - 13.5%
1000	150	15.0%	12.6% - 17.4%
1500	225	15.0%	13.1% - 16.9%
2000	300	15.0%	13.3% - 16.7%

Comments on Supporting or Additional Material: When calculating estimated increases in catch resulting from augmentation, baseline data should be restricted to catch from 2000, 2002, and 2003 (exclude 2001). BPA uses data from 2000-04. The minimum size of pikeminnow eligible for payment changed in 2000, precluding use of previous years. The previous augmentation precludes using data from 2001. Catch averaged about 5% less per year excluding 2001 data. This results in estimated benefits from the proposed augmentation being about 5% less than estimated by BPA.

Comments on Hanford Reach Compensation (offset)

The Hanford Stranding compensation benefit estimates are based upon an analysis with extremely limited data that is inappropriately extrapolated to cover the entire 51 miles of the Hanford Reach. Thus, the loss estimates are imprecise so the benefits are correspondingly imprecise. Specifically, data for only eight miles of the Reach was extrapolated to create loss estimates for the entire Reach. The loss estimates for the eight mile section are highly imprecise

with extremely wide confidence intervals. Grant PUD's stranding loss estimates used by BPA in their analysis only accounts for a very small portion of power peaking impacts.[6]

Grant and BPA loss estimates are based upon a limited, random sampling design, where samples were very limited due to restricted sampling effort in a very small portion of the Reach. Further, the sample design and methodology did not fully incorporate entrapment impacts that appear to be more severe than stranding impacts. For example, the study design dictated that an entrapment with many fish could not be sampled if less than 50% of the entrapment was found in the circular sampling area. This caused the key impact of flow fluctuations to salmon trapped in entrapments to be under represented in the samples and resulting loss estimates. However, even this data indicates that small reductions in flow, especially at night when fall chinook fry are susceptible to stranding, can cause very large mortality events. [7]

The Vernita Bar Plus Agreement that BPA has signed as a party allows wide flow fluctuations between 20-60 kcfs. A 20 kcfs flow fluctuation at lower base flows (60-70 kcfs) allowed in the Agreement has been shown to kill over 2 million fry, even with limited sampling in the 8 mile section of the Reach. The overall loss estimate in BPA's analysis is full of assumptions that cannot be verified with existing data available to Grant PUD and BPA. For example, McMichael et al. (2003) upon who derived the estimates: 1) made gross assumptions about Hanford Reach habitat, 2) made assumptions about the stranding potential for that habitat, 3) made further assumptions about the amount of stranding in areas outside their sampling area, and then 4) made assumptions about egg-fry survival based upon egg-fry survival in Wanapum pool instead of the Reach to develop loss estimates.

In 2003, research with a stratified random sampling design concentrating on entrapments throughout the entire Reach conducted by ADFG, CRITFC, USFWS and WDFW, indicated that in excess of 2000 entrapments per day can be formed in the Reach from power peaking activities from the Project and other hydroprojects upstream. Many of these entrapments are formed at low flow fluctuations, such as that which occurred in 2001. Each one of these entrapments may have several hundred fish in them. Fish are exposed to significant mortality from thermal heating, predation and invertebrate populations are reduced. In a spring 2003 comparison between sampling methodologies in the eight mile Reach section, the USFWS has preliminarily estimated a 4-5 fold greater stranding and mortality impact than Grant PUD and that used by BPA in their estimates of benefits. Weekends are usually when the greatest fluctuations occur but they can also occur during the week. For example, the large loss in 2001 occurred from a weekday flow fluctuation. The key portion of the juvenile stranding susceptibility period is about eight weeks.

The evaluation of the stranding reduction operation is limited to samples gathered during only three days a week in the middle section using the same flawed sampling design. Thus, a robust

[6] Power peaking has been shown to reduce adult migration, cause fish passage facilities to be out of criteria and could impact littoral food resources (Agencies and Tribes 1993; Williams et al. 1996).

[7] In 2001, with flows dropping just a few feet, conservative estimates indicate that over 2 million juveniles were lost from power peaking activities. The importance of the Hanford Reach fall chinook stock cannot be overstated. The stock provides about 30% of the Alaska troll harvest, provides harvest to Canada, sport harvest to non-tribal fishers and is the foundation of tribal treaty harvests.

evaluation of possible reduction of stranding impacts for the 2004 Hanford Fall chinook migration is not planned and will not be conducted this year, thus, it will remain uncertain as to what impact flow operations will have on stranding. A robust evaluation in 2004 would include sampling entrapments over the entire Reach with a concerted sampling effort as conducted by ADFG, CRITFC, USFWS and WDFW in 2003.

As CRITFC told BPA representatives at a recent staff meeting, If BPA wants to present a authentic compensation plan for partially offsetting Hanford Reach juvenile stranding losses, they should incorporate the recommendations in CRITFC's 2004 River Operations that limit flow fluctuations to 10-20 kcfs and require all seven Mid-Columbia projects to stay on hourly coordination during the entirety of the juvenile fall chinook susceptibility period and to make this a firm non-power constraint under the PNCA annual planning. In addition, BPA should conduct investigations to:1) purchase of other power sources or water from Canada or US federal entities, and, work with Grant to analyze the storage capacity of Grant's two reservoirs to determine how it can modify flows entering the Wanapum pool. Further, as Grant notes and CRITFC concurs, fall chinook are more susceptible to stranding at night than in the day, because they become sessile and inactive at night and are incapable of swimming with receding flows. To remedy this situation, BPA should work with Grant to move the 24 hour reset period where flow bands are changed from midnight to 4 AM and evaluate the operation with respect to juvenile fall chinook stranding.

Comments on summer spill analysis using CriSP model set forth as an attachment to the Action Agency Response to Comments:

In the "Action Agency Response to Comments on the Summer Spill Proposal", BPA attached an analysis conducted with the CRiSP model that compared survival of summer migrants under alternative spill scenarios. This analysis, however, lacks the specifics necessary for a proper evaluation, and as a result, reported very small changes in survival when spill is reduced or eliminated.

Several weaknesses are evident in the analysis. First, it is doubtful that the model takes forebay delays into account. Lack of spill causes fish to hold in the forebay for several days, exposing them to predation in a predator rich environment. Such increases in predation at reduced spill levels must necessarily be part of any alternative spill analysis. The CriSP modeling appears to rely on juvenile run timing information that is not consistent with the most recent PIT tag data.

Additionally, a spill module in the CriSP model is apparently and inaccurately reducing the survival of fish and, thus, offsetting the survival advantage gained by spilling fish. There is no credible basis for the assumption that spill to the gas cap (120% saturation) would result in mortality. As a justification for assumed mortality, the assessment relies on "laboratory studies". In the 2000 BIOP, NMFS stated that:

> …bioassays had determined lethal TDG levels primarily under shallow water laboratory conditions, which are not representative of the conditions experienced by migrating juveniles. The Columbia River is sufficiently deep throughout the FCRPS that migrants could benefit from depth compensation for supersaturated conditions.

(FCRPS BiOp, p. E-4, dated December 2000). Mortality due to gas supersaturation for summer migrants is not a serious issue because there is no involuntary spill during the summer. Intensive monitoring has shown that incidence of GBT is generally low except for periods of involuntary spill that occur early in the migration season (FCRPS BiOp, p. E-4, dated December 2000).

Comments on "Other Mitigation Actions" Described in the March 30 Preliminary Proposal:

The "Other Mitigation Actions" described in the Action Agencies' Preliminary Proposal are unacceptable as offsets for a reduction in summer spill.

- **Council Fish and Wildlife Program Funding Increase**: The proposal indicates that BPA would consider increasing the funds available for implementation of the NPCC Program by $5 million each year in FY 2005 and FY 2006. The objective seems to be to "benefit stocks affected by summer spill," but the NPCC "may also prioritize projects targeted to stocks that are in greater need."

Comment: The proposal makes no mention of BPA's cuts to Fish and Wildlife Program funding in FY 2002 and FY 2003 or limited ESA funding commitments. The attached correspondence from the Columbia Basin Fish and Wildlife Authority describes the situation clearly:

> In the past year BPA has taken the following actions to reduce funding for the Program:
>
> • Cut over $40 million from the Program by eliminating carry-over funding from previous years.
> • Cut $11 million in Program funding by changing from an Obligations based planning budget to an Accruals based planning budget.
> • Cut nearly $30 million by imposing a strict interpretation of a Capital funding policy.
>
> Although BPA argues that $36 million in borrowing authority is available each year for fish and wildlife projects, the application of their stringent funding criteria resulted in only $6.8 million of fish and wildlife related capital projects actually being funded. As the Council and fish and wildlife managers work to absorb these tremendous reductions to the Program, BPA is now proposing to cut an additional $15 million from the Program budgets.

Letter from CBFWA to NPCC, dated March 26, 2004 (Attachment G)(see also CBFWA Letter to MMG, dated March 25, 2004)(Attachment H)). We note that BPA's prior assertions of funding for ESA actions needed to implement the FCRPS BiOp were also grossly inflated:

> Based on our analysis, the Action Agencies reporting of expenditures in the Expense category of the Fish and Wildlife Program is not supported by the financial data. The report states that an additional $39 million annually (39% of $100 million) "was intended primarily to implement offsite BiOp actions above and beyond those already being implemented under the Council's Fish and Wildlife Program when the BiOp was issued."

> Our analysis of actual FY 2003 expenditures in the Expense category reveals that only $19.7 million consisted of projects initiated between FY 2001 and FY 2003 (new actions since the BiOp was adopted), and only $8.3 million of those projects addressed RPA actions as identified by the NOAA Fisheries. In FY 2002, only $6 million of all projects funded were for projects initiated in FY 2001 or FY 2002, with less than $3 million of those projects addressing RPA actions.

CBFWA letter to Action Agencies, dated February 3, 2004 (Attachment I). Eliminating or reducing summer spill to pay for ESA or Fish and Wildlife Program is worse than robbing "Peter to pay Paul." BPA should restore the funding to assure compliance with the Northwest Power Act and Endangered Species Act without any reductions in summer spill. BPA's failure to meet its ESA and Fish and Wildlife Program funding commitments will only be exacerbated by reducing or eliminating summer spill.

- **Additional Flow Augmentation from Dworshak:** The proposal indicates that additional summer flow augmentation would occur from Dworshak Reservoir.

Comment: As our joint technical comments more clearly describe, more flow improves the travel time and survival of Snake River juvenile fall Chinook. What the Action Agencies' proposal does not indicate is that the Commission and the Nez Perce Tribe have developed a 2004 River Operations Plan that calls for additional summer flow commitments from the Upper Snake, Upper Columbia, and Grand Coulee, but **not from Dworshak and not as an offset to spill**. Dworshak dam is drafted more deeply than any other reservoir in the FCRPS for summer flow augmentation. As it stands, the BiOp already calls for an 80-foot summer draft. Increasing the draft to 100 feet risks refill, unacceptably increases cultural resources impacts, and competes with instream flow needs in September and October. As the Commission's 2004 River Operations proposal describes, the Commission and its member tribes have sought additional summer flows to restore a normative river ecosystem in support of better juvenile salmon survival conditions. The Commission has not proposed doing so as an offset to reductions in summer spill. We have attached the 2004 River Operations Plan to these comments (Attachment A).

- **Tribal Harvest Enforcement Funding:** The proposal contemplates tribal harvest enforcement funding to deter illegal take.

Comment: The Commission and the Nez Perce Tribe have in prior years received funding from BPA to implement an expanded tribal conservation enforcement effort. In the case of the Nez Perce Tribe, enforcement funding from BPA was curtailed in February of this year. CRITFC's enforcement funding contract with BPA is due to expire in May, 2004. The Commission does not believe that restoring tribal law enforcement is an appropriate offset to the elimination of summer spill. The Commission strongly believes that the additional tribal law efforts described in the provincial review proposals (NPT, CTUIR, CRITFC) are meritorious in their own right. BPA's posture of cutting funding for tribal conservation programs (but offering to restore the tribal programs as an offset) on the eve of a policy decision to reduce summer spill strikes the tribes as a very heavy handed approach to coerce the tribes to agree to curtail summer spill. Such coercion is unacceptable.

- **Additional or improved artificial propagation, avian predation research, water acquisitions, and habitat protection:** The proposal suggests without identifying any specific actions that the foregoing measures could help offset survival impacts associated with spill reductions.

Comment: The concept of offsite mitigation is not new to the Commission's member tribes. It is one of the features of the Northwest Power Act. 16 U.S.C. 839b(h)(8)(A). The offsite actions in the summer spill proposal, however, are nothing more than one or two sentence concepts. There are no commitments to make funding available, processes for deciding among projects, or other commitments that would indicate that the offsite measures will occur at all, let alone on a timely basis such that the potential biological benefits would address the impacts that occur to the affected year classes of all impacted salmon stocks.

Non-tribal Commercial Harvest Reductions

Comment: We concur with the correspondence from the Alaska Department of Fish and Game and the Alaska Trollers Association concerning summer spill reductions. Reducing summer spill would be inconsistent with the Pacific Salmon Treaty.

> The '99 Treaty Habitat and Restoration Agreement (Appendix E) was designed to ensure "safe passage" for Columbia River salmon. A strong consensus has developed among the managers that additional harvest management restrictions are not going to help us rebuild salmon stocks, in the face of continued destruction and degradation of salmon habitat. The Habitat and Restoration Agreement captures this agreement of the U.S. and Canada, where both Parties agreed "to use their best efforts to maintain and, as needed, improve safe passage of salmon to and from their natal streams." Your actions, perhaps unknowingly, are inconsistent with the agreement of the U.S. and Canada, as well as, earlier agreements reached by the parties to the underlying action.

Letter from ADF&G to NOAAF, dated February 2, 2004

- **Additional Removable Spillway Weirs:** The proposal suggests accelerating the installation of RSWs.

Comment: The engineering and testing of RSW technology must be undertaken on a dam specific basis. Of the Snake River projects, Ice Harbor is unique. The spillway deflectors at Ice Harbor are much higher than Lower Granite, and the tailrace is much shallower than Lower Granite. Both of these conditions may play a critical role in understanding the spillway survival issues. An RSW will not correct either of these conditions. The RSW testing at Lower Granite continues to make sense since the objective there is to increase FPE by increasing SPE. However, the RSW at Ice Harbor will likely not improve FPE over current conditions. Instead, installing a RSW is an attempt to improve spillway survival over the existing condition and CRITFC remains uncertain how the RSW will accomplish that. By continuing with the fast track of the Ice Harbor RSW the region will be committing at least $7 million of 2005 budget, possibly more depending on study requirements. This is a large commitment of extremely limited Corps' CRFM funds when other critical needs that the tribes have long been advocated, such as temperature improvements at passage facilities, and lamprey research and passage

facilities have suffered from lack of funding. Under any circumstances, accelerating RSW installation and displacing other important CRFM is not appropriate as an offset to the elimination of summer spill. See attached memorandum from CRITFC to NOAAF dated December 12, 2003 (Attachment J).

Review of Recent PIT tag Date Concerning Smolt to Adult Returns and Dates of Passage:

At the request of the WDFW and CRITFC, the Fish Passage Center has compiled an updated analysis of data related to the smolt to adult returns of Snake River fall Chinook, including an updated assessment of run timing. Four areas of focus are described in the memorandum dated April 7, 2004 (Attachment C):

1. Smolt to adult returns for transported and non-transported juvenile Fall Chinook.
2. Adult returns compared to date of passage and spill level.
3. Updated SIMPAS analysis for listed Snake River fall Chinook.
4. A proposal for PIT tag marking subyearling Chinook to improve data on spill and transport effects.

The summer spill proposal does not appear to consider this information. The following summarizes this work and conclusions that are appropriately drawn from the information presented in the memorandum:

Transport SARs: The smolt to adult return data from Snake River field measurement shows very low return data for fall Chinook transported from the Snake River dams. Much better returns are demonstrated by salmon that were not transported as juveniles from the Snake River dams. The data were obtained from fish tagged for other experiments not designed to assess transport effects:
Conclusions: (A) A policy of intentionally allowing a defined percentage of juveniles to migrate in-river (spread the risk policy) for Snake River juvenile fall Chinook is warranted, because existing data indicate that adult returns are much higher for non-transported Snake River fall Chinook. (B) A study designed to assess the effects of Snake River passage conditions (transport and in-river) should be implemented in 2004. (C) Relying on transportation to offset the impacts of spill curtailment would be very risky.

Date of Passage: Juveniles that pass Ice Harbor and McNary dams in August are more likely to produce adult returns than juveniles that pass earlier in July. A large proportion of Snake River juvenile fall chinook that survive to adult pass through the lower Columbia river in August. Juveniles that passed during August in years when flow and spill were greater than average produced the highest number of returns.
Conclusions: (A) All juveniles are not equal and eliminating August spill is likely to impact adult returns in ways that eliminating spill in July will not. (B) A comprehensive juvenile to adult monitoring effort is needed. (C) SIMPAS model analyses do not account for this effect.

Updated SIMPAS Analysis: With numerous caveats, the agencies and tribes have prepared an updated model analysis of the impact of spill curtailment on Snake River fall Chinook.

Unfortunately SIMPAS is the only model currently available to develop quantitative estimates of impacts. BPA estimated adult listed Snake River salmon killed to be from 2 to 22 fish. The updated SIMPAS analysis indicates that 71 to 310 would be impacted from eliminating spill in August. Neither BPA's numbers or the updated numbers are precise.
Conclusions: (A) On a comparative basis impacts to listed Snake River fall Chinook are likely to be an order of magnitude higher than those presented by BPA. (B) To fully offset the impacts to Snake River fall Chinook the offsets proposed by BPA would need to be increased by more than an order of magnitude.

Studies Needed: The data currently available to assess benefits and impacts of summer spill is limited, such that the ability to perform statistically rigorous analysis is difficult. No specific studies have been conducted to assess the effectiveness of Snake River fall Chinook transportation in comparison to in-river routes of passage. It is extremely critical that a RSW test for summer migrants at Lower Granite Dam is conducted this year. The FPC staff have collated the thinking of fish managers and have proposed a marking study to yield adult return data for Snake and other Columbia River stocks. A CSS-like study for fall Chinook would cost several millions dollars per year, but would yield information on transportation and in-river survival.
Conclusions: A life-cycle based study of fall Chinook juvenile migration should be undertaken to assess survival by route of passage (spill, transport, turbine) at Snake and Columbia dams.

Conclusion

The attached resolution of the Affiliated Tribes of Northwest Indians reflects the concerns of the Commission and its member tribes. The Columbia River salmon Pacific lamprey and sturgeon need a healthy river environment. It is the tribes' duty to speak on behalf of the salmon. We urge the action agencies not to proceed with curtailing summer spill. Thank you for the opportunity to comment. We intend to supplement these comments in the future.

Sincerely,

Olney Patt, Jr.
Executive Director

Attachments A-J

cc: Bob Lohn, NOAAF
Rod Sando, CBFWA

References

Takata, H. K., and T. A. Friesen. 2003. Development of a System-wide Predator Control Program: Fisheries Evaluation. Annual report to Bonneville Power Administration.

Hankin, D. and J. Richards. 2000. The Northern Pikeminnow Management Program: An independent review of program justification, performance, and cost-effectiveness.

Attachment A

Columbia River Inter-Tribal Fish Commission

2004 River Operations Plan

Columbia River Inter-Tribal Fish Commission
2004 River Operations Plan

March 3, 2004

Overview

The Columbia River Inter-Tribal Fish Commission (CRITFC) presents the 2004 River Operations Plan (ROP) for the Federal Columbia River Power System (FCRPS), the Hells Canyon Complex and mid-Columbia FERC-licensed hydro-projects including Rock Island, Rocky Reach, Wanapum and Priest Rapids. The ROP is a detailed extension of the mainstem recommendations from the CRITFC tribes' Columbia River Anadromous Fish Restoration Plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Spirit of the Salmon; Nez Perce et al. 1995). The ROP contains recommendations for water management and dam operations, including flows, reservoir elevations, spill, and fish facility operations and is consistent with CRITFC's recommendations on the federal 2004 Water Management Plan.[1] The ROP also contains recommendations for water acquisition. Each of the recommended actions will contribute singularly and cumulatively to increase mainstem anadromous fish protection and survival. Current direct mortality and indirect mortality for Snake River yearling chinook is estimated between 25%-73% and 37%-68% respectively (Budy et al. 2002). If implemented, the recommended actions in this Plan will reduce these significant mortality rates.

Near historical levels of adult salmon escapement in 2002 and 2003 indicate that many juvenile salmon will be out-migrating this spring and summer through the mainstem Snake and Columbia River hydrosystem of 13 dams and reservoirs. For example, escapement estimates for Hanford Reach bright fall chinook indicate that over 30 million fry will outmigrate from the Reach spawning areas this spring and summer. Thus, it is critical that substantial anadromous fish productivity in 2004 be protected through the hydro-system by the implementation of the appropriate river operations contained in the ROP.

The USDA-Natural Resources Conservation Service and NOAA's National Weather Service forecast a 100 million acre feet (MaF) January-July runoff (February final forecast) for the Columbia River at The Dalles or 93% of normal for 2004. CRITFC staff, through independent analyses, forecast a 104 MaF runoff forecast (Table 1).[2]

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[1] These comments can be found in Attachment 5 to this document.

[2] CRITFC uses the experimental one-year streamflow forecast for the Columbia at The Dalles from the University of Washington's Climate Impacts Group (Hamlet and Lettenmaier 2003). That forecast is used in another regression analysis that accounts for the phase of the Pacific Decadal Oscillation. The 2004 runoff forecast compares to a 103 MaF average runoff at The Dalles during the 1929-2003 period of record.

The foundation of the ROP is a normative, natural peaking hydrograph that offers juvenile and adult salmon migrations a more natural flow regime to: 1) reduce time of entry into saltwater, 2) create enhanced water quality conditions in the mainstem and estuary and Columbia River near-ocean plume to enhance critical habitat, and 3) minimize predation and residualization losses (Williams et al.1996; Bunn and Arthington 2002). ROP water management is based upon judicious use of available storage and altered flood control modifications to create a peaking hydrograph in early June at the Columbia at The Dalles to assure flow and increase critical mainstem habitat for anadromous fish.

ROP operations were modeled against actual extant and probable future federal river operations for 2004, based upon the historical flow record and federal operations of the FCRPS since 1995, when the minimum flows of the Biological Opinion was first established. The Northwest Power Planning Council's GENESYS Hydro-regulation model (Version 2.7.1) was used to simulate recommended monthly flow and reservoir elevations at index points in the region.

The ROP uses altered flood control rule curves and additional upper basin storage to create a normative, peaking flow regime for all major river index points (Martin 2004). Peak flow frequency analysis (WY 1929-1978) suggest the average system-wide flood risk for the Columbia at The Dalles (550 kcfs) for the CRITFC plan is 16% versus 14% for Federal operations and 42% for historical observed data. For bankfull flows (450 kcfs), the system-wide flood risk for the Columbia at The Dalles for the CRITFC plan is 50% versus 42% for Federal operations and 62% for historical observed data. When they become available later this spring, the Northwest River Forecast Center's NWSRFS-STP hydro model results, in daily time steps, will be used to update and fine-tune the ROP for spring and summer operations.

The ROP is based upon restoring ecosystem functions and values and assures beneficial flows for anadromous fish, while seeking to maintain higher reservoir levels for resident fish and tribal cultural resource protection. The federal 2004 Water Management Plan lacks any reference to a basin-wide, ecosystem approach to increase productivity of listed and unlisted anadromous and resident fish. Spill is a major component of the ROP consistent with the normative river paradigm (Williams et al. 1996). The spill season in the ROP is extended and enhanced over that required in the NMFS 2000 Biological Opinion for the FCRPS and 2004 Water Management Plan in the spring and summer at most federal dams. The Plan's spring and summer spill recommendations extend spill timing and amounts for Rocky Reach, Rock Island and Priest Rapids and Wanapum dams. These spill levels are an enhancement over levels in the three Mid-Columbia Habitat Conservation Plans and current spill levels provided at Priest and Wanapum dams by Grant PUD.

The ROP also contains specific recommendations and guidelines to: 1) reduce power peaking, 2) enhance adult and kelt passage, 3) enhance water temperature criteria to meet Clean Water Act standards, 4) enhance river conditions for the tribal treaty fisheries, 5) enhance fish facility operations and 5) direct mainstem research. Also offered in the ROP is a list of key fish facility mitigation projects, which, if implemented, could result in significant improvements in fish passage survival. The ROP also offers a water management paradigm that avoids the

weaknesses of week-to-week trade offs common to the Technical Management Team, Implementation Team, and Regional Executive Committee forums.

The storage volume difference in ROP's altered flood control operation and the federal Water Management Plan's standard flood control operation is almost 15 MaF, distributed between Mica, Arrow, Libby, Grand Coulee, Brownlee, and Dworshak projects.[3] The ROP applies this storage to both spring and summer salmon migrants. The federal flood control drafts will likely result in a loss of storage that may impact spring flows and the ability to meet the April 10 refill requirement called for by the NMFS 2000 Biological Opinion for the FCRPS. For example, the federal flood control operations place Lake Roosevelt elevations 29 feet below its flood control rule curve for February 29th, which may reduce Hanford Reach spring flows and contribute to flow fluctuations and stranding losses. Dworshak is 21 feet below its February 29th flood control rule curve. The loss of this storage may also reduce the ability to 1) meet the April 10 refill requirement and, 2) meet McNary spring target flows called for by the NMFS' 2000 Biological Opinion for the FCRPS.

Tribal treaty fishing occurs in all of Zone 6 from McNary to Bonneville dams. The ROP includes water management regulations to promote the treaty fishery during the extremely limited fishing periods. Federal river operations should be restricted to fish and wildlife related actions, flood control and navigation actions. Recreational demands for pool operations during treaty fisheries are of a lower priority and should not conflict with the other actions. Pool elevation restrictions and steady flows should be provided during tribal fisheries for all of Zone 6, not just Bonneville Pool. The federal operators have a trust and treaty responsibility to provide these operations to insure that tribal fishers may successfully engage in the exercise of their fisheries.

Given the droughts in 2001 and 2003, and the extraordinary numbers of juvenile salmon migrating seaward through the hydro-system, it is critical that measures in the 2004 CRITFC River Operations Plan be fully implemented. CRITFC urges the federal government, Idaho Power Company, and the Mid-Columbia Public Utility Districts to seriously consider implementing the recommendations in this Plan.

[3] See Table 2. Results derived with GENESYS model.

Key Plan Recommendations

Decision Making

- The Technical Management Team (TMT) and Implementation Teams are useful for regional information sharing but they do not suffice for river operations decision-making and are not government-to-government forums. CRITFC's member tribes formally withdrew from TMT and other NMFS' ESA forums in 1997, due to the lack of formal government-to-government consultation mandated in various federal agency policies including the 1997 Secretarial Order to the Departments of Interior and Commerce. Further, the TMT is prevented from candid discussions of operational alternatives due to the presence of power marketing agents.[4] To avoid these serious problems, the federal operators and NMFS should use the Columbia Basin Fish and Wildlife Authority as a technical forum to discuss river operations where all 13 Columbia Basin tribes can have meaningful input. Disputed issues should be raised to an executive committee table comprised of policy representatives from the tribes and states and federal entities. Similarly, spill and flow decisions in the Mid-Columbia should be determined in the Mid-Columbia Coordinating Committees established by individual settlement agreements for Wells and Rock Island Projects and under the Mid-Columbia Proceedings established under existing licenses for Rocky Reach, and Priest-Wanapum Projects.

Emergency Declarations

- The definition of "emergency" and related procedures must be recast for 2004 to exclude any BPA financial problems. The definition of "emergency" must be based on unforeseen circumstances. Any power sales revenues accruing to BPA and attributable to an emergency operation must be set aside for salmon mitigation, where such amounts will be in addition to and not in- lieu of previously planned BPA expenditure levels.

Energy and Water Conservation

- Water and land acquisition programs begun in 2001 should be continued.

- BPA should renew the 1995-2001 contract with Idaho Power Company to allow flexibility in flow augmentation for fish through power exchanges.

[4] Many power-marketing representatives from private or public corporations attend TMT meetings. These representatives are present to learn of real-time federal operators' river operation plans, in order to maximize power-marketing arrangements. As a result, federal operators are hesitant to disclose vital information and make decisions for fishery management to the tribes, state and federal fishery managers in this forum. TMT was not burdened with this situation in the early years of its implementation, but now it is a serious obstacle to regional information sharing, and has greatly diminished and compromised the effectiveness of TMT.

Runoff Forecast

- A comparison using the University of Washington's Climate Impact Group's (CIG) Experimental One-Year forecast (Hamlet and Lettenmaier 2003), using their VIC Hydro Model, matches well with CRITFC's regression analysis (Table 1).

- Water supply forecast correction curves (Martin 2002) suggest a medium-high water year. Runoff in the CRITFC 2004 Plan is projected to be 104 MaF for the Columbia at The Dalles.

Table 1. UW-Climate Impact Group forecast for the Columbia at The Dalles for WY 2004.

	Number of Water Years Used:	Number of Water Years Used:	
	11	3	Unregulated
Initial Conditions	UW-CIG	**CRITFC**	Flow
WY1994	(KaF)	(KaF)	(kcfs)
oct	5597	5501	89
nov	6252	6030	101
dec	5631	5755	93
jan	5347	5069	82
feb	5588	6391	110
mar	7194	6255	101
apr	10310	10214	170
may	20142	17010	274
jun	32271	32062	534
jul	25124	23011	371
TOTAL:	**106.0**	**100.0**	
(Jan. - July)	(MaF)	(MaF)	
Regression:	**110.1**	**103.7**	

Flow and Reservoir Management

- Available storage and runoff should be shaped to meet natural peaking, normative hydrographs at Priest Rapids, Lower Granite, The Dalles and other index points (Attachment 1). The object is to provide flushing flows during the main portions of the juvenile and adult migrations and to leave as much storage as possible for resident fish and tribal cultural resource protection.

- In general, reservoirs are left at the end of the salmon migration season at or above elevations specified by the NMFS 2000 FCRPS Biological Opinion.

- Dworshak. Refill of Dworshak Reservoir by the end of June is a high priority (Attachment 1). The majority of flow should be dedicated to summer migrants and

temperature control to attempt to meet Clean Water Act standards in the Lower Snake River. Consistent with the Nez Perce Tribe-State of Idaho Plan, Dworshak should fill to mean sea level (msl) 1600 feet by June 30 for juvenile and adult summer migrants and temperature control. A draft to msl 1590 feet by July 31 may be needed to alleviate temperature problems in the lower Snake. Dworshak should draft to msl 1520 feet by September 30. Neither CRITFC nor the Nez Perce Tribe supports any drafts down to 1500 feet and this compromises refill for the next water year and exposes tribal cultural resources to theft and vandalism.

- Lower Granite Reservoir should be drawn down to msl 723 feet during June 20 - October 31 to decrease juvenile and adult travel time and to make increase the effectiveness of temperature control from Dworshak.

- Hells Canyon Complex. The 110 KaF described in the 1998 FERC Biological Assessment for the Hells Canyon Complex should augment Snake River spring flows in May. For summer flows in June and July, Brownlee should contribute an additional 237 KaF described in the 1998 Biological Assessment and should pass through all upper Snake storage in June-August in addition to the 237 KaF from Brownlee. Idaho Power Company is requested to follow plan recommendations and should continue negotiations with BPA concerning establishment of a power and water exchange contract (Attachment 3). NMFS should release a biological opinion for the Hells Canyon Complex that includes Plan recommendations, with or without power/water exchange contract.

- Upper Snake storage. An additional 450 KaF should be added to the 427 KaF required in the NMFS 2000 FCRPS Biological Opinion for a total of 877 KaF flow augmentation from the upper Snake from Bureau of Reclamation and Corps of Engineers upper Snake reservoirs. This water should be passed through the Hells Canyon Complex in a timely manner to augment July flows, before the water heats up.

- Lake Roosevelt. Reservoir flood control drafts should be restricted to msl 1260 feet during April, which allows runoff refill for spring flows, Hanford Reach juvenile out-migration protection and summer flows (Attachment 1). Lake Roosevelt is drafted to msl 1289 feet by July 31, drafted to 1280 by August 31, and fills to msl 1283 feet by late September for resident fish and cultural resources.

- Banks Lake. Storage of 260 KaF (10 foot draft at Banks Lake) should remain in Lake Roosevelt instead of being pumped into Banks Lake to provide additional flow augmentation for salmon in August and September.

- Canadian storage. Storage should be released in early spring in order to leave some storage in Lake Roosevelt for salmon migrants and energy needs (Attachment 1). An extra 500 KaF from Canadian Non-Treaty storage over the 1 MaF called for by the NMFS Biological Opinions should be allocated for downstream flows.

- The CRITFC 2004 Plan recommends that modified VAR-Q operations be implemented at Libby and Hungry Horse without compensating drafts of Lake Roosevelt (Attachment

1). This action would hold storage in upper basin reservoirs for later anadromous fish migrations and reduce impacts to resident fish.

- Libby. Storage should be managed for sturgeon flows (an operation is offered for late June and early July), downstream salmon migrations and resident fish needs by implementing modified VAR-Q operations and fills within one-foot of full by late July (Attachment 1). Libby should be drafted to avoid drafting Dworshak, which has substantial temperature control capacity in the lower Snake.

- Hungry Horse. Storage should be managed for salmon flows and resident fish needs by implementing modified VAR-Q operations. CRITFC operations leave the reservoir 1.4 feet from full by June 30 (Attachment 1). Minimum flows of 2.5 kcfs maintained through September would benefit Columbia Falls flows.

- Power peaking/load following. Should be restricted to: 1) avoid stranding of juvenile salmon in the Hanford Reach, 2) allow fish ladders and other fish passage facilities to operate within established criteria and protocols and 3) to allow proper conduct of tribal treaty fisheries.

- Meeting Clean Water Act standards for dissolved gas and temperature is a high priority. Juvenile salmon should be left in river to take advantage of cool water releases and to avoid high temperatures in screen and transportation systems.

Hanford Reach Flows

- Power peaking should be restricted to avoid stranding of Hanford Reach juvenile chinook, especially during the key fry susceptibility period (March 15 - June 10). Fluctuations during this period should not exceed specified criterion during each 24-hour period in the CRITFC 2004 Hanford Stranding Operations Recommendations. (Attachment 2). To accomplish these fluctuation reductions, all seven Mid-Columbia Projects should stay on Mid-Columbia Hourly Coordination during all of the early migration and susceptibility period. Grant PUD should fund and should cooperate with tribal and fishery agency 2004 Reach monitoring and evaluation efforts.

Spill

- Spill has been demonstrated to be the most effective and safest means of juvenile project passage (Fishery Managers 1994; FPAC 2003; Whitney et al. 1998; NPPC 1999). Spill also best protects the beneficial use under the Clean Water Act by providing salmon access to lower temperatures found at depth in the reservoirs instead of higher temperatures found in dam bypass and transportation systems. Spill also provides safer downstream passage for steelhead kelts and adults that fallback over dams than powerhouse routes.

- The ROP spill planning dates are March 20-September 15 (Snake) and March 20-September 30 (Columbia). The extended spill period accommodates early spring juvenile migrants and kelts. Analysis by the Fish Passage Center indicates that federal 2004 Water Management Plan spring spill planning dates are April 10- June 20 (Snake) or June 30 (Columbia). End dates include August 31 (Snake) and September 15 (Columbia).

- CRITFC recommends provision for summer spill at Lower Granite, Little Goose, Lower Monumental and McNary dams above the requirements of the NMFS' 2000 FCRPS Biological Opinion.

- CRITFC recommends provision for daytime spill at John Day, McNary and the Lower Snake River dams. When implemented, daytime spill at most dams has been demonstrated to be as successful, or more so, than nighttime spill.

- The Corps of Engineers should complete their timely application for a total dissolved gas waiver to the appropriate water quality agencies to allow for both spring and summer spill at the eight federal dams and five Mid-Columbia dams.

Dam Facility Operations and Research

- Fish facilities should be operated according to CRITFC and other salmon managers' recommendations for the Corps of Engineers' 2004 Fish Passage Plan.[5] Inspection of facilities should be increased to a minimum of three inspections per day.

- Fish facilities should have full components of spare parts and backup systems, consistent with CRITFC and other fishery agencies recommendations to the Corps' 2004 Fish Passage Plan.

- Monitoring systems for water quality should be installed by the federal operators throughout the dams and reservoirs with real-time tracking of data.

- Mainstem research that involves fish handing and tagging and modifications to fish protection measures should be extremely limited, should not compromise fishery operations and should meet consensus tribal and fishery agency approval.

Fish Facility Mitigation Projects

- A list of mitigation projects has been compiled for dam fish passage facilities (Attachment 4). Funding of these projects would individually and collectively increase juvenile and adult passage success and survival.

[5] Formal CRITFC comments on the 2004 Corps' passage plan are in progress and will be submitted by March 16. CRITFC recommendations on the Corps' 2003 passage plan are attached to the ROP as a placeholder.

2004 FCRPS Flow Operations

The 2004 River Operations Plan recommends that the federal operators reshape available runoff and reservoir storage to create a natural peaking (i.e., normative) flow regime. The Plan specifically dedicates available runoff and storage to shaping the limited amount of water to best meet the migration and habitat requirements for anadromous fish.

That salmon flow is positively related to increases in survival and productivity has been established in various forums worldwide including a 1994 independent scientific review under the Northwest Power Planning Council, biological opinions and recent analyses by the fishery agencies and tribes (Agencies and Tribes 2003). In their 1995-1998 FCRPS Biological Opinion, NMFS provided minimum flow recommendations for listed salmon and established seasonal, flat, "target flow" regimes, which were considered the minimum flows necessary to prevent jeopardy to listed salmon populations. The NMFS' 2000 FCRPS Biological Opinion continues the concept of "target flows" for salmon, where specific seasonal average flows are to be met at Lower Granite, Priest Rapids and McNary Dam. During the creation of the target flow concept, it was realized by NMFS and the federal operators that the seasonal targets would not be met during the lowest series of water years, such as the case in 2003 and 2001, and in many higher runoff years.

The 2000 Biological Opinion differs from the 1995-1998 Biological Opinion in that the federal operators have more discretion to avoid implementing measures that will insure that flow targets are met. For example, the 1995-1998 Biological Opinion required the Corps to shift flood control storage further down the system and modify flood control rule curves to allow reservoirs to store more of the spring runoff for fish summer flows. In the 1995-1998 Biological Opinion, the Bureau of Reclamation was to provide an additional 1 million acre-feet (MaF) of water from the upper Snake for salmon flows. Again, this operation has yet to be realized.

The Plan's hydrograph has monthly flow objectives that would have flows peak well below flood stages in Portland and other locations [6] (Figures 1 and 2). Alternative flood control curves were modeled with GENESYS (Martin 2004) and the proposed URC values are listed in Table 2. Water Years 1961, 1962, and 1967 are used in the modeling because their volumes average out to near CRITFC's projected 104 MaF forecast for WY 2004.

In the Plan, the receding limb of the hydrograph that provides summer fish flows would be augmented by adding drafts of upper basin storage beyond what is required in the NMFS 2000 Biological Opinion. Drafts include an additional 500 KaF from Non-Treaty Storage from BC Hydro projects, an additional 450 KaF of upper Snake storage from Brownlee, and 237 KaF of Hells Canyon Complex storage. The resultant summer flows would create better migration conditions by reducing both salmon travel time and mainstem river temperatures.

[6] Flood stage is defined by the Corps as 550 kcfs measured at The Dalles Dam. Bank-full stage is defined by the Corps as 450 kcfs measured at The Dalles. The peak flow in CRITFC's 2004 River Operations Plan with altered flood control rule curves is about 386 kcfs at The Dalles, or 64 kcfs below bank-full. In the 2002 Biological Assessment for the Lower Columbia Channel Deepening, the Corps states that flood control was managed to keep peak flows at The Dalles at 550 kcfs in 1970 and prior years. In recent years, the Corps has managed to keep peak flows at The Dalles at about 360 kcfs, without Congressional authorization.

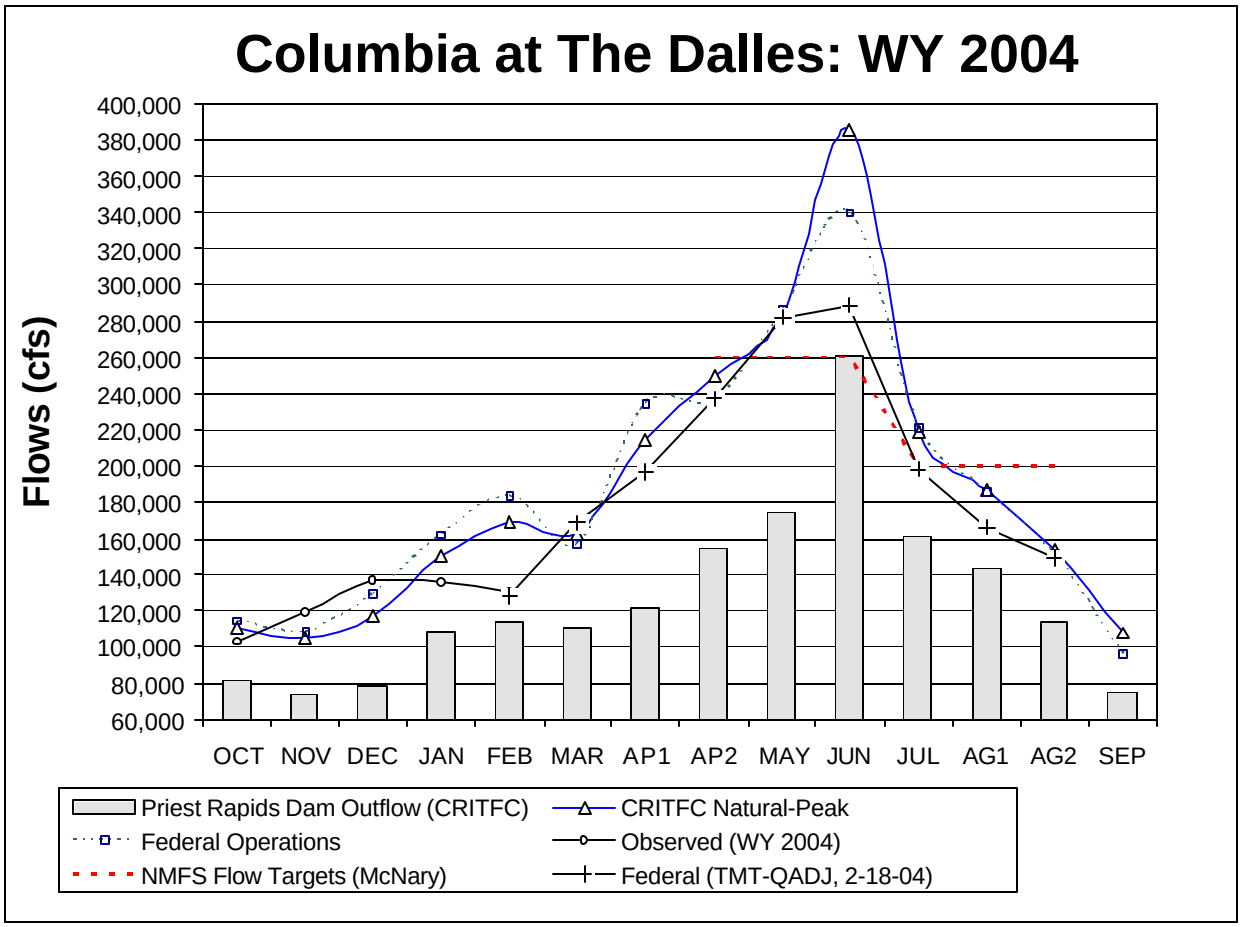

Figure 1. 2004 CRITFC River Operations Plan hydrograph for the Columbia at The Dalles and Columbia at Priest Rapids as compared to 2000 Biological Opinion flow targets, WY 2004 observed river flows, and likely WY 2004 river flows under federal operations (TMT-QADJ).

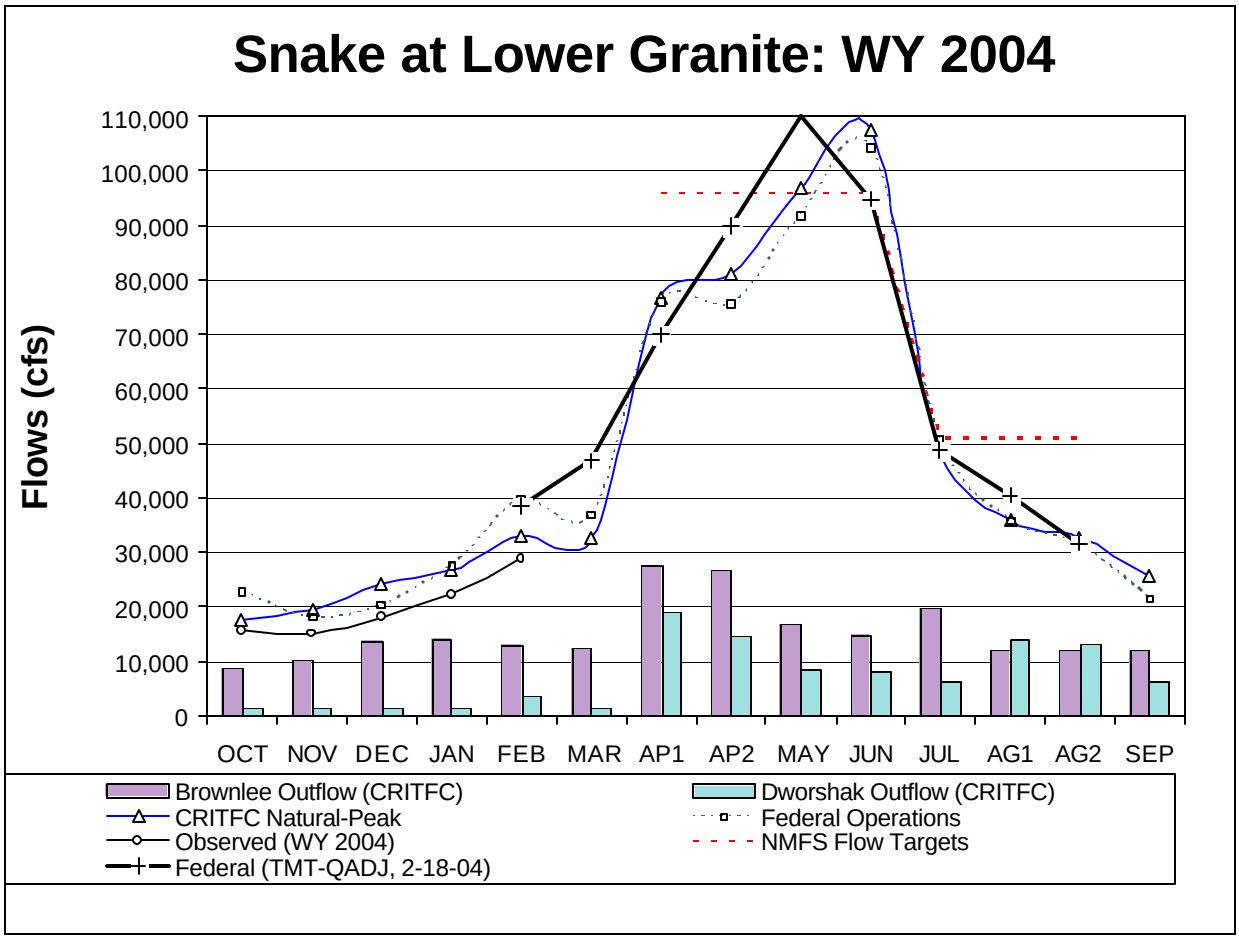

Figure 2. 2004 CRITFC River Operations Plan hydrograph for the Snake River at Lower Granite as compared to 2000 Biological Opinion flow targets, observed WY 2004 river flow, and likely 2004 river flows under federal operations (TMT-QADJ).

SYSTEM FLOOD CONTROL: UPPER RULE CURVE (URC), as modeled in GENESYS

WATER YEAR 2004 (average of WY 1961, 1962, and 1967)

GRAND TOTAL: KaF: **14863**

January 31st, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	10704.9	2457.3	10704.9	2457.3	0.0	
Arrow, BC	4885.8	1426.2	4687.4	1424.5	198.3	
Grand Coulee	5184.8	1290.0	5185.0	1290.0	-0.2	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	1286.4	1556.2	989.0	1535.2	297.4	**496**

February 28th, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	10120.8	2451.4	10120.8	2451.5	0.0	
Arrow, BC	3609.9	1415.1	3411.6	1413.3	198.3	
Grand Coulee	4988.9	1287.5	4988.9	1287.5	0.0	
Brownlee	898.8	2071.4	832.7	2066.7	66.1	
Dworshak	1175.9	1548.5	779.3	1519.5	396.6	**661**

March 31st, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	9472.9	2444.7	9472.9	2444.7	0.0	
Arrow, BC	3586.3	1414.9	1999.7	1400	1586.6	
Grand Coulee	5036.3	1288.1	3208.4	1263.6	1827.9	
Brownlee	975.2	2077.0	914.2	2072.5	61.0	
Dworshak	1629.2	1578.3	737.1	1516.2	892.1	**4368**

April 15th, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	9671.2	2446.7	9472.9	2444.7	198.3	
Arrow, BC	3322.4	1412.5	2132.4	1401.2	1190.0	
Grand Coulee	4648.8	1283.1	1930.4	1244.7	2718.5	
Brownlee	729.5	2058.0	580.8	2044.8	148.7	
Dworshak	1136.7	1545.8	513.9	1497.5	622.7	**4878**

April 30th, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	9671.2	2446.7	9472.9	2444.7	198.3	
Arrow, BC	2560.2	1405.4	2361.9	1403.4	198.3	
Grand Coulee	2995.7	1260.5	1210.7	1232.0	1784.9	
Brownlee	501.6	2037.3	501.6	2037.3	0.0	
Dworshak	1088.0	1542.4	592.9	1504.4	495.0	**2677**

May 31st, KaF:	***CRITFC***	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Mica, BC	10268.2	2452.8	10069.8	2450.8	198.3	
Arrow, BC	4018.1	1418.8	3621.4	1415.2	396.7	
Grand Coulee	3247.4	1264.1	2255.8	1249.3	991.6	
Brownlee	664.8	2052.7	664.8	2052.7	0.0	
Dworshak	1681.1	1581.4	1483.6	1569.3	197.5	**1784**

Table 2. Flood control Upper Rule Curves, as modeled in the NPPC GENESYS Hydro model.

2004 Spill Program for the Columbia Basin

The 2004 River Operations Plan recommends a program to increase spill at key projects in order to significantly increase overall passage success and survival for the 2004 juvenile and adult migrants. CRITFC does not support any reduction in Biological Opinion spill; in fact the ROP extends the spill season and adds additional spill at mainstem dams.

Principal features of this spill program include:

- Provision for summer spill at Snake River and McNary dams. The current NMFS 2000 FCRPS Biological Opinion does not require summer spill, despite the lack of scientific evidence that indicates transporting summer migrants would be advantageous compared to spilling migrants over dams. [7] CRITFC has advocated for a summer spill program and transport study (with summer spill) in the Lower Snake River for at least the last five years. This controversy was expressed in the fall fishery negotiations in *U.S. v. Oregon* in the last several years. CRITFC will continue to oppose any Snake River or McNary transport study that does include a reasonable spill and flow component.

- Provision for daytime spill at John Day, McNary and Lower Snake River dams. When implemented, daytime spill has been demonstrated to be as successful, or more so, than nighttime spill at most dams. Early migrations of abundant 2004 fall chinook migrants from the Hanford Reach will achieve better protection from daytime spill at McNary and John Day than under no spill conditions.

- Extension of spill season. The Plan also recommends that the spill season be extended in duration over that offered in the NMFS 2000 FCRPS Biological Opinion. Because mainstem river temperatures have been much warmer than in past years, it is very likely that juvenile migrations will start earlier than in the past and kelts will be migrating and need downstream protection. Early spill will better protect spring chinook kelts emigrating seaward. Recent radio-telemetry studies indicate that about half of steelhead spawners return to sea and that spill increases kelt survival (English et al. 2001; English et al. 2003; Evans et al. 2001; Evans 2002).[8] Spill should begin at mainstem dams around March 20, depending on the status of the migrations. Depending on monitoring assessments, spill should be extended to September 15 at lower Columbia Dams to assist millions of late migrating juvenile salmon and to reduce powerhouse injuries to adult steelhead and fall chinook that fall back at dams. Recent analysis by the Fish Passage Center indicates that a significant number of ESA- listed fish, including Clearwater fall Chinook and unlisted fish migrate through the hydrosystem in September.

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[7] Recent analysis *Review of the Bonneville Power Administration's analysis of the biological impacts of alternative summer spill operations* (Bouwes 2004) indicates

[8] Telemetry data from these studies indicate that in 2001 with no spill and screen system turbine passage, only 3.8% of radio-tagged kelts survived from Lower Granite Dam to the Bonneville Dam tailrace. These studies indicate that that if spill and sluiceway passage is provided, 86-93% of kelts will use these routes, which insure substantially higher survival rates through the dams.

- Real- time spill ramping impacting fish passage goals. During the 2002 spill season, spill levels were ramped up and down depending on the TDG readings from monitoring sites below dams. Atmospheric conditions, combined with temperature greatly influence the accuracy of TDG monitoring sites. Depending on exceedences of TDG levels that would violate gas waivers from the state water quality agencies, spill levels were reduced to levels well below the TDG waiver levels, and this condition was left for several hours. Thus, spill volumes required in the NMFS 2000 FCRPS Biological Opinion were not provided. It appears to CRITFC that Corps' actions to hold spill at levels below the gas waivers for hours after reducing spill is negatively impacting regional passage goals. For example, total dissolved gas levels at Bonneville's tailwater location are quite variable and these levels can impact spill operations at Bonneville, The Dalles and, to a lesser degree, John Day. It is our understanding that the Corps has set up a protocol to deal with ramping down spill when the monitoring sites are above the standard, however, a protocol for the real-time expedited ramping up of spill when the monitoring sites are under the gas waiver and the spill level is lower than intended in the NMFS 2000 FCRPS Biological Opinion has not been completed. The Corps should install the capacity to resolve this issue at all Corps dams by implementing project operational measures in the 2003 Fish Passage Plan and ensure that all dam operators closely follow the measures.

Priorities:

Refer to Table 3 for the details of project spill operations. All proposed operations conform to existing total dissolved gas constraints.

Bonneville (BON). Spill is very effective and efficient at Bonneville. Past survival studies indicate that for juvenile migrants, spill resulted in a relative survival to the estuary of 98% compared to screen bypass and turbine passage survival of 80% and 82% respectively. Recent installation of spillway deflectors decreased total dissolved gas levels to allow increased spill levels. CRITFC recommends daytime spill to the 120 kcfs until an additional fallback and potential delay of adults can be evaluated to determine if daytime spill to the cap is warranted. Fallback information for 2000 and 2002 showed little difference between fallback within 24 hours of exiting the adult ladder under low (75 kcfs) and gas cap spill. The 2002 balloon tag work showed higher survival and lower mortality under the higher spill rates at Bonneville (Normadeu, 2002 the final draft is still under review). Nighttime spill would set at ~150 kcfs or Gas Cap. At least three days of spill should be allocated at these levels to protect release of the Spring Creek Hatchery fall chinook migration during mid-March.

McNary (MCN). McNary is the only Lower Columbia dam that is not scheduled to have voluntary spill 24 hours a day in either spring or summer. The Plan's recommended hydrograph will create some involuntary spill at McNary as the powerhouse is hydraulically limited for flows up to about 140 kcfs. However, there is discussion of eliminating the 1% turbine operating range at this project which would further reduce any amount of involuntary spill. McNary passes a substantial number of Columbia Basin salmon from the Mid-Columbia, Snake River and Hanford Reach. The existing screened bypass system has structural and hydraulic problems; PIT-

Tag studies indicate that juveniles that experience multiple screen bypass passage have lower smolt-to-adult returns than juveniles that pass thorough spill and turbines (Bouwes et al. 2002; Budy et al. 2002). Of about 200,000 juvenile spring chinook marked and released in 1995 from the bypass system, no adults returned. Transportation results to date have been equivocal. Thus, to spread-the-risk [9] and encourage better tailrace egress conditions to avoid predators and delay, the Plan recommends that the Corps provide daytime spill at a level commensurate with the current nighttime Biological Opinion spill operation. Further, the Plan recommends that the Corps consider removing half of the turbine intake screens especially during the summer months when river temperatures often exceed the water quality standard.

The Dalles (TDA). Due to concerns with juvenile turbine passage (survivals in the low 80% range; 2000 FCRPS Opinion, Appendix D), it is prudent to increase non-turbine passage routes, which include the sluiceway and spillway. Spill is the only passage route that can immediately increase juvenile passage survival. The 1995-1998 FCRPS biological opinion required spill at 64% of daily average flow. Based upon questionable survival studies, NMFS decreased spill to 40% of daily average flow. In 2002 project survival decreased significantly. This subjects more juveniles to turbine passage. The CRITFC Plan recommends an increase in spill from the 2000 FCRPS Opinion level from 40% to 50% of daily average flow. North loading of the spillway with these flows would avoid placing juvenile salmon toward shallow island predation zones where they were placed with the 64% spill. The 2003 research and fish passage at TDA is best served by maintaining a constant spill level during the migration season.

John Day (JDA). Critical uncertainties remain regarding spill operations at John Day. Research in 2001 (Beeman, Counnihan et al. USGS, 2001) indicated that radio-tagged juveniles using the screened bypass outfall had a direct survival of 88-92%, while juveniles passing through spill survived in the 98-100% range. CRITFC proposes the best operation would be 30% of daily average flow during the day with 45 – 50% daily average flow at night. Night spill is very effective at passing fish. However the large volume of spill required to generate the high fish passage efficiency may in part, create poor conditions at the screened bypass outfall, which in 2002, may have led to lower survival. (Beeman and Counnihan 2002) Furthermore project operations of the turbine units were shown to be different than that outlined in the COE Fish Passage Plan (FPP). Hydraulic studies indicated a marked improvement in tailrace conditions at the outfall when turbine priority was followed as outlined in the FPP. Because indirect mortality rates and lowered smolt-to-adult survival rates occur for smolts that pass through screened bypass systems and bypass systems select against juvenile lamprey and certain salmons stocks, we recommend maximizing spill at John Day and examining fish passage without turbine intake screens through comparative survival studies as a high priority. In the future, to increase passage we recommend investigations of removable spillway weirs or similar surface spill options at JDA to increase fish passage efficiency. Current estimates for turbine passage in 2002 were extremely low with large confident intervals. Therefore, it is be prudent to reduce the exposure of juveniles to the powerhouse and potential turbine passage.

[9] Under the CRITFC Plan, "Spread the risk" entails an operation where approximately half of the migrants are passed through the dam via surface bypass and/or spill and the other half are passed through turbine screened systems and transported in trucks or barges.

Lower Monumental (LMN). With the repairs to the stilling basin complete, CRITFC strongly recommends the implementation of 24-hour spill for spring migrants and summer migrants. Transportation at Lower Monumental for spring migrants has shown to return fewer adults than Lower Granite, indicating that some serious problem in the screened bypass system or transportation system may be selecting against migrants. Summer migrant transportation has not been examined yet, but results from summer migrant transportation at McNary are not encouraging. We recommend spread the risk for migrants at this project and comparative survival studies that require removal of turbine intake screens. Furthermore, NMFS has suggested an operational change in the spill program at Lower Monumental. The 2000 FCRPS Biological Opinion indicated a 24-hour spill to gas cap operation. The proposed federal 2004 spill operation is one based on spill rates of approximately 50% of the instantaneous flow in order to reduce tailrace eddies. Whether or not this change would be beneficial for salmon has not been reviewed and CRITFC recommends a carefully structured evaluation before the spill change takes place. Survival and passage data from other projects, such as Priest Rapids indicate that salmon migration timing and survival has not been reduced from large eddy conditions in tailraces.

Little Goose (LGS). Currently, under the 2000 FCRPS Biological Opinion, the Corps does not provide daytime or summer spill. CRITFC strongly recommends the implementation of 24-hour spill for spring migrants and summer migrants. Smolt-to-adult survivals for juveniles that pass through screened bypass systems indicate fewer adults lower rates that for juveniles that pass through non-screened bypass routes. Spring transportation at Little Goose has been equivocal (Bouwes et al. 2002), thus, CRITFC recommends a spread the risk approach for juvenile migrants with about half passed in spill and the other half transported. Summer migrant transportation has not been examined yet, but results from summer migrant transportation at McNary are not encouraging. We recommend spread the risk for summer migrants at this project and comparative survival studies that require removal of turbine intake screens.

Lower Granite (LWG). For 2004, the Corps has left the removable spillway weir (RSW) installed in an attempt to increase fish passage effectiveness. CRITFC believes that the weir, with some auxiliary spill, should be tested in 2004 against spill at levels that approach total dissolved gas cap limits to determine if there is a difference in project fish passage efficiency (FPE). Auxiliary spill should be set at 22 kcfs to insure that juveniles are provided the best possible tailrace egress conditions, and that they are attracted to the RSW zone of influence in the forebay. RSW/spill tests should only compare two conditions to insure that there are adequate test blocks to insure results have statistical precision and robustness. It is vital to test the performance of the RSW at Lower Granite for summer migrants.

Ice Harbor (IHR). For 2004, CRITFC recommends a comprehensive study to evaluate passage as a whole at Ice Harbor. Several survival studies have been done at IHR in recent years with a large variety in survival estimates for both spring and summer. (Eppard et al. 2002 and 2003) It appears that high spill volumes in low tail water and low flow conditions do not provide optimal passage for juveniles. Whether this problem is due to mechanical/hydraulic conditions at the spillway, poor egress from the tailrace, which increases predation, or some combination of these factors is unclear. CRITFC recommends conducting a study that compared a nighttime spill

level less than the 100-kcfs/TDG cap to the existing spill level. Further refinement and study of the current spill patterns should also be examined to insure the best egress conditions possible.

Rock Island. This project still is under the authority of the Rock Island Settlement Agreement and established spill conservation account, despite incomplete Habitat Conservation Plan development. Chelan PUD should coordinate project spill with fishery managers through the Mid-Columbia Coordinating Committee. Spill should begin and end at the direction of the Committee, and should be provided at a minimum rate of 31 kcfs consistent with the 2000 spill program.

Rocky Reach. This project is still under the authority of the Mid-Columbia FERC proceedings, despite incomplete Habitat Conservation Plan Development. Chelan PUD should coordinate project spill with fishery managers at the direction of the Mid-Columbia Coordinating Committee. Spill should begin and end at the direction of the Committee, and should be provided at a minimum rate of 20% of daily average flows.

Wanapum. Spill should be provided as specified by the 2000 Spill Memorandum of Agreement (MOA) between Grant PUD and the Joint Fishery Parties, as modified by mutually agreeable research. The Agreement specifies that Grant will spill 43% of daily average flow in the spring and 49% of daily average flow in the summer to pass 95% of the juvenile migrants and meet an 80% FPE and 95% survival standard estimate. The beginning and end of spring spill is determined by the Mid-Columbia Coordinating Committee and the beginning of summer spill is June 15 or when fish are present, whichever occurs first and ends between August 15 and August 30 based upon in-season monitoring.

Priest Rapids. Spill should be provided as specified by the 2000 Spill Memorandum of Agreement (MOA) between Grant PUD and the Joint Fishery Parties as modified by mutual agreement for research. The Agreement specifies that Grant will spill 61% of daily average flow in the spring and 39% of daily average flow in the summer to pass 95% of the juvenile migrants and meet an 80% FPE and 95% survival standard estimate. The beginning and end of spring spill is determined by the Mid-Columbia Coordinating Committee and the beginning of summer spill is June 15 or when fish are present, whichever occurs first and ends between August 15 and August 30 based upon in-season monitoring. Spill at Priest should be increased by an equal amount of spill foregone at Wanapum if total dissolved gas restrictions limit Wanapum spill from achieving MOA required percentages.

Table 3. 2004 River Operations Plan Spill Program

Project	Biological Opinion Spill Spring	CRITFC Plan Spring	Biological Opinion Summer Spill	CRITFC Plan Summer
BON				
Day	75 kcfs	120 kcfs	75 kcfs	120 kcfs
Night	120-150 kcfs (Cap)	120-150 kcfs (Cap)	120-150 kcfs (Cap)	120-150 kcfs (Cap)
TDA				
Day	40% of flow	50% of flow	40% of flow	50% of flow
Night	40% of flow	50% of flow	40% of flow	50% of flow
JDA				
Day	0	30%	0	30%
Night	60% flow or max 180	45% vs. 60% (BiOp)	60% of flow	60% vs. 30%
MCN				
Day	0	50%	0	50%
Night	Gas Cap	Gas Cap	0	50%
IHR				
Day	45 kcfs	45 kcfs	0	45 kcfs
Night	100 kcfs	~50% flow vs. 100 kcfs	0	~50% flow vs. 100 kcfs
LMN				
Day	~50% of flow variable	40 kcfs (Gas Cap) vs. ~50% flow	0	30 kcfs vs ~50% flow
Night	~50% of flow variable	40 kcfs (Gas Cap) vs. ~50% flow	0	40 kcfs (Gas Cap)
LGS				
Day	0	45 kcfs (Gas Cap)	0	30 kcfs vs. ~50% flow
Night	45 kcfs (Gas Cap)	45 kcfs (Gas Cap)	0	45 kcfs (Gas Cap)
LWG				
Day	0	22 kcfs vs. 60 kcfs	0	22 kcfs vs. 60 kcfs
Night	60 kcfs (Gas Cap)	22 kcfs vs. 60 kcfs	0	22 kcfs vs. 60 kcfs

Attachments 1- 5

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Attachment 2

2004 Hanford Protection Operations to Reduce Juvenile Hanford Reach Fall Chinook Stranding and Mortality

Power peaking causing flow fluctuations from federal and FERC licensed dams in the mid-Columbia River can be extreme (Figure 3), with shoreline water levels varying up to 13 feet over a 24 hour period. When this occurs during the early emergence and migration of Hanford fall chinook from redds, hundreds of thousands of fry are stranded in pools or other entrapments left by the receding river. Fry are susceptible to avian or fish predation, thermal shock, stress and desiccation. Most of the significant stranding occurs with shoreline fluctuations of 1-3 feet Wagner et al. 2000). Fluctuations at flows of 120 kcfs and under are especially problematic because they dewater significant shoreline areas and cause greater risks of stranding (Table 4). Due to 2003 drought conditions, flows are likely to be in this range. Thus, CRITFC recommends no more that plus or minus 10 kcfs changes in mainstem flows in the Reach over a 24 hour period measured from noon to noon the prior day.

Biological and hydrological monitoring of the stranding has occurred since 1998 with funding provided by BPA and Grant PUD. The tribes and fishery agencies initially recommended that ever increasing or stable flows be provided in the Reach, consistent with the recommendations of the NPPC's Independent Scientific Advisory Board (Williams et al. 1998). In the CRITFC tribes' *Spirit of the Salmon* restoration plan, fluctuation of no more than 10 % of the previous day's average flow in the Reach was recommended. However, the federal and mid-Columbia FERC power operators claimed that this operation could not be accomplished because of power needs. Instead they offered regimes that targeted flow fluctuations to plus or minus 20-40 kcfs over the previous 24-hour flows. Tribes and fishery agencies were left with no recourse and could but monitor the dead and stranded salmon over the next three years.

In 1999-2001, the federal and mid-Columbia FERC power operators implemented an operational regime aimed at limiting flow fluctuations to reduce stranding. In 1999, the operators attempted to keep flow fluctuations within a plus or minus 20 kcfs range. In other words, the river flow levels from Priest Rapids dam could fluctuation up to 40 kcfs in a 24-hour period. The estimated fry "at risk" of mortality [10] from these levels for 17 miles of the Reach (about one third of the Reach) in 1999 was about 382,000 and about 255,000 in 2000. The confidence intervals around these estimates were wide because more sampling effort is needed. The overall annual fry production for the Reach has been estimated by WDFW as 16-27 million salmon.[11] The operators believed that these losses were acceptable as a cost of doing business for regional power production. To date, no mitigation or compensation for these losses has been offered by the operators.

[10] "At risk" are fry that have been stranded and are not likely to get passage back to the river in time to avoid predation, thermal shock or other mortality.

[11] The reader should note the difficulties and uncertainties in deriving these estimates in footnote four and text below.

In 2001, the operators wanted greater power peaking flexibility, thus, they proposed a flow fluctuation of 40-80 kcfs in a 24-hour period. Given the extreme low flow conditions, with the second worst runoff conditions in the 70-year record, CRITFC objected to this flow band and proposed no more than a 10 kcfs fluctuation in a 24 hour period. The fishery agencies and operators agreed to proceed with up to a 40-80 kcfs band. The result was more than a four-fold increase for "at risk" fry or an estimate of about 1.6 million fry.

Based upon 1) review of the four years susceptibility data, 2) additional information supplied by the USFWS on dewatered areas below Priest Rapids Dam and, 3) taking into account likely 2003 Hanford Reach flow regimes from 50-200 kcfs, we recommend the specific operations provided below. These are offered to reduce stranding impacts on Hanford Bright fall chinook, ESA-listed steelhead and Pacific Lamprey. In order to achieve the recommended flow bands, the federal operators should limit power peaking from Grand Coulee and release additional water on weekends to assure the FERC-licensed operators can keep the flows within the CRITFC recommended 10-20 kcfs maximum flow fluctuations. During the period of high fry stranding susceptibility, if necessary, the federal operators should rely on other generation sources than Grand Coulee to meet power contract obligations to reduce flow fluctuations. In turn, the Mid-Columbia FERC operators, in particular Grant PUD, will have to fill reservoirs on Fridays to assure that appropriate Reach flows would be maintained over weekends when reduced power demand and/or flood control operations limit upriver flows from federal dams.

Monitoring of stranding impacts and overall loss estimates for the middle section of the reach will be implemented by Grant PUD and WDFW using similar methods and effort as in 2002. For 2004, CRITFC, WDFW, and the Yakama Nation will expand sampling efforts to the entire Reach based upon a stratified sampling design that focuses on entrapments. The USGS plans on studying behavioral aspects of stranding in conjunction with these efforts.

The following are CRITFC's recommendations for 2004 operational constraints for flow releases below Priest Rapids Dam to reduce mortality of emerging and rearing juvenile fall chinook in the Hanford Reach. In 2002, a large escapement of adult chinook will create an estimated 39 million fry into the Reach. Due to much warmer temperatures that normal these fry have already begun to emerge from the redds. It is critical that the following criteria be implemented by the federal and Mid-Columbia PUD operators to protect this significant productivity.

2004 Hanford Juvenile Fall Chinook Flow Recommendations

Starting Program Operating Constraints

Seining of the six established index sites will be conducted three days per week (Monday, Wednesday, and Friday) beginning one week prior to the estimated start of emergence. Once a daily total of 50 sub-yearling fall chinook salmon fry are captured, a daily flow fluctuation constraint of 40 kcfs would be imposed. This constraint will continue until a daily total of 100 fry are captured from the index sites at which time the following proposed flow constraints will be implemented. After the 100 chinook criteria have been met, index sampling would be decreased to once weekly (Wednesday).

When PRD daily discharge is between 36 and 80 kcfs.

When average daily discharge at Priest Rapids is between 36 and 80 kcfs, the mid-Columbia projects will limit flow fluctuations to no more than 10 kcfs in a 24-hour period.

- Flow bands between 36 and 80 kcfs dewater the most area with the least amount of fluctuation and have the most potential for catastrophic fish kills.
- River configuration - long shelves, and shallow water entrapments, substrates that heat up or drain quickly.

When PRD daily discharge is between 80 and 110 kcfs.

When average daily discharge at Priest Rapids is between 80 and 110 kcfs, the mid-Columbia projects [12] will limit flow fluctuations to no more than 10 kcfs in a 24-hour period.

- Flow bands between 80 and 110 kcfs hold optimal rearing habitat. Data suggests these areas hold large entrapments and some stranding sites including backwater sloughs with good rearing habitat.
- These flow bands are located at the upper most reaches of the lower river shelves. Evaluation years 1999 and 2000, showed the highest susceptibility areas between 80 and 120 kcfs.

When PRD daily discharge is between 110 and 140 kcfs.

When daily average discharge is between 110 and 140 kcfs, the mid-Columbia projects[1] will limit fluctuations to no more than 20 kcfs in a 24-hour period.

- Data suggests that flow bands between 120 and 190 kcfs offer reduced susceptibility but not in the reach directly below Priest Rapids Dam.

[12] The mid-Columbia projects refer to Grand Coulee, Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum and Priest Rapids that are operated under mid-Columbia hourly coordination agreements.

- River configuration - steep banks, area of exposed shoreline drop significantly between 110 and 140 kcfs.

When PRD daily discharge is between 140-170 kcfs

When daily average discharge is between 140 and 170 kcfs, the mid-Columbia projects[1] will limit fluctuations to no more than 20 kcfs in a 24 hour period.

- Data suggests that flow bands between 120 and 190 kcfs offer reduced susceptibility in the SHOALS reach, but not in the reach just below Priest Rapids Dam.

When PRD daily discharge is 170 kcfs and above

When daily average discharge is 170 and above, the mid-Columbia projects[1] will limit fluctuations to no more than 20 kcfs in a 24-hour period. A minimum hourly flow of 150 kcfs will be maintained.

- Constraints will protect the backwater areas of the sloughs (Hanford Slough and White Bluffs Slough) from dewatering.

Ending Program Operating Constraints

CRITFC and WDFW recommend that flow constraints be terminated after the accumulation of 1400 temperature units (TU) past calculated end of spawning under the Vernita Bar Settlement Agreement.

- Evaluations from 1999, 2000, and 2001 show that susceptibility drops significantly after 1200 TU's and after 1400 TU it is assumed that susceptibility has reduced to allow for termination of constraints. The last fish found stranded and entrapped in 1999 and 2000 fell relatively close to 1400 TU's. The 2001 evaluation showed fish becoming entrapped and stranded past this deadline but at decreased rates.

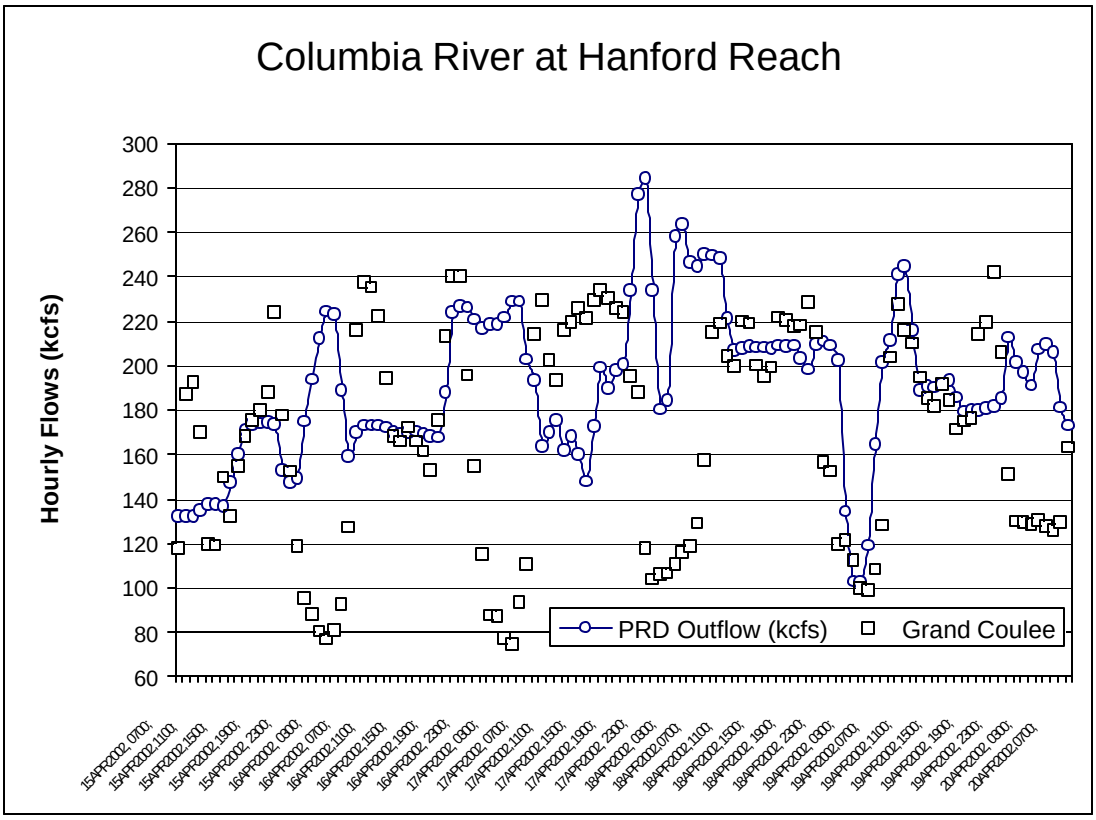

Figure 3. Hourly flows in the Hanford Reach during the 2002 out-migration.

Table 4. Flow bands and number of stranded and entrapped juvenile fall chinook salmon found on the Hanford Reach of the Columbia River in 2002 (From WDFW 2003).

Flow Band (kcfs)	Total Shoreline Within Study Area (hectares)	Number of Flow Fluctuations During Season	Shoreline Exposed During Season (hectares)	Number of Plots Sampled	Area Sampled (hectares)	Number of Plots with Chinook	Number of Chinook Found at Risk	Number of Chinook Found at Risk per Hectare
50-80	1,234.64	2.98	3,683.97	28	7.03	12	98	13.93
80-120	1,203.43	4.90	5,895.14	36	8.84	6	65	7.36
120-160	701.12	18.54	12,997.51	51	15.42	7	15	0.97
160-200	767.48	20.00	15,347.91	44	10.16	3	8	0.79
200-240	691.96	9.82	6,797.96	27	7.21	0	0	0.00
240-280	569.80	8.83	5,031.03	8	2.18	1	2	0.92
Total	5,168.43	65.07	336,320.91	194	50.84	29	188	3.70

Attachment 3

BPA-Idaho Power Company Water and Power Exchange

From the late 1980's until April 2001, BPA and Idaho Power Company (IPC) were engaged in annual exchange contracts for water and power. Typically, IPC would store water in the Hells Canyon Complex (Complex) in early spring and BPA would provide a power exchange to IPC. This storage would be released later in spring for salmon. The power generated from this release was sent back to BPA.

In the late summer, IPC would release storage and generate power, which would be sent to BPA. BPA would replace this power in September, which allowed IPC to store water to meet project elevations and assure that enough water was on hand for Hells Canyon fall chinook spawning.

In 1995, after release of the 1995-1998 FCRPS Biological Opinion, firm water exchange volumes and timing were established in contracts to meet Opinion RPAs. A five-year contract was finalized for power and water exchanges in 1996. In early May, IPC would release 110 KaF, and send power to BPA. BPA would send the power back to IPC the latter half of May and refill the Complex. In summer, IPC would 1) release 237 KaF from the Complex and 2) shape and pass 427 KaF of Bureau of Reclamation water through the Complex. The power generated from these releases was sent to Bonneville. Bonneville would send exchange power for the 237 KaF to IPC in September and send exchange power for the 427 KaF back to IPC the following winter.

Because power markets are more lucrative in summer months, BPA claimed that IPC gained a substantial financial advantage in the contract arrangement. BPA negotiated with NMFS to have the power exchange contract omitted from the 2000 Biological Opinion and the five-year contract expired on April 1, 2001. During 2001 and 2002 negotiations with the federal operators, the CRITFC tribes, Oregon and Idaho all pressed BPA to renew the exchange contracts with IPC. BPA claimed that they were at a financial disadvantage, thus, were unwilling to renew the contract, despite long negotiations with IPC that involved the Idaho Governor's office.

Without the contract in place, it appears difficult but not impossible for IPC to: 1) assure that the 427 KaF or additional upper Snake water will be shaped and passed through the Complex, 2) assure that the 110 KaF and 237 KaF will be provided in a timely manner for fish. This would assure that salmon obtain the water critical to their migrations, habitat and survival.

IPC recently released a draft license application for relicensing of the Complex, and is still engaged in ESA consultation for the Complex. In CRITFC comments on the draft license application, CRITFC analyses utilizing the GENESYS hydrologic model[13] indicate that, in

[13] The GENESYS model was developed by the Northwest Power Planning Council as a basinwide hydrologic model. It incorporates water routing thorough the Federal Columbia River Power System using a data set of 50 years of historical runoff (WY 1929-1978).

nearly all water years on record, a discrete 450 KaF [14] could be delivered downstream from Brownlee storage primarily in July for anadromous fish to meet the Opinion's Lower Granite target flows and the recommendations in the tribal recovery plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Nez Perce et al. 1995). These analyses show that in nearly all years, inflows into the Complex leave enough water to provide a minimum of 9.5 kcfs for fall chinook spawning flows in late September through early November, with spawning flows up to 13 kcfs possible in higher flow years. In addition, delivery of Complex water in July to the lower Snake would allow more judicious use of Dworshak Reservoir storage for temperature control. Idaho Power should conduct analyses that examine the potential for supplying 450 KaF, primarily in July, for flow augmentation in all water years while assuring that at least 9.5 kcfs is available for fall chinook spawning and rearing flows below the Complex.

Renewal of the BPA-IPC water exchange contract is important to facilitate vital flows downstream of the Complex for listed Snake River chinook and steelhead and endangered Snake River sockeye. Nonetheless, IPC has an obligation as a competent licensee to provide equitable treatment for salmon by providing the above storage volumes for flow augmentation.

[14] The 450 KaF should be contributed directly from Brownlee Reservoir. Bureau of Reclamation water from the upper Snake could be passed through in addition to the 450 KaF from Brownlee.

Attachment 4

2004 Fish Facility Mitigation Projects

1) Bonneville Dam. Automated Chain gates at Bonneville Powerhouse I sluiceway. This would allow for improved operation and better compliance with sluiceway criteria. The sluiceway has been shown to be a passage route for both juveniles and kelts; insuring that the sluiceway stays in criteria assures better access and utilization of this passage route.

2) Bonneville Powerhouse Two. Adult fishway trash rake system. Currently the rack and the rakes are not properly meshed, thus trash raking does not work well. The fishway units have to shut down to allow debris to float off. This problem has been ongoing for several years. In the past, during the adult passage season, debris build-up in the diffusers led to a failure of the system, and the ladder was forced to operate with only the emergency auxiliary water-supply system for nearly a month and fishway criteria was not met. Purchase of a proper rake system that meshes well with the rack will help to reduce the debris problem and should halt the operation of having to turn off the fish units at night to remove the debris. This on/off operation can lead to premature failure of the units and can possibly affect night passage of adults.

3) John Day Dam- North shore fishway pump The fishway pump is currently unable to provide entrance criteria for both north shore adult entrances due to a potential constriction in the hydraulic conduit. Funds could be used to determine a remedy for this situation.

4) John Day Dam- Full Flow PIT-Tag detection on the juvenile transport flume. Currently, adults that fallback over the dam can spend extended periods of time in the juvenile system since there is no way to move them from the channel. Several hundred adults are removed each time the system is dewatered. This dewatering is stressful to adults and has led to mortality. A full flow PIT-Tag detection system would allow for operation of the juvenile facility so that adults would not hold in the dewatering section of the transport flume. Further, juvenile stress would be reduced since the dewatering structure would not need to be operated.

5) McNary Dam juvenile screen system outfall. Concern has been raised about increased avian predation in conjunction with the outfall. Methods for reducing predation should be designed, implemented and evaluated for effectiveness.

6) Bonneville Dam. Bradford Island adult ladder repair and modernization. Currently the Bradford Island ladder is the oldest in the Columbia River Basin and renovation and repairs are underway. Increased funding would assure that the work would be expedited. This ladder system passes a significant portion of the entire Basin's returning adults, thus, expedient repairs are critical.

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October 7, 2003

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SUBJECT: **Comments on Draft 2004 FCRPS Water Management Plan for the Federal Columbia River Power System**

Dear Ms. Henriksen and Mr. Ruff:

On behalf of its member tribes, the Columbia River Inter-Tribal Fish Commission (CRITFC) appreciates the opportunity to comment on the draft 2004 Water Management Plan (DWMP) for the federal hydro system. We believe that significant information that is necessary to develop the plan has yet to be available or materialize. Thus, it is premature at this time to be considering many DWMP foundation issues. In the future, we recommend that the region expend precious fish recovery resources only once in developing the plan, when critical information is available in mid-January. This information includes but is not limited to:

- The first official water supply forecast is not released until January 1, 2004. Water supply is integral to the draft plan.
- Research results for many hydrosystem and fishery studies that will highly influence draft plan measures are not currently available.
- Other issues such as new transmission capability are still under development.

We have the following additional general comments on the DWMP.

First, the conduct of the Technical Management Team does not allow the free exchange of information between the fishery managers and the federal operators of the FCRPS. This is

because power marketing representatives are allow to observe and "listen in" on discussions regarding river operations that influence power marketing and sales, which may place federal operators to an economic disadvantage. This leads the federal operators to restrict fishery manager access to important river operation information, such as forecasted daily reservoir outflows and reservoir elevations to the fishery managers. Thus, CRITFC and other fishery managers cannot access critical information to plan operations to best benefit fish populations before and during the fish migration season.[15] To address this problem, we recommend that the federal operators convene a routine preseason and during season forum that excludes the marketing representatives, but allows the free exchange of hydrological and other information to the tribes and other fisheries managers. We suggest that the final water management plan (WMP) include a reference to this forum.

Second, we strongly recommend that the Corps' Annual Fish Passage Plan be appended to the final WMP. The FPP has specifics on spill operations, transportation, research and fish facility operations that are intricately tied to the WMP. Both of these documents are called for by the 2000 Biological Opinion; it does not make sense that they are kept in separate forums and never formally integrated.

Third, although the CRITFC tribes officially withdrew from the NMFS' Adaptive Management Forum in 1997,[16] the federal operators and federal fishery agencies still have a trust responsibility to formally consult with the CRITFC tribes before implementing actions, such as the water management plan, that will impact their trust and treaty resources. CRITFC can assist the federal agencies in arranging these consultations. The final WMP should contain a specific section indicating how the federal agencies intend to coordinate and consult with the tribes regarding all actions that will affect their treaty trust resources as required by the 1998 Secretarial Order for the Departments of Commerce and Interior, BPA's obligations to tribes, and the Corps' Nationwide Policy for Native American Tribes.

Fourth, the final WMP should include reference to and the details of the Detailed Operating Plan and annual PNCA planning hydro-regulations and non-power fishery constraints data submittals as the overarching plan to operate the FCRPS. The Corps and Reclamation's respective data submittals create the foundation for real-time decision making for river operations. Thus, while real-time river operations may be "tweaked" by the TMT, the actual plan to operate the river has already been established the February before the water year begins by the PNCA parties.

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[15] This information includes forecasted elevation at storage reservoirs and outflow information. Without this information, fishery managers cannot make well-informed decisions about flow management for fishery needs.

[16] In a letter dated May 16, 1997 from Ted Strong, CRITFC Executive Director to Will Stelle, NMFS Regional Director, CRITFC informed the federal government that it would, "… no longer participate in the NMFS adaptive management process, except as necessary to obtain information on system operations and configuration that cannot otherwise be obtained." In reaching this conclusion, CRITFC stated, "It is absolutely inappropriate for the policies of the United States, with respect to fulfillment of our treaties, to be determined by technical committees of biologists and engineers." CRITFC recommended that, "NMFS and the other federal agencies work with the Commission's member tribes to establish meaningful government-to-government relationship between the federal agencies and the tribes." And, "Consultations must be structured to reach agreement between NMFS and the tribes on policy issues before technical issues are referred to technical committees".

Fifth, there is not enough emphasis on water quality in the plan. Other than a section on dissolved gas, the plan is essentially silent on water quality actions to establish preferred temperatures and turbidity for the survival and productivity of anadromous fish. For example, water temperatures at the McNary juvenile bypass facility violate standards for an extended period of time every summer. There is no mention of point source pollution from the FCRPS (i.e., leaks from turbine and other equipment on dams).

Sixth, there is no mention of load following or power peaking operations in the plan. Such operations can cause desiccation of salmon redds, stranding of juvenile anadromous and resident fish and cause delay of juvenile and adult salmon. The final plan should acknowledge the impacts of power peaking on fish and offer management actions to reduce these impacts, such as limited peaking to some small percentage of the predicted base flow for the month. Such actions as experimental measures were offered by the ISAB in Report 2003-1, *Review of flow augmentation: Update and Clarification.*

Specific Comments

Section 1.1: Preparation of Plans

The DWMP does not refer to the tribes' *Spirit of the Salmon* (Nez Perce et al. 1995) anadromous fish restoration plan that has specific measures for river operations for all anadromous fish. As in the 2000 FCRPS Biological Opinion, the federal agencies should include reference to the tribes' plan, consistent with the federal agencies' obligations to consult and provide trust responsibility to the tribes.

Section 1.2: Strategy

This section lacks any reference to a basin-wide, ecosystem approach to increase productivity of listed and unlisted anadromous and resident fish (see Williams et al. 1996). Simply measuring reach survival of migrating juvenile fish as a performance standard is not adequate to restore productivity. For example, delayed mortality from hydrosystem passage does not occur until after the fish leave the last dam and enter saltwater (Budy et al. 2002). Further, there is no mention of increasing adult survival through the hydrosystem and increasing spawning success, two metrics essential to increasing anadromous fish productivity (Lichatowich and Cramer 1979). This section should be expanded beyond mere reach survival-performance standards.

Section 1.2.1.Hydro Strategies and Substrategies

Actions to meet water quality standards are needed for this section. Among other things, actions should include selected water releases from Dworshak Reservoir, investigation of selected water releases from Lake Roosevelt, keeping fish out of dam bypass and transportation systems under elevated temperature conditions that exceed standards, avoiding trapping adult fish under elevated temperature conditions that exceed standards, and monitoring of disease at dams under elevated temperature conditions. A high CRITFC priority is establishment of a

peaking (i.e., normative) hydrograph that provides for the environmental and passage conditions that support anadromous fish productivity to recovery goals (Williams et al. 1996). This is not mentioned in the DWMP.

Section 1.3: Non-Biological Opinion Actions

Tribal fishing should be listed for the John Day and The Dalles pools—not just Bonneville, and provision for a summer fishing season in July should be included. We recommend that the final WMP be restricted to fish and wildlife related actions, flood control and navigation actions. Recreational actions are lower priority and should not conflict with the other actions.

Section 2.1: Hydro-System Priorities

The action agencies must consult with NMFS and USFWS and the tribes before establishing priorities in the plan. We recommend that:

- The April 10 refill operation of reservoirs to their upper rule curve should be priority one.
- Refill of reservoirs to the June 30 should be priority two.
- Operation of storage reservoirs to meet criteria for bull trout and sturgeon as priority three.

Meeting these priorities should take precedence over meeting power generation needs. If flood control is operated with flexibility and a reasonable minimum spawning flow for chum is established and maintained through reduction of lower river power peaking, it is not necessary to consider reducing Hanford Reach flows established to protect thousands of fall chinook redds. The 2000 FCRPS Biological Opinion, through adoption of the 1995 FCFPS Biological Opinion, established scientific evidence why the flow targets must be met as the minimum to avoid jeopardy to listed stocks. Meeting flow targets must be given a higher priority than meeting minimum elevations in reservoirs at the end of August and not the other way around as stated by the DWMP.

Adaptive management is not, as described in the DWMP, "…. The concept that the operation of the system should be adjusted based on acquired knowledge about current conditions in the system…" but is instead involves management actions that will increase the ability to discriminate between alternative states of nature (Hilborn 1987). This requires that exploratory, probing actions be employed that provide information about the true state of nature. An example of this probing could be that no fish are transported in an average flow year. The final WMP should reflect this difference in the use of the terminology. We concur with the ISAB (2003) that, "… decisions to implement actions that have any potential for adversely affecting an ESU will be required to satisfy a burden of proof that no harm is likely to be done as a result of the action."

We disagree with the statement that, "…[t]he use of water for any one fish species or project purpose will most likely affect the amount of water available for other fish species or project purposes." This is not correct. For example, storage added to natural runoff will provide good migration conditions for a particular year class for all anadromous fish stocks that are present. On the other hand, filling of reservoirs for recreational purposes, such as boat races, will increase water particle travel time through those reservoirs and delay fish migrations. The final WMP should correct this broad, incorrect statement.

Because chum spawning requirements affect storage and refill for all anadromous fish the following year, a precautionary approach should be used when setting chum flows in November and December. Preseason forecasts, groundwater storage and the previous year's runoff and meteorological conditions should be carefully considered when setting minimum chum flow spawning regimes. For example, the University of Washington Climate Impacts Group has projected a 110 MAF January- July runoff at The Dalles for 2004, while CRITFC has independently projected a 104 MAF runoff for the same period. Use of this information and the status of deficient groundwater supplies from the below normal runoff in 2003 supports limiting minimum chum spawning flows below Bonneville Dam to 120 kcfs. Power peaking from load following tends to complicate chum spawning and the maintenance of flows to protect chum redds. CRITFC strongly encourages the Corps and the other federal operators to consider reducing load following at Bonneville Dam to reduce these impacts.

The 2000 FCRPS Biological Opinion requires flow and spill measures to increase the survival of listed anadromous fish in order to avoid jeopardy and to meet tribal trust obligations, since these fish must pass many dams and reservoirs. The action agencies must consult, not coordinate, with NMFS, USFWS and the tribes on all aspects of river operations that affect this very high priority. The final WMP should reflect these responsibilities.

Section 2.2: Conflicts

In order to meet the 2000 Biological Opinion river operations requirements and other requirements, flood control rule curves should be modified. There is additional flood control space located in Canadian reservoirs that is available for purchase that could be utilized as part of this modification.[17] The DWMP fails to include relaxing flood control management in Libby, Dworshak, Brownlee and other storage reservoirs in the upper Snake River. Further, several state-of-the-art advanced weather and climate diagnostic tools are available to be used to modify flood control, especially when conducting long-range water planning. [18] These include: probabilistic streamflow and climate forecasts, multivariate ENSO (El Nino Southern Oscillation) index, ENSO Risk Model, and sea-surface temperature departure analysis. As mention above, the University of Washington Climate Impacts Group now produces a one-year lead ensemble forecast for the Columbia at The Dalles that should be considered. A

[17] This space of 500 kaf, is noted in the 1995 FCRPS Biological Opinion.
[18] RPA Number 35 in the 2000 FCRPS Biological Opinion specifies use of these new technologies that, "….[w]ould enhance system response and afford greater precision in system flood control operations". To our knowledge, the federal operators are not using available technologies that could make available more fish flows.

comprehensive package of the above climate forecast tools is needed to better manage all Columbia Basin reservoirs. These methods are recommended in the 2000 FCRPS Biological Opinion and should be included in the final plan.

Section 2.2.2: Spring Flows vs. Project Refill

CRITFC continues to advocate for a natural peaking flow or normative hydrograph concept. For the past several years we have offered the federal operating agencies a detailed water management plan that meets the dual objectives of a peaking hydrograph and meeting reservoir refill levels. We have yet to receive any written comments on these plans. Again, we ask the federal operators to review our River Operations plans and consider using them as a paradigm to meet spring and summer flows and reservoir elevations.

Section 2.2.3: Chum Tailwater Elevations vs. Spring Flows

We responded to this issue in our above comments.

Section 2.2.4: Sturgeon Pulse vs. Summer Flows

We are unsure as to how the sturgeon operation comports with VAR-Q at Libby that is likely to occur in WY 2004. The final WMP should carefully explain this issue.

Section 2.2.5: Fish Operations vs. Other Project Uses

If non-power constraints are identified in detail and specified in the 2004 PNCA planning, there should only be minimal in-season conflicts between fish and power operations. Spill levels and flows should be clearly specified from the PNCA non-power constraint in the 2004 final WMP. Irrigation demands and recreational elevations can and should be modeled prior to the water management season to determine if conflicts will exist. In any case, they should have a lower priority than meeting fish flows under the Endangered Species Act. If preseason runoff forecasting tools are utilized and an increased level of precision and detail is applied to planning to avoid conflicts before the fish passage season begins, in-season conflicts should be minimal and all parties involved with water management actions will know beforehand what to expect.

Section 2.2.6: Conflicts and Priorities

As mentioned above, CRITFC's member tribes withdrew from the NMFS' Adapative Management Forum several years ago. The regional federal executives have a trust responsibility to meet with our member tribes' government officials before and during the fish passage season with respect to FCRPS operations.

Section 2.3: Emergencies

Short-term FCRPS emergencies that impact fish flows, spill and dam operations over a few hours or days should be avoided. If they do occur, tribal technical and policy representatives should be immediately notified and consulted and appropriate in-kind mitigation should be implemented as soon as possible. In no case should fish operations be interrupted due to financial reasons such as poor financial planning.

Section 4.1.1: Reservoir Passage

The Corps operated Lower Snake reservoirs to MOP+1.5 in 2003, contrary to the Biological Opinion. CRITFC expects that Lower Snake reservoirs will be operated within one foot of MOP in 2004.

Section 5.1: Flow Objectives

The 1995 FCRPS Biological Opinion stated that the minimum flows were set as bare thresholds to avoid jeopardizing the listed salmon ESUs. If the minimum flows are not met, then the listed species are placed in jeopardy. Thus, every effort must be made to meet the minimum flows through modification of flood control, and purchase of flood control space and purchase of power produced off of the river. This includes meeting the minimum flows during weekends. To migrating salmon that need flows for critical life history functions, a weekend is the same as a weekday. The FCRPS must be adjusted to meet the needs of salmon, instead of salmon trying to exist in the face of federal operators running the FCRPS to achieve financial gains. Further, substantial numbers of juvenile salmon migrate in September (FPC 2003 unpublished data) and the majority of adult salmon and steelhead migrate in September, so serious consideration should be given to extending salmon flows and spill through September.

As noted elsewhere in these comments, in CRITFC' *River Operations Plan*, we have developed a normative peaking hydrograph that in general meets seasonal target flow objectives and reservoir refill objectives. The normative peaking hydrograph also provides the physical habitat parameters, such as sediment transport, nutrient cycling, enhancement of mainstem and estuarine riparian corridors and water quality elements critical to salmon life histories (Williams et al. 1996). Using this paradigm, with trended-and-corrected Water Supply Forecasts during the fish passage season, the Federal Operators can deliver more water in a timely manner to better coincide with the salmon's life cycle and better protect listed and unlisted salmon and other anadromous fish. We recommend that these paradigms be tested for the FCRPS in WY 2004.

Section 5.2 All Storage Projects

Available research indicates a direct flow-survival relationship for juvenile steelhead, that are spring migrants (NMFS 1998). For example, Mullan et al. (1992 in NMFS 1998) regressed smolt-to-adult returns of Wells hatchery steelhead against spring flows which indicated that flows over 140 kcfs resulted in smolt-to-adult returns that were three times higher than for lower flows. Berggren and Filardo (1993) also showed a strong relationship with steelhead migrations and increased flows. Under low flows in 2001, only 4% of Snake River steelhead were estimated to survive, the survival rate in 2002, a near normal runoff year, was about 26%. All

efforts, described above, must be made to achieve spring flows and reservoir refill. All of these elements should be included in the final WMP.

Brownlee and upper Snake reservoirs are not listed in this section. In the final WMP, these storage reservoirs should be listed and operations for fish should be specified. Included in these specifications should be the steps that Reclamation is taking to guarantee that the 427 Kaf of upper Snake flow augmentation will be delivered in a timely manner for 2004 fish migrations.

Section 5.8.3: Dworshak Summer Operations

Water from the upper Snake reservoirs and the Hells Canyon Complex should augment natural flows. BPA should enter into a water-power swap with Idaho Power to provide timely summer flow augmentation from the Complex. Dworshak should be prioritized for temperature control, not flow augmentation. Summer drafts should be limited to 1535 feet by August 31 unless additional water is needed for temperature control. Dworshak should be targeted for refill to msl 1600 by June 1 or earlier and be targeted for msl 1520 feet by mid-to-late September. A monitoring program should be put in place to evaluate effectiveness of Dworshak operations. The Corps should provide the Nez Perce Tribe with financial resources to protect cultural sites and resources during reservoir draw downs. All of these elements should be included in the final WMP.

Section 6.0 Hydrosystem Substrategy 2.3: Spill operations for project passage

The final WMP should describe the 120% total gas pressure as conservative, because, among other things, salmon can and do achieve depth compensation in the river from elevated levels of dissolved gas. This comports with the relevant regional research (Backman et al. 2002 and Backman and Evans 2002), a risk assessment by the regions' fishery managers (Columbia Basin Agencies and Tribes 1995) and the water quality appendix to the 2000 FCRPS Biological Opinion. All of these indicate that total dissolved gas levels cause little harm up to 125% TGP. Thus, spill management should not be overly concerned about some excursions above 120% TGP.

Recent data obtained from turbine survival and transportation studies at McNary Dam indicate that turbine mortality of summer migrants is very high and that transportation, with respect to smolt-to-adult returns is at best the same as in-river passage may be worse. Serious consideration to implementing a spread-the-risk passage action [19] at McNary for summer migrants should be included in the final WMP.

Recent data for spill at Bonneville Dam indicates that adult fallback is not substantially affected by daytime spill. The final WMP should incorporate a 24-hour spill program at Bonneville without a daytime spill cap.

[19] This action would entail summer spill at McNary as necessary to pass 50% of summer migrants over the spillways.

Bonneville spill for Spring Creek National Hatchery fall chinook is not mentioned in this section. The final WMP should include a 3-7 day spill program in March to protect this stock of international importance.

Section 7.1.3: Libby Storage Reservation Diagram

The December 31 preemptive draft at Libby to msl 2411 feet should not be implemented in this year to leave additional water in storage for WY 2004. The final WMP should contain all work that the Corps has accomplished to modify the December 31 flood control draft point.

Section 7.9: Dworshak Draft to 1500 feet

CRITFC does not support any draft below msl 1520 feet. Drafts below this level may reduce refill probabilities the following year and cultural resources are particularly exposed at drawn down elevations and are vulnerable to vandalism and theft.

Section 7.10: Other Reclamation Water Management Actions

The final WMP should incorporate, in detail, what specific actions will be taken in 2004 to reduce illegal water spreading. The Columbia Basin Institute, in its 1994 report on the Columbia Basin Irrigation Project, identified 800 to 1000 Kaf, out of the 2.8 Maf being diverted by the Bureau of Reclamation, that is illegally being misused by some irrigation districts. The upper Snake contribution from Reclamation reservoirs should be specified in the final WMP as a minimum of 427 Kaf.

Section 12.4.1: Kokanee—Grand Coulee

The upper Columbia Tribes have indicated to us that Lake Roosevelt needs to be at msl 1283 by the end of September to allow kokanee spawning access to tributaries. Filling to elevation 1285 feet by October 1 is not necessary for kokanee spawning and such refill could reduce lower river mainstem flows in September that would negatively impact CRITFC' member tribes treaty fisheries.

12.5 Hanford Reach Protection Flows

Flow fluctuations from Grand Coulee and Chief Joseph projects can overwhelm efforts of the mid-Columbia public utility districts to reregulate and stablize flows into the Hanford Reach. Stable flows in the Reach are vital to protect millions of emerging and migrating fall chinook from stranding and entrapment. The federal operators should work with the fishery managers to limit flow fluctuations during the susceptibility period from late March until early June. These issues should be specifically detailed in the final WMP.

Section 12.9.1: Tribal Fishing

CRITFC's member tribes' treaty fisheries occur in all of Zone 6 (Bonneville to McNary dams). Pool elevation restrictions and steady flows should be provided during tribal fisheries for

all of Zone 6, not just Bonneville Pool. The federal operators have a trust and treaty responsibility to provide this operation. The final WMP should specify these requirements.

Conclusion

CRITFC appreciates the opportunity to review and comment on the 2004 DWMP. We anticipate that the federal agencies will consider and adopt our recommendations for the final WMP. Should you have questions about these comments, please contact Kyle Martin or myself at (503) 238-0667.

Sincerely,

/s/
Robert Heinith
Hydro Program Coordinator

CC: Commissioners, Tribal staffs, tribal attorneys, CBFWA Fish Managers, Regional Executives

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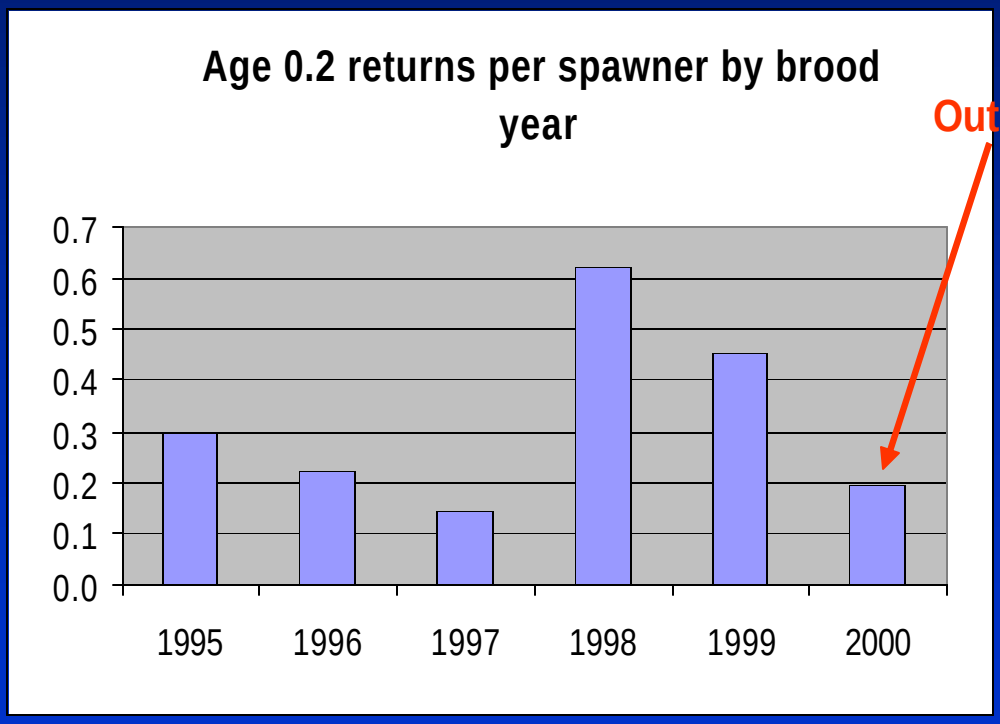
Attachment B

Fall Chinook Returns per spawner



Attachment C

FISH PASSAGE CENTER

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Phone: (503) 230-4099 Fax: (503) 230-7559
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MEMORANDUM

TO: Rob Lothrop, CRITFC
Bill Tweit, WDFW

FROM: Michele DeHart

DATE: April 6, 2004

RE: Transportation of fall chinook smolts and related fall chinook migration and tag data concerning summer spill for fish passage

In response to your request for smolt to adult return rates on transported fall chinook the Fish Passage Center staff reviewed and analyzed the available PIT tag data. We calculated smolt-to-adult returns for transported and non-transported fall chinook from the Snake and Columbia rivers. This analysis of transported versus in-river migrating smolt-to-adult returns is preliminary; NOAA Fisheries staff will conduct the official analysis.

Our review resulted in several observations about fall chinook migrations, in addition to the smolt-to-adult returns, that relate directly to the present discussions regarding summer spill for fish passage. Thus far all of the discussions surrounding summer spill have centered on the BPA SIMPAS model analysis of average conditions with point estimates of juvenile passage data. The data we reviewed, such as actual adult return PIT tag data was not recognized or considered.

We have summarized our conclusions below, followed by a detailed discussion of each point. These data suggest that the benefits of summer spill for fish passage have been underestimated in deliberations thus far and that a decision to eliminate summer spill carries a significant risk of being in error, particularly in regard to impact on returning adults and assumptions regarding the benefits of the transportation. In accord with our normal FPC procedures, copies of this memorandum responding to your data request have been circulated to other CBFWA members and posted on the FPC web site.

- Smolt-to-adult return rates for transported fall chinook indicate that a spread the risk policy such as that implemented for spring chinook should be considered for fall chinook. The adult return data indicates that the best returns occurred when spill occurred at McNary throughout the summer period. The fall chinook SARs on transported fish are disappointing and may not achieve the recovery goals

assumed in the 2000 BIOP. This will affect the analysis of impacts of the summer spill program modifications because a spread the risk policy will result in a larger proportion of Snake River fall chinook migrating in-river. The SIMPAS analysis conducted to date did not examine the impacts of discontinuing summer spill with the implementation of a spread the risk policy for transportation.

- PIT tagged adult fall chinook actual returns from 1994 through 2001, that were detected as juveniles, indicate that a large proportion of the fall chinook that survived to return as adults migrated, as juveniles, past Ice Harbor in late July and August and past McNary in August. This indicates that the SIMPAS predictions of impact on adult returns should be regarded with caution because the juvenile passage distribution assumed in BPA's analysis does not reflect actual adult return data and does not provide a robust basis for decisions. Spill may be much more important to adult returns than inferred from juvenile modeling data.
- Review of the data and research results indicates that there is a flow survival and flow travel time relationship for fall chinook. Analysis of alternative management scenarios and mitigation offsets have not considered or utilized this information. Low flow conditions will shift the passage distribution to later in the migration. SIMPAS analysis of average conditions does not capture this effect because it does not vary flow nor does it relate flow to passage distribution. Elimination of spill in August as discussed by BPA will affect a larger proportion of the migration in low flow years than estimated with their model.
- Our review of the data shows that a comprehensive system wide life cycle monitoring program is needed for fall chinook. We have developed an outline of a PIT tagging monitoring program that would assist the agencies and tribes in deliberations of mitigation and protection hydrosystem actions needed for fall chinook.

Fall chinook smolt-to-adult returns

Smolt-to-Adult return rates (SARs) of subyearling fall chinook for comparing in-river versus transportation migration routes based on available regional PIT tag data.

The PIT tag data available for subyearling fall chinook originating in the Snake River basin above Lower Granite Dam consists of wild fall chinook PIT tagged in the mainstem Snake and Clearwater river above Lewiston and hatchery fall chinook PIT tagged for the supplementation releases made at and near the Pittsburg Landing, Captain Johns Rapids, and Big Canyon Creek acclimation ponds over the years 1995 to 2001. Typically, over 95% of the PIT tagged subyearling fall chinook are hatchery fish. Because the goals of these PIT tag studies required keeping the fish in-river, there were low numbers of PIT tagged subyearling chinook routed to transportation until 2001 when NMFS began a multi-year transport evaluation.

Until the NMFS transportation study, most PIT tagged subyearling fall chinook in the Snake River basin have been purposely returned-to-river for in-river survival estimation. Only PIT tagged fish arriving the transportation sites during the standard timed subsamples were being transported. Consequently, prior to 2001 the sample size for this group was very small. Therefore, for this analysis all PIT tagged smolt detected in the raceways or sample rooms, regardless of prior detection at an upstream dam, were combined to create the transportation category. Fish first-time detected at Little Goose Dam and either transported at Little Goose or

returned to river and then transported at Lower Monumental Dam were converted to Lower Granite Dam equivalents by dividing by the CJS survival estimate (derived from the Cormack Jolly Seber Model) between Lower Granite tailrace and Little Goose tailrace. Likewise for first-time detected fish at Lower Monumental Dam, the smolt numbers transported were expressed in Lower Granite Dam equivalents. The sum of all PIT tagged smolts from the four transportation sites expressed in Lower Granite Dam equivalents determined the initial juvenile sample size used in the development of smolt to adult return rates.

The in-river PIT tagged subyearling fall chinook with first-time detections at Lower Granite, Little Goose, Lower Monumental, or McNary dams were each divided by the reach survival component to create the total smolts in Lower Granite Dam equivalents. Because the number of PIT tagged smolts with a detection at a transportation site is a known count, and the number of PIT tagged smolts transported or returned-to-river at each sites is a known count, the only estimation required is the expansion to Lower Granite equivalent and this is done similarly for both in-river and transported fish. This make the comparison of the transported category termed T in Figure 1 and the in-river category termed C1 in Figure 1 the most direct comparison between the two modes of migration through the hydro system. With the exception of one year (1998) the SARs for the in-river fish exceeded the survival of transported fish. While this trend was consistent among years, the low sample sizes for transported fish prior to 2001 must be considered. The most conservative conclusion from the present data is that there appears little difference between PIT tagged subyearling chinook transported or bypassed at collector dams.

The in-river PIT tagged subyearling fall chinook that most closely relates to the untagged population is termed C0 in Table 1. This group must be estimated by first determining the population at Lower Granite Dam and then subtracting off all first-time detected fish at Lower Granite, Little Goose, Lower Monumental, and McNary dams, with numbers from each site divided by the appropriate survival component to create a result in Lower Granite Dam equivalents. The highest SAR for the C0 category occurred for migration year 1999 which had no PIT tagged fish overwintering until the following year. The very high flows of 1999 that extended into the mid-July of that year, and associated spill, may have allowed many subyearling chinook to pass undetected that year under good in-river conditions. The SAR of C0 category subyearling fall chinook appears to be higher than the SAR of either transported or bypassed subyearling migrants for the seven years of samples. A caveat to the above conclusion is a methodological issue with the C0 inriver group, which may require additional resolution. We found a possible discrepancy between CJS estimates of collection efficiency, and FGEs reported in the 2000 FCRPS BiOp, which may affect numbers of smolts in the C0 group. The bypass FGE in Table D-2 of the 2000 FCRPS BiOp is 53% at Lower Granite Dam. With any spill at Lower Granite Dam during the last month of the spring spill program, ending June 20, the effective collection efficiency for subyearling chinook for the season would tend to be somewhat lower than the 53% FGE level. However, the CJS model for the aggregate subyearling chinook was greater than 53% in 4 of the 7 years investigated (0.66 in 1995; 0.63 in 1996; 0.41 in 1997; 0.47 in 1998; 0.43 in 1999; 0.56 in 2000; and 0.68 in 2001). This may lead to a bias in C0 estimated numbers of smolts being too low, and therefore, the SARs being too high. However, even if one were to double the C0 smolt, the SAR of C0 category subyearling fall chinook would still appear to be higher than the SARs of the other two categories in each year.

PIT tag detections systems in the Snake River end operation on October 31, and begin again the next spring. Consequently, fish passing during this period are not detected. However, for fall chinook smolts that overwintered and were detected only during the following year at one

or more dams as a yearling, the SARs were over 1% in all cases where large enough smolt numbers were present to provide some adult returns (Table 2). Although these SARs are higher than that of their subyearling chinook counterpart, it is difficult to make a direct comparison because the number of smolts overwintering cannot be expanded to Lower Granite equivalents due to the lack of an overwintering estimate of survival. It appears that even after consideration of these holdover migrants little difference may still exist between transport and in-river survival during the following year since the raw SARs shown in Table 2 are fairly similar between categories.

NMFS began a transportation study at McNary Dam in 2001, but also had large numbers of PIT tagged subyearling fall chinook released in 1999 and 2000 for facility survival studies (Table 3). These latter PIT tagged fish were released in the gatewell for the test group and in the tailrace for the control group. Since most gatewell fish were return-to-river, there were only limited numbers of smolts transported. The SARs of the transported smolts were less than that of the in-river migrants, but these results may simply imply that no real difference occurs between the two categories. The partial returns of the full transportation study began in 2001, show that the SARs of the transported and in-river smolts, based on returning jacks and 2-salt adults, are the same. However, 3 and 4-year ocean fish from the 2001 outmigration are yet to return so complete SARs are not possible. But these trends are suggesting that transportation is likely not showing any benefit over in-river migration routes.

So in summary our preliminary review of fall chinook PIT tag data is not showing a benefit from transportation over in-river migration. Given this information it may prove more advantageous to the migrating fall chinook to adopt a spread the risk policy for fall chinook (similar to spring chinook) and adopt improved in-river migration strategies.

Table 1. Smolt-to-adult survival rates (SARs) from LGR-to-LGR for PIT tagged hatchery and wild subyearling fall chinook released in the mainstem Snake and Clearwater rivers above Lewiston, Idaho, within three categories of outmigration status.

Subyearling fall chinook migration year 1995
(includes 90 smolts partially outmigrating in 1996)

category	smolts	adults	SAR
C0	296	24	8.11%
C1	5,021	45	0.90%
T	1,338	10	0.75%
LGR pop.	**category#**	**%categories in pop.**	
7,049	6,655	94.4%	

Subyearling fall chinook migration year 1996
(includes 217 smolts partially outmigrating in 1997)

category	smolts	adults	SAR
C0	794	23	2.90%
C1	9,060	46	0.51%
T	1,105	4	0.36%
LGR pop.	**category#**	**%categories in pop.**	
11,232	10,959	97.6%	

Subyearling fall chinook migration year 1997
(includes 607 smolts partially outmigrating in 1998)

category	smolts	adults	SAR
C0	4,453	21	0.47%
C1	37,754	55	0.15%
T	2,831	4	0.14%
LGR pop.	**category#**	**%categories in pop.**	
45,803	45,038	98.3%	

Subyearling fall chinook migration year 1998
(includes 490 smolts partially outmigrating in 1999)

category	smolts	adults	SAR
C0	3,270	31	0.95%
C1	44,801	83	0.19%
T	2,174	9	0.41%
LGR pop.	**category#**	**%categories in pop.**	
50,400	50,245	99.7%	

Subyearling fall chinook migration year 1999
(no smolts outmigrated in 2000)

category	smolts	adults	SAR
C0	2,479	210	8.47%
C1	19,155	254	1.33%
T	2,428	21	0.86%
LGR pop.	**category#**	**%categories in pop.**	
24,280	24,062	99.1%	

Subyearling fall chinook migration year 2000
(includes 223 smolts partially outmigrating in 2001)

category	smolts	adults	SAR
C0	423	10	2.36%
C1	5,391	35	0.65%
T	919	6	0.65%
LGR pop.	**category#**	**%categories in pop.**	
6,832	6,733	98.6%	

Subyearling fall chinook migration year 2001
(only jacks and 2-salt available, approx 50% of return)
(includes 247 smolts partially outmigrating in 2002)

category	smolts	adults	SAR
C0	2,737	59	2.16%
C1	11,992	40	0.33%
T	30,596	57	0.19%
LGR pop.	**category#**	**%categories in pop.**	
45,621	45,325	99.4%	

Legend for categories (CJS survival estimates are used to convert smolt numbers to LGR equivalents)

C0	Undetected at 4 transport sites, but surviving to MCN tailrace
C1	Detected at one or more of 4 transport sites
T	Transported at one of 4 transport sites regardless of prior detection upstream

Table 2. Smolt-to-adult survival rates (SARs) for fall chinook completely holding over to migrate as yearlings for PIT tagged hatchery and wild subyearling fall chinook released in the mainstem Snake and Clearwater rivers above Lewiston, Idaho, within two categories of outmigration status.

Migration year 1995 fall chinook completely outmigrating in 1996 (66 smolts detected)

category	smolts	adults	SAR
C	54	0	0.0%
T	12	0	0.0%

Migration year 1996 fall chinook completely outmigrating in 1997 (436 smolts detected)

category	smolts	adults	SAR
C	375	5	1.3%
T	61	1	1.6%

Migration year 1997 fall chinook completely outmigrating in 1998 (814 smolts detected)

category	smolts	adults	SAR
C	733	9	1.2%
T	81	0	0.0%

Migration year 1998 fall chinook completely outmigrating in 1999 (862 smolts detected)

category	smolts	adults	SAR
C	817	27	3.3%
T	45	2	4.4%

Migration year 1999 fall chinook had no outmigrants detected in 2000 due to detection of old 400 kHz PIT tags.

Migration year 2000 fall chinook completely outmigrating in 2001 (504 smolts detected)

category	smolts	adults	SAR
C	467	8	1.7%
T	37	0	0.0%

Migration year 2001 fall chinook completely outmigrating in 2002 (1,049 smolts detected) (only jacks and 2-salt available, approx 50% of return)

category	smolts	adults	SAR
C	1,017	48	4.7%
T	32	2	6.3%

Legend for categories (no survival estimates available to convert smolt numbers of fish totally outmigrating as yearlings to LGR equivalents as subyearlings)

C	Detected at any of 7 dams with PIT tag detection capability totally in the year following the migration year
T	Transported at one of 4 transport sites regardless of prior detection upstream in the year following the migration year

Table 3. Smolt-to-adult survival rates (SARs) from McNary-to-Bonneville Dam for subyearling fall chinook PIT tagged and released from McNary Dam within two categories of outmigration status.

Subyearling fall chinook migration year 1999
(tagged fish released for gatewell or tailrace location)

Category	smolts	adults	SAR
C	45,880	83	0.18%
T	2,224	2	0.09%

Subyearling fall chinook migration year 2000
(tagged fish released for gatewell or tailrace location)

category	smolts	adults	SAR
C	48,862	257	0.53%
T	608	0	0.00%

Subyearling fall chinook migration year 2001
(tagged fish released for barge or river location)
(only jacks and 2-salt available, approx 50% of return)

category	smolts	adults	SAR
C	38,594	29	0.08%
T	23,196	18	0.08%

Legend for categories

C	McNary tailrace or river routed PIT tagged smolts
T	Gatewell fish detected on raceway/sample room routes on transportation days or fish routed to barge routed and not subsequently detected at a downstream dam

The importance of spill for fish passage in August
Fall chinook adult returns, migration timing as juveniles

Most of the analyses that have been conducted to date exploring the impact of eliminating spill in July and August have been based on a single set of conditions in the SIMPAS model using point estimates of juvenile data and average juvenile passage distribution data. We considered the available empirical data. We reviewed all of the adult PIT tagged fall chinook that were detected in the hydrosystem as juveniles and determined when they were observed in the hydrosystem as juveniles. This was done in order to understand the importance of spill for fish passage in August at Ice Harbor and in the Lower Columbia River.

The following tables show the proportion of adult PIT tagged fall chinook returns, which passed McNary and Lower Granite Dam in August versus July as juveniles. These tables show that a significant proportion of returning adults may pass the projects in August. In addition, with an average 15-day travel time from Lower Granite to Ice Harbor, the returning adult, juvenile data indicates that a large proportion of Snake River juvenile fall chinook that survive to adult pass through the lower Columbia River in August.

The adult data raises serious questions about the reliance upon the SIMPAS juvenile model analysis to predict impacts of changing summer spill for fish passage from the BiOp operations when the empirical data seems to suggest a more dramatic potential effect of terminating spill.

Table 4. Juvenile Passage Timing, at Lower Granite Dam of PIT tagged fall chinook, which survived to return as adults (see separately attached plots)

Year Juvenile Migration	Transported 6/20-7/31	Transported 8/1-8/31	In-River 6/20-7/31	In-River 8/1-8/31
1995	16.67%	16.67%	16.67%	36.67%
1996	0.00%	50.00%	12.20%	43.90%
1997	50.00%	0.00%	45.95%	21.62%
1998	80.00%	0.00%	38.00%	28.00%
1999	26.32%	68.42%	30.98%	26.63%
2000	0.00%	33.33%	39.13%	21.74%
2001	33.33%	17.95%	44.83%	31.03%

Table 5. Juvenile Passage Timing, at McNary Dam of PIT tagged fall chinook, which survived to return as adults (see separately attached plots)

Year Juvenile Migration	Transported 7/1-7/31	Transported 8/1-8/31	In-River 7/1-7/31	In-River 8/1-8/31
1995	0.00%	0.00%	10.53%	10.53%
1996	0.00%	0.00%	0.00%	50.00%
1997	0.00%	0.00%	38.46%	46.15%
1998	0.00%	50.00%	53.85%	46.15%
1999	0.00%	100.00%	17.07%	70.73%
2000	0.00%	0.00%	37.50%	37.50%
2001	50.00%	0.00%	16.67%	16.67%

The above data indicates that a significant proportion of returning adults may pass projects in August as juveniles. From the Table below, it is interesting to note that during years when a high percentage of returning adults passed McNary Dam as juveniles during August, spill and flow levels during August were also high in the Lower Columbia River. For example, in 1999, 70.73% of returning PIT tagged adults passed McNary dam in August as juveniles. Spill during August of 1999 was high across all Lower Columbia Projects (see table below), and McNary spilled throughout all of August. August flows were the highest (on average) between the years of 1995 and 2001 at McNary Dam.

	Bonneville August Spill Volume (Kaf)	The Dalles August Spill Volume (Kaf)	John Day August Spill Volume (Kaf)	McNary August Spill Volume (Kaf)	McNary August Average Flow (Kcfs)
1995	5059	4670	253	0	138.2
1996	5594	6143	2350	2072	183.3
1997	6563	7621	2533	2862	198.4
1998	5276	4096	2659	317	142.1
1999	5403	7876	3678	3382	208.5
2000	5464	3351	3067	320	140.4
2001	2396	2025	0	0	96.8

Flow and passage distribution and predicted impacts

Elimination of summer spill could be especially detrimental to fall chinook during low flow years, when the subyearling migration is shifted later into the summer. Because BPA did not analyze this scenario, their estimated adult impacts would be underestimated. Juvenile fall chinook passage data shows that passage distribution is affected by flow. The agencies and tribes recent comments on the BPA summer spill analysis (State, Federal and Tribal Fishery Agencies Joint Technical Staff Memorandum, 2/20/04) illustrated the shift in passage timing relative to migration flow level. The BPA summer spill analysis using SIMPAS was done only for average flow conditions. However, the SIMPAS predicted impacts of eliminating summer spill will be highly influenced by the passage timing distribution utilized in the analysis. The following analysis utilizing the SIMPAS model incorporates a passage distribution that could be expected based upon historical data under low flow conditions. This illustrates the range of potential adult impacts that could be expected.

1) Reach Survival Estimates Using SIMPAS

Reach	BiOp Operation	No Spill Operation	Difference
IHR to Bon	26.4%	15.9%	**12.0%**
MCN to Bon	30.0%	19.8%	**11.6%**
JDA to Bon	44.6%	32.0%	**13.0%**
Tda to Bon	69.4%	56.2%	**14.0%**
Bon to Tailrace	82.4%	74.6%	**8.2%**

In our analysis a 4% increase in pool mortality is assumed. The 2000 BiOp assumed a 5% percent increase in pool survival if the RSW and other aggressive non-breach options were implemented. Therefore if spill, a primary route of passage, is removed it should result in a 4% increase especially under low flow conditions that occur in August. BPA in their SIMPAS analysis assumed 1% at JDA and IHR and 0.5% at Bonn and TDA, and no change at McNary. Other differences are sluiceway guidance at Bonneville Powerhouse II; we used 33% based on radio tag data, while 46% was used by BPA based on hydro acoustic, research results; we decreased survival through the sluiceway when no spill was present from 98% to 96.5%; nighttime spill at Bonneville was set at 125 kcfs in the BPA analysis where as we set it at closer to 145 kcfs; also we used NMFS information of 89% survival fro McNary bypass, BPA used 97%. We also included the assumption that transported fish survival is a constant through both operations. There are small changes in numbers throughout the model depending on which recent reports were used to update parameters.

2) Population Estimates for ESA Listed Fish Only

For estimating impacts to ESA listed fish, we assumed that 1.1 million fish collected at LWG and 50.9% are wild and that the FGE is .534. This results in a starting population at LWG of 1.05 million juveniles.

Using SIMPAS, fish were routed through the collection systems and removed for transportation, resulting in an estimated 8% of the juveniles survival to IHR with a spill operation and 7.0% under a no spill operation. This results in an estimated population between 83,535 and 80,713 would be the extreme difference on population respectively, depending on run timing of those fish.

3) Juvenile Run Time Estimate for Snake River Fish

Using migration timing data from the FPC, the range of SARs is 8% to 43%. (Attachment 1) With the assistance of FPC an estimate of between 8% and 25% of fish would still be above Bonneville after August 1. (Also Attachment 1)

4) Overall Impact to ESA Listed Fish

Using the above numbers and assuming an SAR of .1 (Bowes, 2004) the potential range of adult equivalent mortalities is **46 - 192 adults**. A portion of this number are fish that are passed McNary but have not passed Bonneville dam before August 1. BPA did not account for these fish, nor did they account for extra mortality for transported fish. For additional information on SAR assumptions refer to Bowes, 2004. Adult impacts due to fallback through turbines and bypass systems versus fallbacking through spillways have also not been incorporated into this analysis. Assuming that BPA correctly estimated that adult return for listed Snake River Species to be 2396 then a range of 46 to 192 listed adults would equate to a percent of 1.2% to 8% of this population.

Lastly Option C, which is now the federal proposal, includes a spill evaluation at Bonneville Dam of testing 50 kcfs spill 24 hours versus the BiOp operation. This equates to roughly a 1.8% survival reduction for Bonneville passage. No analysis on this impact to inriver migrants has been completed.

Recommended system wide fall chinook life cycle smolt-to-adult return monitoring program.

Our review shows that there is inadequate fall chinook smolt to adult return and life cycle data available to assess recovery and assessment of hydrosystem measures. We have proposed a marking program that encompasses stocks throughout the Columbia Basin. The rationale is to monitor survival rates to assess, protection, recovery, restoration measures.

Our review of the available PIT tag data on fall chinook surviving to adult and review of the juvenile data which was utilized to model predicted impact on adult returns of fall chinook clearly show that a systemwide smolt to adult return life-cycle evaluation program needs to be put into place in 2004. The following is an outline for a proposed fall chinook evaluation.

The evaluation is proposed over a six year time period, evaluating the Biological opinion flow and spill measures against the Bonneville Power Administration no spill measures including no summer spill in the Snake River and no spill for fish passage in August in the lower Columbia River. PIT tagging efforts need to be in place in 2004 to evaluate and monitor the action agencies no summer spill operation for 2004 through 2006. Then, when transmission issues are resolved, implementation of BiOp summer spill and flow measures and, in addition, spill at the Snake River Projects, and at McNary will be evaluated in 2007 through 2009.

Objectives:

- Estimates of smolt-to-adult return rates for transported versus in river migrating fall chinook during the action agencies no spill option.
- Estimates of smolt-to-adult return rates for transported versus in-river migrating fall chinook during the BiOp summer flow, spill, with spill at the Snake River projects and McNary Dam, evaluation period.
- Juvenile fall chinook reach survival estimates throughout both periods.
- Juvenile fall chinook passage distribution and passage timing at Snake River and Lower Columbia River projects for both evaluation periods.

Approximate numbers of PIT tagged Chinook Salmon Required to Estimate Juvenile to Adult Survival in the Snake/Columbia River Basin.

PIT tag quotas vary depending on where fishes are released or captured tagged and released in the basin. Normally, the further upstream or distance traveled in the river system will relate to greater mortality by the time it reaches the sampling site. In addition, subyearling chinook are more vulnerable to predation and other factors that tend to reduce juvenile survival through the hydrosystem. Tables are listed below for the different reaches that have hatcheries or wild salmon groups where representative groups of fish could be PIT tagged in the Columbia River basin.

From McNary Dam to Bonneville Dam, marking subyearling fall chinook (URBs) would require that an estimate could be completed at Bonneville Dam where possible. The key elements would be survival as juvenile fish to Bonneville and return as adult fish back to Bonneville Dam. Survival to adult fish would vary by year, but numbers normally be considered from 0.5% to 2% as a base return. Since there is no transportation involved, there is no requirement to achieve a minimum/maximum number of fish going the different routes of passage at a dam. The Bonneville and John Day Dam estimate for detection at the respective

sampling site is set at 28% and 32%. The collection efficiency of the bypass system is simply the (1-spill proportion) times FGE, given the assumption of a 1:1 spill effectiveness.

Marking sites tentatively considered in this section of river are: Umatilla River hatchery and acclimation ponds, Klickitat Hatchery and Little White Salmon Hatchery. For wild subyearling fall chinook, the Deschutes River and John Day River would provide groups to assess survival from the upper end of this Reach to the Bonneville pool release groups.

Table. Estimated Number of PIT tagged fall chinook required to complete SARs for the Individual River basins (McNary Dam to Bonneville Dam Reach)

Hatchery	**# Juvenile chin PIT tagged**	**# Juvenile Chin at Bonneville Dam**
Umatilla	35,000	10,500
Thornhollow Pond (Umat)	35,000	10,500
Total Umatilla	**70,000**	**21,000**
Klickitat	50,000	20,000
Little White Salmon	40,000	20,000
Wild Fall Chinook		
Deschutes R	50,000	20,000
John Day R	Potential mark group	20,300

Note that SARs for the individual groups should equal about 200 adult fish per release area spread among 1 to 4 adult return years. In initial years the Wild fall chinook would be marked to assess migration timing to assure that they arrive at the dams when spill and best passage conditions exist in the hydro-system.

PIT tag quota for two major release groups of subyearling fall chinook from the Mid-Columbia or Hanford Reach have been calculated in past years to achieve detection rates at McNary Dam to achieve transportation/inriver groups of test fish. The hatchery of choice would be Priest Rapids Hatchery with the wild component from Hanford Reach. These groups will provide transport and inriver survival through the hydrosystem.

Table. Estimated number of subyearling fall chinook required to calculate SARS for the individual release groups of hatchery and wild fall chinook in the Mid-Columbia River. [Priest Rapids and Hanford Reach]

	# of Chin-PIT tagged	**# Inriver below McNary Dam**	**# of Trans. Required**
Hatchery Chinook			
Priest Rapids	150,000	43,000	43,000
Wild Chinook			
Hanford Reach	185,000	33,700	52,000

With no transportation required for these two groups, i.e., fish were placed directly back to the river at McNary Dam, about 80,000 fish from each release group (Priest Rapids and Hanford) could be PIT tagged to achieve SARs for the inriver migrants.

Table. Estimated number of subyearling fall chinook required to calculate SARS for the individual release groups of hatchery fall chinook in the Snake River Basin Recommended offset for elimination of spill

Hatchery	# of Chin-PIT tagged	# Inriver below LGR Dam	# of Trans. Required
Snake/Clearwater Acclim Ponds	350,000	80,000	32,000

These groups of subyearling fall chinook would be used to evaluate smolt-to-adult survival rates (SARs) for transported and inriver migrants. In addition, this will provide information on inriver survival and timing through the hydrosystem.

CC: FPAC
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Rod Sando, DBFWA
Fred Olney & Howard Schaller, USFWS
Sharon Kiefer & Pete Hassemer, IDFG
Ed Bowles & Tony Nigro, ODFW

Attachment 1

McNary Percent passage data is presented in Table 1. Also included is the proportion of fish in transit between McNary and Bonneville dams if spill were shut off either July 15 or August 1. We calculated wild origin subyearling chinook timing based on PIT-tag detections at McNary. Then used an average of 8 days travel time McNary to Bonneville Dam. Looking back at McNary to those fish that passed 8 days prior to the proposed shut off date provided the begin percent passage. Subtracting the begin percent from the end percent (the percent passage on the shutoff date) yielded the percent in transit. To calculate percent in transit between McNary and John Day and John Day and Bonneville I would recommend apportioning half of the in transit percentage to each reach.

Using passage timing of Wild Origin subyearling chinook in the Snake River basin we used Lower Monumental detections to develop passage timing expressed as a percent of all annual detections (excluding holdover fish). We then moved back 3 d at Lower Monumental to extrapolate the data for IHR (Table 2). In other words, a passage percentage of 11% at Ice Harbor on 7/15 would have passed Lower Monumental on 7/12 or 3 days earlier based on assumed 3 day travel time.

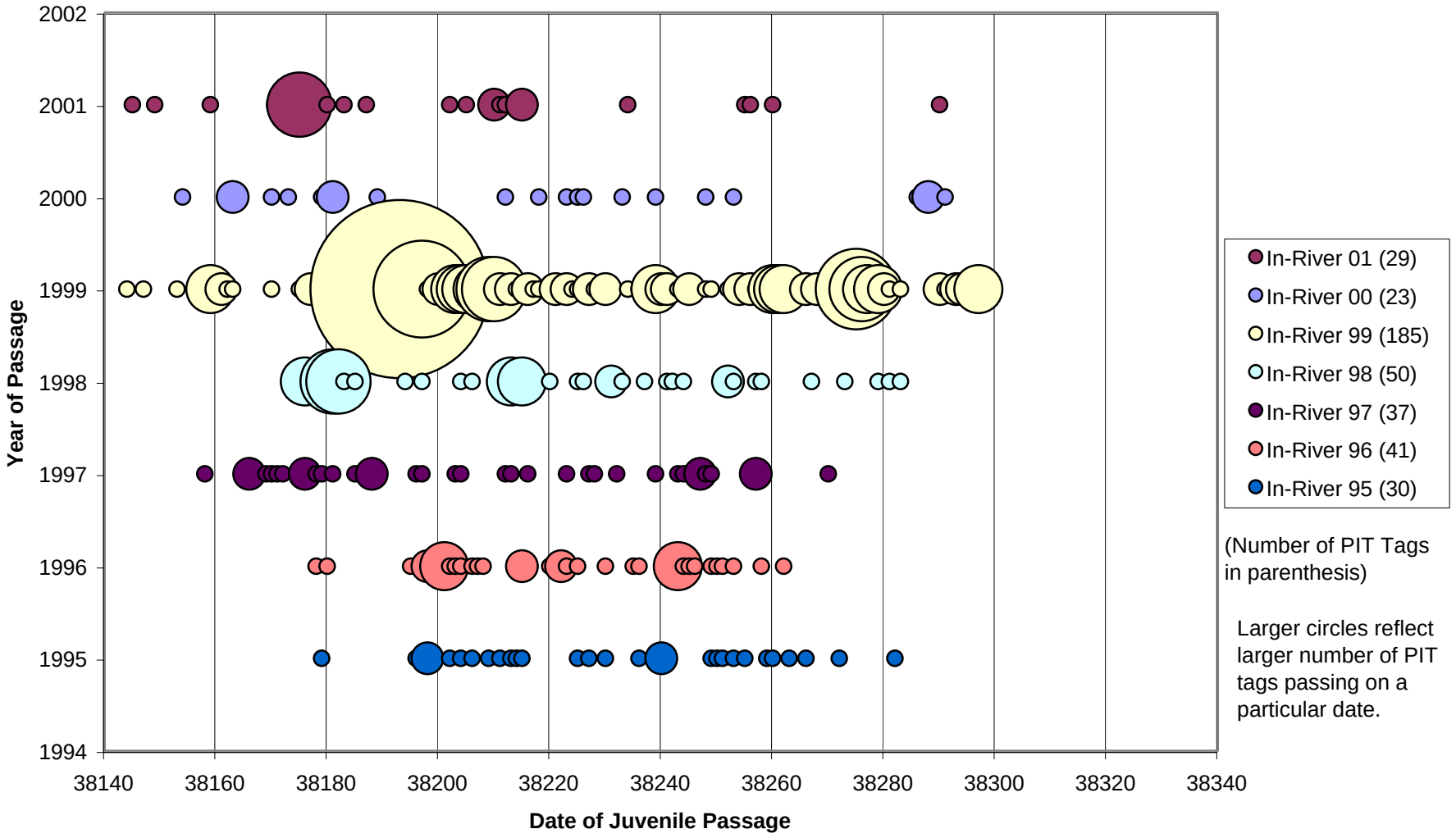
Table 1. Percent of Snake Origin Wild Subyearling chinook affected by End of Spill Operations in Lower Columbia.

	McNary Passage Percent		Percent Pop In Transit (between MCN and BON) at End of Spill	
Date	**7/15**	**8/1**	**If 7/15**	**If 8/1**
1998	41%	87%	13	25
1999	41%	60%	7	8
2000	79%	92%	13	8
2001	10%	57%	1	23
2002	52%	94%	22	16
2003	56%	85%	10	11

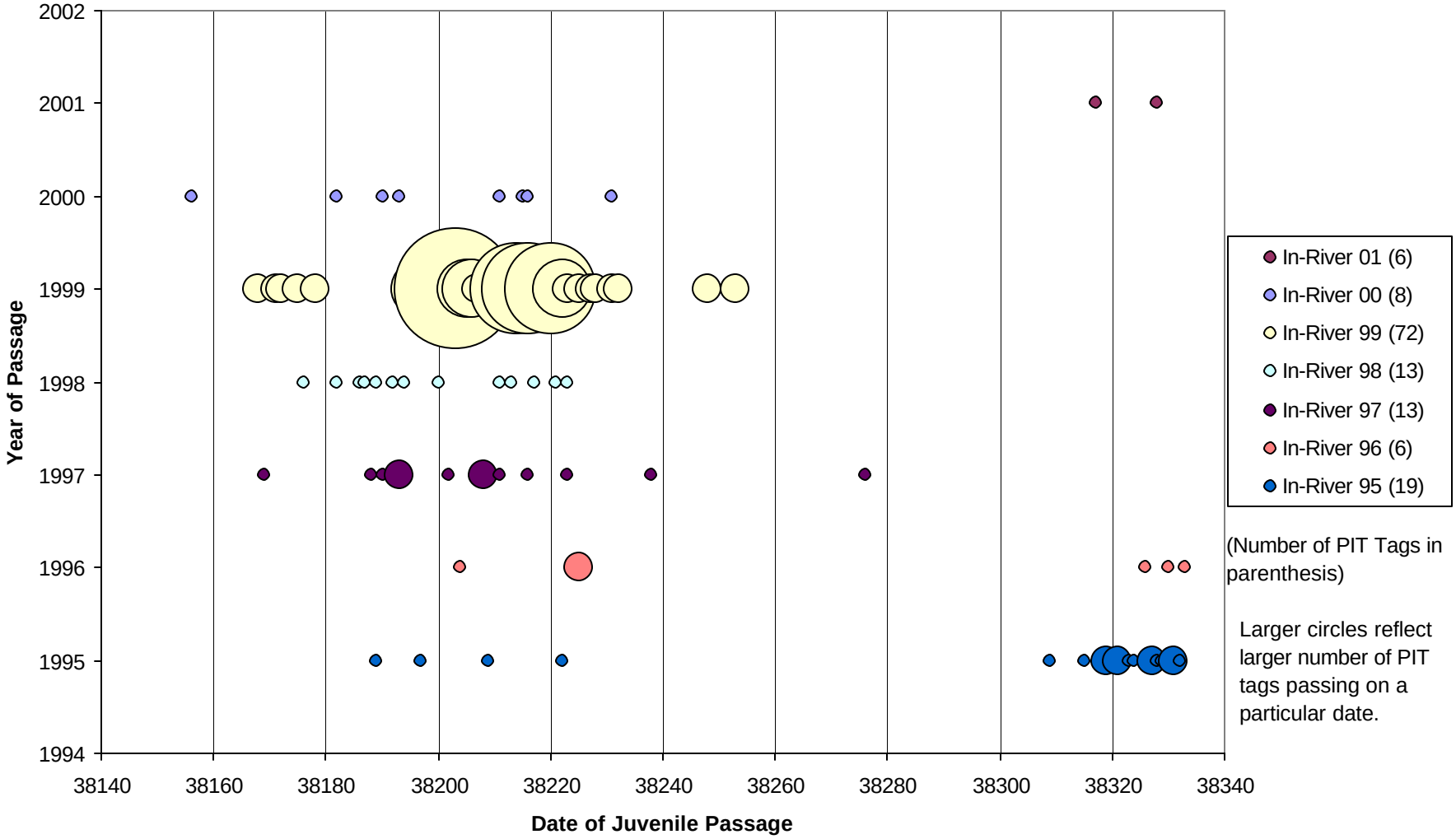
Table 2. Passage Timing at Ice Harbor dams for Wild Subyearling chinook based on 3-day Travel Time from LMN to IHR.

Date	**7/15**	**8/1**
1994	11%	41%
1995	5%	36%
1996	16%	53%
1997	44%	56%
1998	17%	82%
1999	47%	69%
2000	64%	76%
2001	7%	64%
2002	30%	89%
2003	55%	80%

Juvenile Passage Timing at Lower Granite Dam for In-River Fall Chinook that Survived to Adulthood (1995-2001)



Juvenile Passage Timing at McNary Dam for In-River Fall Chinook that Survived to Adulthood (1995-2001)



Attachment D

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MEMORANDUM

TO: Rob Lothrop, CRITFC

Michele DeHart

FROM: Michele DeHart

DATE: December 17, 2003

RE: Summary of Documented Benefits of Spill

In response to your request of December 11, 2003, the Fish Passage Center staff prepared the following summary of information addressing the benefits of spill for fish passage. The benefits of spill for fish passage are well established and accepted throughout the scientific community. There is substantial data and literature documenting the direct and indirect benefits of spill for fish passage. In some river reaches and some time periods, such as the lower Columbia River during the summer migration period, spill for fish passage is the only protection measure that has been provided consistently. For some stocks of salmonids such as Klickitat River, Umatilla River and other lower river tributaries spill is the only passage protection measure provided.

Juvenile Passage; Spill; and Total Dissolved Gas

Background

When fish approach a hydroelectric project they can either enter the powerhouse or continue migrating downstream by passing over the spillway. Upon entering the powerhouse fish either pass through a turbine unit or are mechanically collected and bypassed downstream without passing through the turbines. Employing the use of spill for juvenile migrants has long been used as an effective management tool for improving passage survival of migrating juvenile salmon at mainstem hydroelectric projects. Routing smolts through spillways at hydroelectric projects in the Columbia and Snake rivers is generally considered to be the safest passage strategy, when compared to the passage survival through bypass systems and turbine routes.

Prior to 1993 when the first Biological Opinion was issued, spill was used as mitigation at hydroelectric projects to enhance project survival for juvenile salmonids. Historically, spill occurred operationally, when project capacity or system generation needs were exceeded. As the hydrosystem was developed it became more efficient through such actions as the construction of

the DC and AC Intertie transmission lines. As a consequence the occurrence of spill declined, accelerating the disagreements between operators and regulators and the fishery agencies regarding the provision of spill. In December of 1988 a 10-year spill program was developed for implementation of spill at projects that were not equipped with adequate bypass systems to achieve a fish passage efficiency goal. (Fish Spill Memorandum of Agreement).

As fish stocks continued to decline and were listed under the Endangered Species Act, it became clear that the negotiated contracts were not aggressive enough to recover endangered stocks. This lead to the modification of spill programs under the different versions of the Biological Opinion. At the same time that spill was identified as a key element in the recovery of listed stocks, the need to meet the objectives of the Clean Water Act was also identified. Spill causes increased levels of total dissolved gas that could increase mortality and eliminate the benefits associated with the implementation of an aggressive spill program. Therefore, subsequent implementation of a spill program has been within the confines of the "risk" associated with increased levels of total dissolved gas

Decreasing Migration Delays and Predation

Spill and Decreases in Delay associated with Project Passage

Spill is an effective tool in decreasing the amount of delay experienced by fish in forebays and tailraces of dams where predator populations and predation rates are highest. Beamesderfer and Rieman (1991) found that forebay populations of northern pikeminnow (*Ptychocheilus oregonensis*) and smallmouth bass (*Micropterus dolomieui*) were present in substantial numbers in the forebay of John Day Dam. Poe et al. (1991) reported that the diet of northern pikeminnow in the forebay of John Day Dam was 66% salmonid smolts. This suggests that delay of outmigrants in the forebay could reduce survival due to increased predation, and project operations such as daytime spill that decrease forebay residence time could increase survival. In addition, spill was also shown to be an important factor in reducing forebay delay in studies conducted by Snelling and Schreck (1994).

Hansel et al., (1999) showed that in general, yearling chinook salmon and steelhead that arrived in the forebay when no spill occurred tended to delay. Yearling chinook salmon and steelhead that arrived at night, concurrent with spill, passed the dam more readily. Residence times of yearling chinook salmon were markedly reduced with respect to daytime spill, whereas steelhead residence times decreased only slightly in the presence of daytime spill. When daytime spill went from 0 to 30% yearling chinook salmon residence time dropped from 8.5 h to 0.8 h in 1999 and 9.0 h to 2.4 h in 2000, while yearling steelhead residence time decreased from 11.4 to 11.3 h in 1999 and 11.4 to 9.4 h in 2000. Data collected in 1999 and 2000 suggest that hatchery steelhead (>200 mm) may delay in the John Day Dam forebay longer than wild steelhead (<200 mm). (NOAA, 2000)

Dispersal of Predators

Spill establishes a large flow net with increased velocity that disperses predators from the forebay and tailrace areas thus reducing the potential for predator/prey interactions (Faler et al.,

1988). The concept of developing spill patterns at FCRPS dams specifically for fish passage was first addressed systematically in the 1960s to facilitate adult salmon passage into the adult fish collection systems. Junge (1967) observed improved adult salmonid passage under intermediate to large spill volumes if four or five gates at each end of the spillway were at low volume settings. At large dams this resulted in a tapered spill pattern near each end and a flat spill pattern across the central portion of the spillway. At smaller dams this produced a "crowned" pattern across the entire spillway tailrace, with the highest discharge in the middle bays. The success of adult salmon passage was evaluated by comparing ladder passage counts associated with various spill patterns. The spill patterns developed that appeared best for adult passage conflict with what is thought today to be best for juvenile passage (high shoreline velocities), since Junge kept near-shore velocities low to facilitate adult migration and passage into fishway entrances located along shorelines (NOAA 2000). Smolt residence time in spillway tailraces is likely influenced by spill volume and pattern. High spill volume and water velocity push water and presumably juvenile salmonids out of the immediate tailrace, and help redistribute piscivorous predators (northern pikeminnow) away from the immediate spillway tailrace, reducing potential predation opportunities (Faler et al. 1988).

Shively et al. (1996) found that ambient river flow velocities of at least 1 m/s were necessary to keep northern pikeminnow from holding in areas near bypass outfalls, and that the degree by which water velocity eliminated northern pikeminnow holding increased as outfall distance from shore and water depth increased. Hansel et al. (1993) found that hydraulic cover such as eddies and backwaters at velocities below this threshold were preferred northern pikeminnow feeding habitats, particularly when near primary smolt outmigration paths. Spill patterns that facilitate rapid juvenile egress from the spillway stilling basin through the tailrace likely increase juvenile survival. Current spill patterns are developed to increase the survival of juvenile fish through tailraces, by emphasizing minimizing hydraulic cover and maintaining high water velocities near spillway shorelines. To not interfere with daytime adult passage, these juvenile spill patterns are often employed during nighttime hours only (COE, 1999d; NOAA 2000).

Spillway Survival

Whitney et al. (1997) reviewed 13 estimates of spill mortality for salmonids (3 steelhead and 10 salmon) published through 1995 and concluded that 0 to 2% is the most likely mortality range for standard spillbays. They also pointed out that local conditions, such as back eddies or other situations that may favor the presence of predators, may lead to higher spill mortality.

Some point estimates for mortality in spillbays with spill deflectors are higher than estimates for spillbays without deflectors. For example, the highest estimates of survival for yearling chinook salmon and steelhead at Snake River dams were obtained from spillbays without flow deflectors, ranging from 98.4 to 100% (Muir et al. 1995b, 1996, 1998). Although lower survival estimates were obtained from spillbays with flow deflectors (ranging from 92.7 to 100%) (Iwamoto et al. 1994; Muir et al. 1995b, 1998), differences in survival between the two types of spillbays compared pairwise were not significant at Little Goose (steelhead), or Lower Monumental Dams (yearling chinook salmon) (NOAA, 2000).

A number of methodologies have been used to estimate spillway survival at lower Columbia River dams, including identification of test fish by fin clips (Holmes 1952), freeze brands (Johnsen and Dawley 1974, Raymond and Sims 1980), coded-wire tags and freeze brands (Ledgerwood et al. 1990), balloon tags (Normandeau Associates Inc. et al. 1996a, b).

At Bonneville Dam, Holmes (1952) estimated that subyearling chinook salmon survival through the spillway was 96 to 97%, depending on how the data were analyzed. Johnsen and Dawley (1974) compared the survival of subyearling chinook salmon passing through spillbays with and without flow deflectors, and found that relative survival was 87 and 96%, respectively, and that these differences were not statistically different. Ledgerwood et al. (1990) found that survival of subyearling chinook through spillbay 5 was not significantly different than for fish released downstream. Based on the balloon-tag methodology, the calculated survival probabilities for deflector and non-deflector spillways were both 1.0 at Bonneville Dam, however, fish passing through a spillbay without a spill deflector displayed a slightly higher injury rate (Normandeau et al. 1996a; NOAA 2000).

Spill and Total Dissolved Gas

Spilling water can cause high dissolved gas to concentrate by entrainment of air in the form of bubbles as it passes over the spillway and plunges to the tailrace. The air is forced into solution, causing the water to become "supersaturated" at ambient atmospheric pressure with respect to dissolved gas. Water that is supersaturated with respect to dissolved gases may cause gas bubbles to form in the bodies of fish and other aquatic animals under certain conditions that impair their ability to function, or in extreme situations may lead to death. Consequently, spill management must recognize the tradeoff between survival benefits and the detrimental effects of high total dissolved gas levels.

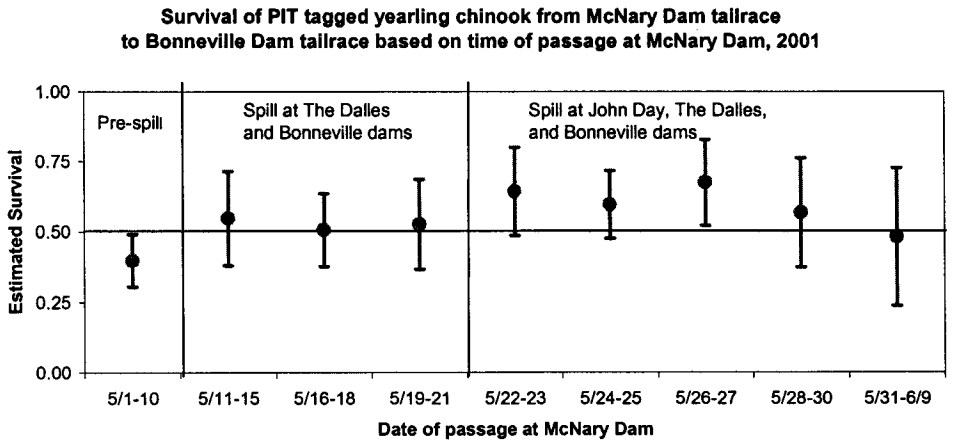
The "Spill and 1995 Risk Management" report was developed by the region's fishery agencies and tribes document and provided part of the biological justification for the implementation of the 1995 Biological Opinion spill program. The document reviewed all available studies and quantified the trade-off between the increase in salmon survival associated with an increase in spill passage, against the potential fish mortality that might be incurred from increased levels of total dissolved gas (TDG). The assessment concluded that the benefits of spill passage outweighed the risk up to TDG levels between 120 to 125%. The annual voluntary spill program has been implemented within these constraints since that time.

In 2000 the NMFS included Appendix E in their Biological Opinion. This appendix was meant to serve as the justification and risk assessment for the spill program included in the 2000 Biological Opinion. The appendix addresses the 120% dissolved gas ceiling and builds on the findings of the 1995 document with information collected subsequently. The NMFS also uses the SIMPAS model as a means of quantifying an amount of system survival attributable to the 120% TDG spill program. The NMFS concludes, "the risk associated with a managed spill program to the 120% total dissolved gas (TDG) level is warranted by the projected 4% to 6% increase in system survival of juvenile salmonids. Recent research and biological monitoring results support the findings of the 1995 report, which predicted that the TDG in the 120% to 125% range, coupled with vertical distribution fish passage information indicating that most fish

migrate at depths providing some gas compensation, would not cause juvenile or adult salmon mortalities exceeding the expected benefits of spillway passage. NMFS finds little evidence that this expected survival improvement would be reduced by the mortality related to gas bubble trauma (GBT). NMFS also concludes that physical and biological monitoring of GBT signs can continue to be used to indicate dissolved gas exposure in adult and juvenile salmon migrants."

System-wide Evidence for Spill Survival Benefits

Analysis of smolt survival in the lower Columbia River index reach in 2001 was performed with the year split into periods of passage at McNary Dam (FPC, 2001). The McNary Dam passage distribution of PIT tagged yearling chinook was split into nine multi-day blocks with at least 10,000 PIT tagged smolts per block. A plot of the estimated survival from McNary Dam tailrace to Bonneville Dam tailrace shows evidence of shifts in estimated survival for yearling chinook smolts passing McNary Dam in the May 1-10, May 11-21, and May 22-June 9 periods (Figure 44). One likely explanation of this apparent grouping of the survival data was that spill in the lower Columbia River index reach did not begin at The Dalles and Bonneville dams until May 16 or at John Day Dam until May 25.

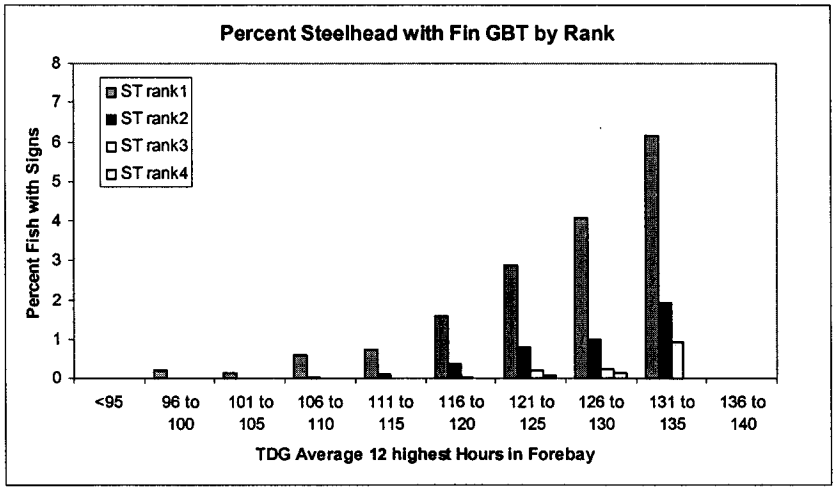


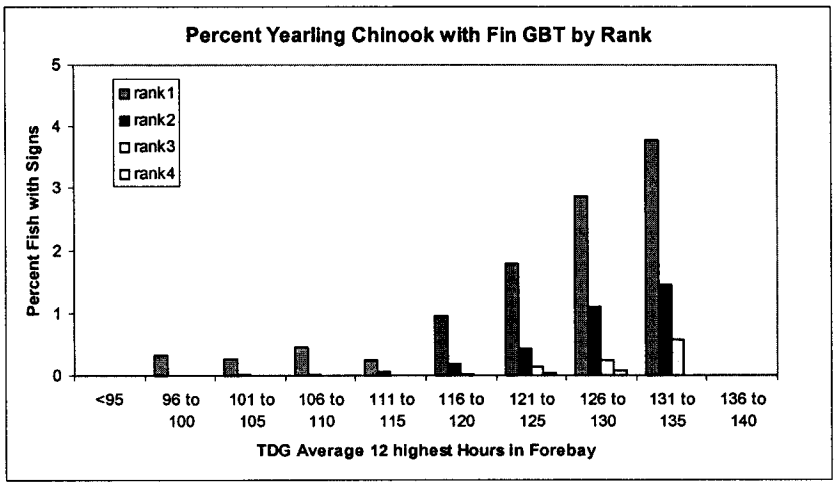
Analyses conducted by Muir et al. (2001) reconfirmed the findings of numerous earlier studies by demonstrating that spillway survival of smolts exceeds that incurred through both turbines and collector/bypass systems at dams on the Snake River.

Evidence for the Appropriateness of the Current Total Dissolved Gas Standards

The effects of elevated dissolved gas on migrating juvenile and adult salmon due to voluntary spill have been monitored each year of spill program implementation. Based on seven years of data from the biological monitoring program, the average incidence of gas bubble disease signs has been low, although the state-allowed maximum TDG due to spill was 120 percent in the tailrace and 115 percent in forebays during periods of voluntary spill. A high percentage of the spill that did occur in some years was involuntary, and often resulted in dissolved gas levels above the 120% waiver. The following graphs depict the incidence and severity of signs of GBT in fish collected for observation over the seven years, grouped in 5

percent TDG levels. Increases in the incidence of signs were observed with increases in the levels of TDG. The severity of signs also increased, but not until dissolved gas levels were above the 120 to 125% level.





These data suggest that total dissolved gas concentrations above 125% may have had a negative impact on survival. These high total dissolved gas measurements are a function of uncontrolled spill that occurred in the hydrosystem because of flow in excess of the hydraulic capacity of the project, or due to spill in excess of generation needs. They are not caused by the implementation of the Biological Opinion Spill Program.

Summary

All of the information collected to-date of survival and the benefits associated with spill indicate that spill provides a significant benefit to juvenile survival at levels up to 125% in the tailrace of the dam.

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Attachment E

State, Federal and Tribal Fishery Agencies Joint Technical Staff

US Fish and Wildlife Service

Columbia River Inter-Tribal Fish Commission

Idaho Department of Fish and Game

Oregon Department of Fish and Wildlife

National Marine Fisheries Service

Washington Department of Fish and Wildlife

June 13, 2003

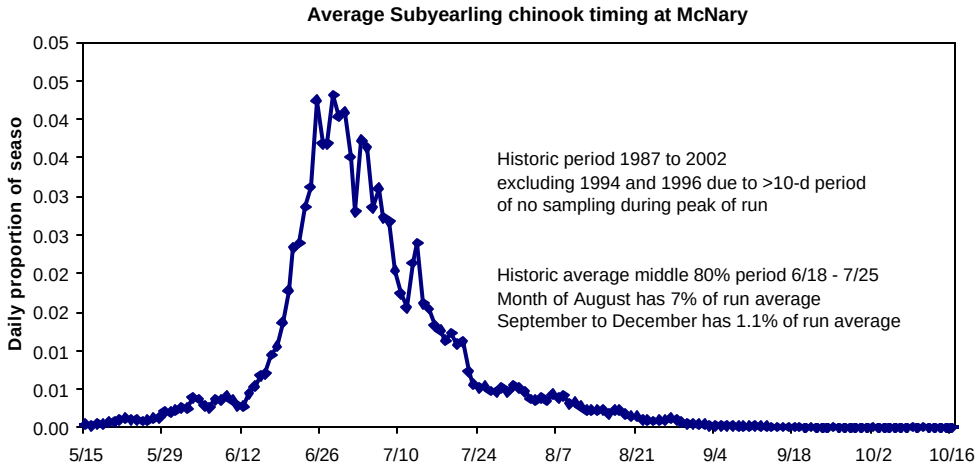
Mr. Doug Marker
Northwest Power and Conservation Council
851 SW Sixth Ave., Suite 1100
Portland, OR 97204

Dear Mr. Marker:

We have reviewed a recent analysis developed by Northwest Power and Conservation Council (Council) staff that addresses the question of the hydrosystem cost versus benefit of spill during the summer months. As our agencies have responsibility for salmon management in the Columbia Basin, our comments will focus on fish passage timing and the benefits of spill during the summer months. The graphs contained in the Council staff analysis are plots of passage indices and spill versus date. The passage indices used in the analysis include a combination of both hatchery and wild fish, and show that most of the fish pass through the lower Columbia River during July and, therefore, Council staff concludes that any changes to the summer spill program should be made in August.

We have reviewed the Smolt Monitoring Program passage data for the past thirteen years to determine the average proportions of combined hatchery and wild subyearling migrants present in the lower Columbia River during August. Based on the monitoring data approximately 7% of subyearling chinook migrants pass the McNary hydropower project during August (Figure 1).

Figure 1. Average subyearling chinook timing at McNary Dam.



However, plotting combined hatchery and wild chinook passage indices for subyearling chinook at the various spill sites does not present a complete picture and is a shortcoming of the analysis conducted by the Council staff. Different stocks of subyearling migrants, especially wild subyearlings, can display significantly different passage timing strategies. Hatchery releases and abundant stocks dominate the combined passage indices, whereas jeopardized stocks (with their low abundance) are underrepresented when displayed in this fashion.

The NOAA Fisheries recognized this phenomenon when they established planning dates for the provision of protection measures in the 1995 Biological Opinion. The 1995 Biological Opinion states that "Dates at which 95% of wild PIT-tagged subyearling chinook passed Lower Granite Dam were August 28, July 3, August 23 and September 1 in 1991, 1992, 1993 and 1994, respectively. Migration of juvenile fall chinook salmon to dams further downstream extends longer for fish not transported from Lower Granite Dam. The primary migration period for juvenile fall chinook salmon is defined as June 21 to August 31 in the Snake River and July 1 to August 31 in the lower Columbia River." These were the primary passage dates used to protect the majority of ESA listed wild fall chinook migrating from the Snake River through the lower Snake River and through Columbia River hydrosystem.

The Biological Opinion's August 31 date of the 95% passage for the subyearling fall chinook migrating from above Lower Granite Dam is conservative based on the more recent monitoring data (Table 1). There is some variability in the 95% passage date (ranging from August 16 to October 11) but it is not as extreme as observed in the earlier data set used by NOAA Fisheries. In part, this is a reflection of the more consistent sampling at Lower Granite Dam and marking above the project, but it is mainly a result of the improved survival shown for fish migrating in August due to improved summer flows and spill provided under the Biological Opinion beginning in 1995. Historically in low flow years (e.g. 1992), prior to the 1995 Biological Opinion, flows were extremely low during August and subyearling survival was low. This caused the passage indices to be truncated skewing the distribution towards an artificial earlier passage timing. The following table (Table 1) shows the 95% passage date at Lower

Granite Dam for the run at large, and for the wild PIT tagged population. In some cases the 95% passage dates do not correlate well for the wild PIT tagged fish and the population at large because of variations in PIT tagged fish sample size, as well as the timing and segment of the wild population marked.

Table 1. The 95% passage date at Lower Granite Dam for the run at large (hatchery and wild combined) and the wild PIT tagged fish.

YEAR	95% Passage Date Run at Large	95% Passage Date wild PIT Tagged Fish
1995	Oct 11	Sept 14*
1996	Sept 20	Aug 27
1997	Sept 23	Sept 14
1998	Sept 26	Aug 15
1999	Sept 22	Aug 15
2000	Sept 08	Sept 14*
2001	Aug 16	Aug 18
2002	Aug 31	July 28

*Last date category actual date may be later

As seen from Table 1 the 95% passage date often occurs late in September for the run at large and wild PIT tagged fish. With the exception of 2001 when the poor migration conditions likely truncated the population due to higher mortality rates, the August 31 planning date has not been adequate to protect 95% of the summer migrants. Thus the August 31 planning date represents a compromise where most of the fish are considered to be past Lower Granite Dam.

The salmon managers also expanded the analysis conducted by the Council staff by considering the passage timing of individual groups of subyearling fall chinook at the lower Columbia River hydropower projects. Available information is limited due to the relatively low abundance of these stocks and few numbers of fish marked. However, based on the PIT tag recaptures the following information is being provided: the Snake River Basin wild fall chinook passage timing at McNary Dam (Figure 2); the Hanford reach wild fall chinook passage timing at John Day Dam (Figure 3); and, the Yakima River Basin wild fall chinook passage timing at John Day Dam (Figure 4). We believe that these graphs more accurately reflect the passage of stocks of concern, which may be masked in a graph depicting the overall passage indices such as presented by the Council staff.

Figure 2. Snake River Basin wild fall chinook passage timing at McNary Dam.

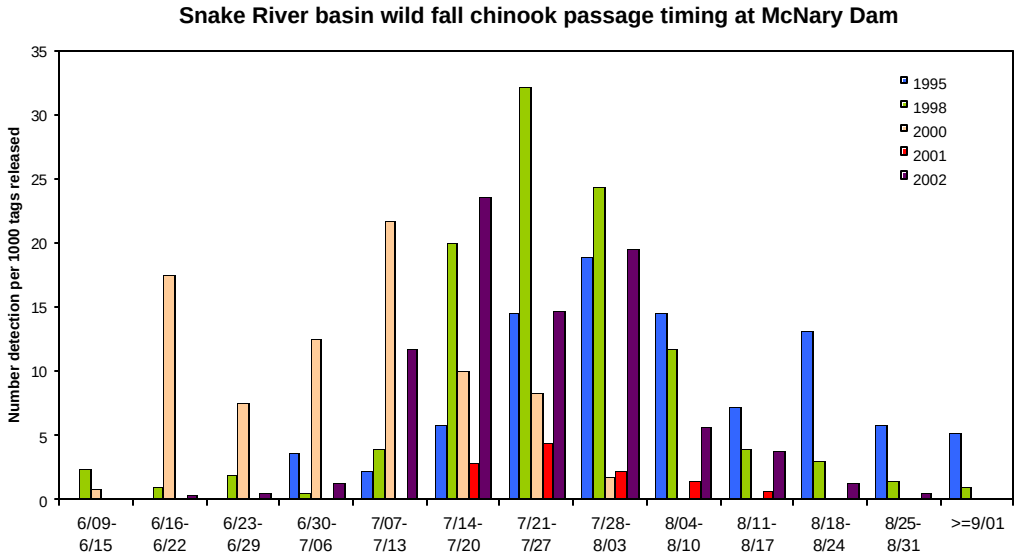


Figure 3. Yakima River Basin wild fall chinook passage timing at John Day Dam.

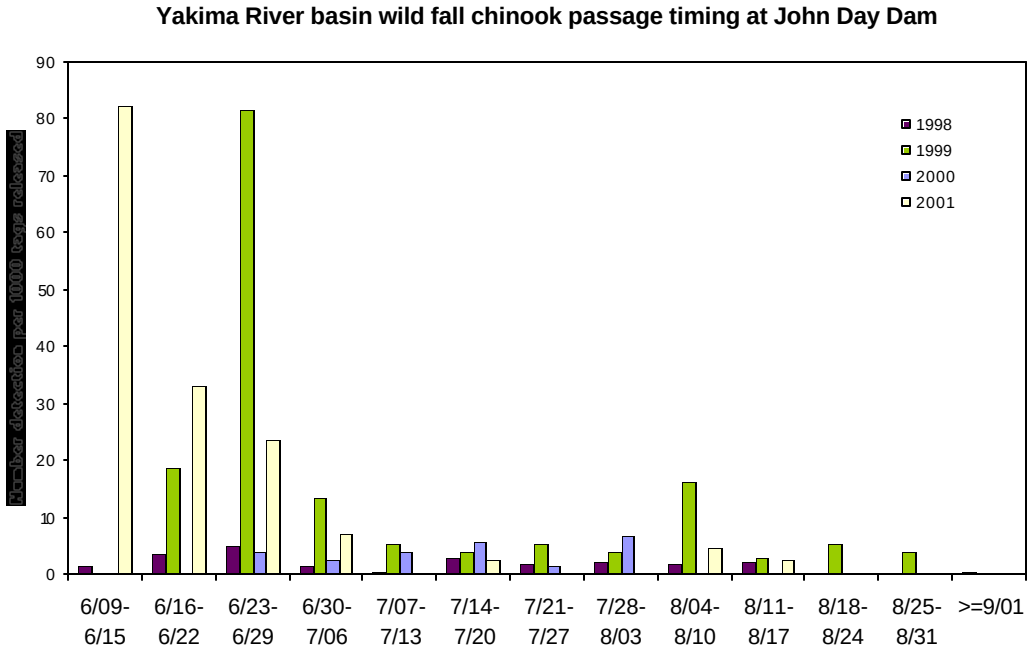


Figure 4. Hanford Reach wild fall chinook passage timing at John Day Dam.

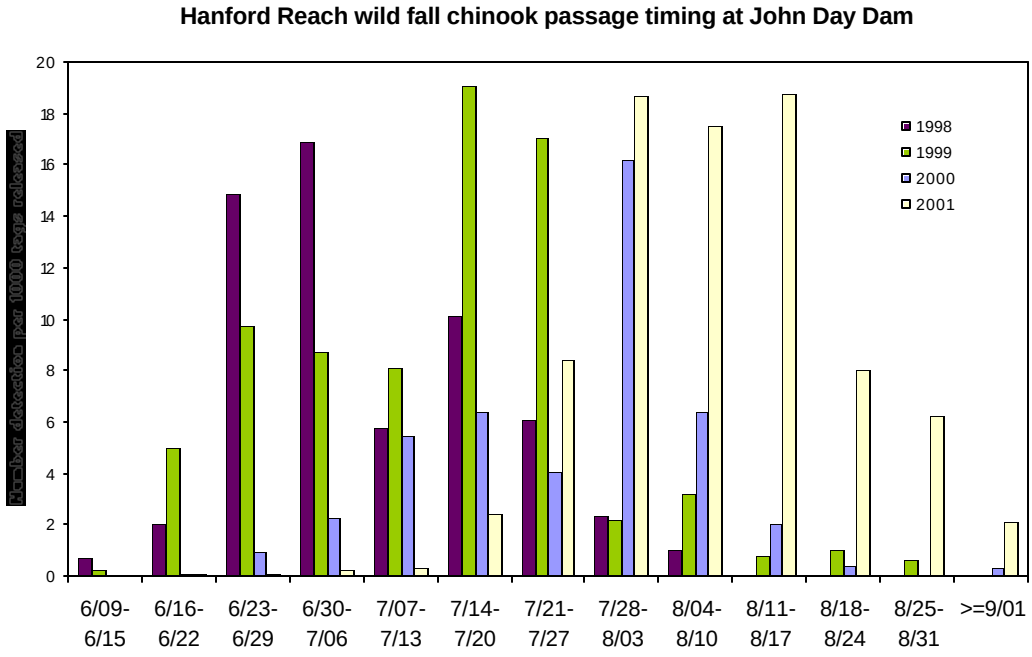


Table 2. Summary of proportions of individual groups of subyearling migrants passing through the lower Columbia during August.

Percentage of Subyearling Chinook Migrants Observed during August			
Year	**Snake River Wild***	**Yakima River Wild****	**Hanford Reach Wild****
1995	48.8		
1998	19.6	19.6	2.3
1999		20.0	9.2
2000	7.8	20.8	44.7
2001	21.4	4.5	66.7
2002	19.1		

* Observed at McNary Dam
** Observed at John Day Dam

As can be seen from both the graphs and Table 2, significant proportions of individual groups of subyearling migrants can and do pass into and through the Lower Columbia River during the month of August. Consequently, it is not advisable to use passage indices for the run-at-large to justify curtailing mitigation measures, such as spill. An analysis using only the total run-at-large may seem to indicate that the impacts of changing spill would only be imposed on a small portion of the run, whereas when specific groups of fish are considered, the impacts would be more significant. The need to protect most portions, unique life histories and genetic characteristics of the run was the foundation which led to the dates for providing spill protection that were specified in the Biological Opinion.

Moreover, summer spill is an essential element of providing improved inriver passage conditions, and it should be continued while the evaluation of juvenile fish transportation for summer migrants is being conducted. This becomes even more significant when the delayed mortality factor, i.e. the difference in mortality between transported and non-transported fish, or "D" value, is applied to the fish that are transported. The current information on "D" for subyearling fall chinook indicates that the survival of inriver fish is important to the overall survival of fall chinook.

The Council staff analysis did not evaluate the effect of adult passage past the projects in the absence of spill. Fallback estimates for adult fall Chinook from the 1998 radio telemetry indicated that a significant percentage of fish fall back throughout the system (Table 3).

Table 3. Fallback Rates of Fall Chinook in 1998 from Radio Tracking Studies by University of Idaho.

	Bonn	**TDA**	**JDA**	**MCN**	**IHR**	**LMN**	**LGS**	**LGR**
Rate	5%	10%	5%	2%	7%	2%	NA*	NA*

*Too few fish for statistical analysis

The mortality rate for fish that fall back varies greatly depending on the route of passage. Mortality through the spillway has been estimated to be approximately 2-3%, while bypass systems and turbines have much higher morality. Mortality from falling back through the turbines was particularly high with estimates of 22% and 41% for adult summer steelhead at Foster, Wagner and Ingram dams (1973). Buchanan and Moring (1986) reported a 51% mortality for adult steelhead at Foster Dam. Liscom and Stuehrenburg (1985) noted adult summer steelhead suffered a 46% turbine mortality when they were subjected to passage at Lower Monumental Dam. Mortality rates for falling back through bypass systems have not been studied extensively, but bypass systems have been shown to have much higher rates of mortality than spillways. In addition, adult salmonids have been noted with significant injuries after passing through gatewells and orifices. This is not surprising since juvenile bypass systems were not designed for adult passage. Without spill at hydropower projects the mortality rate associated with falling back will likely increase, since the remaining routes of passage have significantly higher mortality than the spillway. A comprehensive analysis to determine the impact of reduced spill should include impacts to adult salmonids, as well as the impacts to juvenile salmonids.

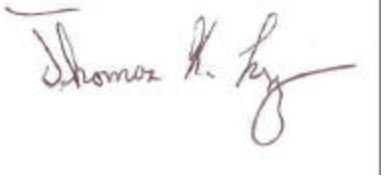
We hope that you find this information helpful when considering any potential recommendations for modifications to the Biological Opinion summer spill program. We urge the Council and staff to coordinate any proposed changes in summer spill or research needs with the region's federal, state and tribal salmon managers through the Regional Forum process. We offer to work closely with the Council and its staff on the specifics of actions that will meet the intent and performance standards of the National Marine Fisheries Service 2000 Biological Opinion, as well as the intent of the Council's Mainstem amendments to the fullest extent possible.

Sincerely,

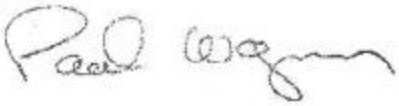
David Wills, USFWS

Steve Pettit, IDFG

Ron Boyce, ODFW



Tom Lorz, CRITFC



Paul Wagner, NMFS

Shane Scott, WDFW

Attachment F

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 N.E. Oregon, Suite 200, Portland, Oregon 97232

Telephone (503) 238-0667
Fax (503) 235-4228

July 23, 2003

Steven Wright
Regional Administrator
Bonneville Power Administration
P.O. Box 3621, R-A
Portland, Oregon 97208

RE: Summer Spill at Federal Columbia River Power System Dams

Dear Mr. Wright:

At the direction of and on behalf of the member tribes of the Columbia River Inter-Tribal Fish Commission, I am responding to Bonneville's interest in restoring tribal fisheries programs from Northwest Power Act Fish and Wildlife Program cuts and other actions in exchange for eliminating spill during August at Lower Columbia River and Ice Harbor Dams. I am pleased that Bonneville sought to consider the views of the Commission in responding to proposals from its customers and others who have requested elimination of a vital salmon protection measure. Given the present circumstances where Bonneville support of tribal and basin salmon recovery programs has been undermined by Bonneville's poor financial condition, we find the proposal to eliminate spill the second half of August to be unacceptable.

Impacted Salmon Stocks

Careful review of the proposed action indicates that the following salmon stocks would be affected by curtailing spill during the second half of August:

- Deschutes River fall chinook*
- Klickitat River fall chinook
- Yakima River fall chinook
- Mid-Columbia summer chinook*
- Priest Rapids Hatchery fall chinook
- Upper Columbia Steelhead
- Mid-Columbia fall chinook
- Umatilla River fall chinook
- Marion Drain fall chinook
- Hanford Reach fall chinook*
- Snake River fall chinook
- Snake River Steelhead

* Denotes indicator for U.S.-Canada Pacific Salmon Treaty chinook management.

We have assessed the probable impacts to the naturally spawning component of Hanford Reach fall chinook using the best information available to the Commission. The resulting increase in direct and indirect mortality would reduce returns by 16,000 to 26,000 adults for this stock alone. For Deschutes fall chinook, we expect that direct

mortality to that portion of the stock that has yet to pass The Dalles and Bonneville Dams would increase by about 12%. Other stocks originating higher in the Columbia system would be subject to greater impacts.[1]

Preliminary Smolt to Adult (SAR) data has indicated that late migrating fall chinook have a significantly higher SAR than early migrants. Thus, a small impact to this portion of the juvenile run would relate to a disproportional impact to the adult returns if the high SAR return rates for these late migrants proves out. The range of affected adults could be much larger.

In addition to impacts to juvenile salmon we have also calculated a preliminary estimate between spill and no spill on adult fall chinook and steelhead that fallback at mainstem dams. Without spill, fallback adults have in general only two routes of passage, screen systems that were not designed for adult passage and turbines. Screen passage has been shown to cause high rates of visible bruises (39% Wagner and Hilson 1991) and turbine passage has been shown to cause high rates of direct mortality (40-60% various researchers in Wagner and Hilson 1991). While spill mortality has not been directly tested, radio telemetry studies indicate that most adults that fallback through spill reascend the dam through the fishways. With a no spill condition, we estimate that about 1484 adults over that of a spill condition would be lost primarily through turbine and screen bypass passage.

At Bonneville's request, we have considered a broad range of salmon restoration actions that might be available to improve the survival of the affected stocks. These include changes in river management at other times of the year (e.g., increased spill and reduced power peaking), habitat improvement actions, increases in artificial propagation, and other actions, such as restoration of tribal law enforcement programs. Even if the tribes found such arrangements to be acceptable and they do not, it would be nearly impossible to successfully implement the broad array of actions necessary to alleviate the reductions in survival to all stocks affected by spill curtailment. Our concern is underscored by Bonneville's poor track record in providing offsets for changes in river operations for salmon that occurred in 2001. Moreover, Bonneville's current unwillingness to uphold its contractual commitments for salmon mitigation projects has resulted in litigation by the Yakama Nation against Bonneville and has compromised the effectiveness of actions by each of the tribes.

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[1] We have reviewed the NWPPC's staff presentation entitled "Fish and Energy Impacts Resulting from Reductions in Summer Bypass Spill" and we find the biological analysis contained therein to be deeply flawed. For example, the analysis treats upper Columbia fall chinook as a single stock of salmon. While far from being the case, this broad aggregation of affected populations, among other things, overlooks the indicator stocks for which U.S. and Canadian salmon fisheries are managed. *See* U.S. Canada Pacific Salmon Treaty, Annex IV, Chapter 3, Attachment I. We are troubled that the NWPPC's staff analysis is disconnected from fundamental U.S. obligations like the Pacific Salmon Treaty. Moreover, the NWPPC staff analysis failed to heed the biological advice of the fishery managers described in the joint USFWS, NMFS, IDFG, ODFW, WDFW, CRITFC, June 13 letter addressing the staff's biological analyses.

More importantly, the foregoing salmon restoration actions are needed to address existing federal hydro system impacts resulting from existing operations, even without the reductions in protection levels that would result from spill curtailment. While the tribes' fishery projects have been impacted by Bonneville defunding, Bonneville is now offering funding to restore some of these programs in exchange for eliminating a critical mainstem operation that is significant to juvenile and adult salmon survival.[2] These actions are not interchangeable - they must both be implemented if Columbia Basin salmon are to be restored to levels that will provide for sustainable, harvestable runs.

Impacts to Bonneville Finances

According to Bonneville staff, elimination of spill in the second half of August at Ice Harbor, John Day, The Dalles, and Bonneville dams would result in a financial savings to Bonneville of $15-25 million, not considering any salmon mitigation measures. Under the recently adopted Safety Net Cost Recovery Adjustment Clause (SN CRAC) rate schedule, Bonneville would use these reductions to lower the rate increase that it has projected.

Based on current projections, Bonneville will increase rates through its SN CRAC adjustment procedures about 5 percent. Notably, this rate increase is not brought about by increases in fish and wildlife costs. Bonneville's current fish and wildlife costs and its anticipated revenues (including August spill regime) were fully recognized in Bonneville's May 2001 rate decision, wherein Bonneville also retained the same base rate that it had charged since 1996. The upcoming rate increase and Bonneville's rate increases in October 2001 are largely based on Bonneville's over-subscription of the federal power system and Bonneville's failure to control its own internal costs.

The upcoming rate increase is likely to amount to about $1 per month for an average residential consumer that buys power from a utility that receives all of its electricity from Bonneville. Customers of utilities that buy only a portion of their power from Bonneville would pay less. The reductions in salmon protection that Bonneville is seeking might reduce its upcoming rate increase from 5 percent to about 4 percent, if Bonneville expends no resources on offsetting the biological impacts of eliminating spill.

While no one likes to see rate increases, Bonneville must not risk vital tribal treaty resources to avoid a 20-cent per month increase on residential electric bills. This is especially troubling since Bonneville has not measured any economic effects from the 47 percent rate increase that it imposed in October of 2001—there has been no measured reduction in demand for Bonneville's electricity supply as a result of those rate increases.

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[2] These projects are essential to fulfill the "aggressive non-breach" salmon recovery option called for by the 2000 FCRPS Biological Opinion. While on remand to NOAA Fisheries, the federal court is overseeing the efforts of the government and other parties to cure the defects in the Opinion. The court appears to clearly understand the difference between having a plan and having financial and other commitments that assure implementation of a plan. Notably, Bonneville funding of tribal law enforcement was ongoing in 2000 and was part of the FCRPS BiOp's environmental baseline.

What Bonneville's customers are seeking is a direct transfer of resources from the salmon and beneficiaries of healthy salmon runs to themselves. The tradeoffs are clear, for the benefit of Bonneville customers who have enjoyed decades of extraordinarily low cost power supplies, salmon mitigation programs would be sacrificed. [3] We believe that the Northwest Power Act was intended to cure the Northwest's insatiable demand for low cost electricity through conservation programs and a requirement that fish receive equitable treatment with the other purposes for which the Columbia River dams are operated. Are irrigation water deliveries, flood control operations, or navigation lockage being sacrificed to reduce the size of Bonneville's SN CRAC rate increase? No. Is it equitable that salmon should be sacrificed to accommodate Bonneville's over-subscription and cost control failures? No.

Unfortunately, Bonneville has already cut fish and wildlife to minimize electricity rates. Bonneville could have funded the fish and wildlife actions called for by fish and wildlife managers in the Provincial Review and kept the total rate increase to less than $3 per month for the average consumer. Instead, Bonneville decided to minimize the rate increase and is not fully funding the actions that are needed to implement the FCRPS Biological Opinions and the Columbia River Basin Fish and Wildlife Program. Based on the information described in our testimony in the SN-03 rate proceeding, we believe that a minimum of an additional $100 million per year is needed to implement these actions.[4]

Evaluation of Spill Effectiveness

The tribes have long supported spill as the best passage route for juvenile salmon.[5] Spill and flow establish vital normative conditions for juvenile and adult salmon passage and habitat in the mainstem Columbia and Snake Rivers. While the flow and spill measures called for by the 2000 FCRPS Biological Opinion are inadequate to recover salmon, they are certainly much better than no spill at all.[6]

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[3] This type of tradeoff was thoroughly reviewed and criticized in a report entitled Tribal Circumstances and Impacts of the Lower Snake River Project on the Nez Perce, Yakama, Umatilla, Warm Springs and Shoshone Bannock Tribes April 1999 Meyer Resources, Inc, http://www.critfc.org/legal/circum.htm. The report notes how the construction and operation of the Corps' FCRPS dams has resulted in a tremendous transfer of wealth from the tribes and their fishing based economies to those non-Indian economies that have flourished with the shift in the productive capacity of the river from fisheries to energy, irrigation, and navigation.

[4] For the benefit of those cc'd on this letter, the Yakama Nation and CRITFC testimony in the rate proceeding can be found at www.critfc.org. Notably Bonneville struck those portions of the tribal testimony dealing with river operations and fish and wildlife funding as being outside the scope of its rate proceedings.

[5] NOAA Fisheries and the CBFWA fishery managers have repeatedly supported spill as the best passage route for salmon survival.

[6] The tribes' 1995 anadromous fish restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Spirit of the Salmon), called for summer spill at all mainstem dams into September. Spill is critical to protect substantial portions of remaining summer chinook migrants that are ESA-listed and also those from the Hanford Reach and Mic-Columbia that support tribal, Alaska and international fisheries under the *U.S.-Canada Salmon Treaty*. There are numerous fall chinook stocks in the lower river that support tribal treaty and non-treaty fisheries.

The Council's recently adopted amendments to the mainstem sections of its Fish and Wildlife Program call for an evaluation of spill effectiveness. In our view, the critical Lower Snake River summer spill and salmon transportation test is scheduled for 2005 in the 2000 FCRPS Biological Opinion is just such a test. Study methodology for that test has been in development for over five years. In contrast, we have seen no proposed study methodology associated with the proposal to curtail August spill in 2003. Curtailing August spill in the absence of regionally acceptable study methodology will not yield useful biological information. Rather than curtailing spill in 2003, we urge Bonneville to assure that the financial resources will be available to provide for the Snake River summer spill test and maintain and expand spill at all FCRPS hydro projects to increase salmon survival.

The Commission has offered Bonneville many sound recommendations for alternatives to increase certainty for critical salmon measures.[7] Bonneville has not accepted these recommendations, and continues to propose only short-term actions, such as eliminating salmon spill and defunding tribal fisheries programs. In taking these actions, Bonneville continues to implement a policy that forces tribes to bear more and more of a disproportionate share of the conservation burden.

While salmon recovery is at the crossroads, we call on you and your agency to step up to the plate now. Bonneville must restore funding to critical tribal and non-tribal salmon recovery programs, provide certainty for spill, flow and other mainstem passage operations, and look to the future by diversifying the region's energy portfolio. Any less of an effort will surely call into question the credibility of Bonneville, and the federal government with respect to salmon recovery.

Sincerely,

Olney Patt, Jr.

Olney Patt, Jr.
Executive Director.

cc: BG William Grisoli, ACOE
Stan Speaks, BIA
Bob Lohn, NOAA Fisheries
J. William McDonald, BuRec
Judi Danielson, NWPPC
Fred Disheroon, DOJ

[7] Our rate case testimony is replete with such recommendations.

Attachment G

Adult Fallback Mortality Estimates with No Spill

	August Adults	Fallback rate	Adults fallback	Screen passage (0.5)	Turbine Pass(0.5)	Screen Mort(0.10)	Turbine Mort(0.5)	Total Mort
John Day								
chinook	37086	0						
steelhead	158933	0.0694	11030	5515	5515	552	2758	3310
TDA								
chinook	63943	0.096	6139	3070	3070	307	1535	1842
steelhead	109283	0.062	6776	3388	3388	339	1694	2033
Bonneville								
chinook	149283	0.039	5822	2911	2911	291	1456	1747
steelhead	226307	0.043	9731	4866	4866	487	2433	2920
							Total Adult Morts	**11852**

Assumptions:
Fallback rates from 2001 radio-telemetry data from U of Idaho reports for no spill periods during August or Sept-October (no spill period) if spill was provided during August 2001

August 2002 adult passage information from Corps' 2002 Annual Fish Passage Report

Chinook includes summer and fall chinook adults and jacks
Steelhead includes adult wild and hatchery

Turbine mortality from Foster Dam studies in NMFS 2000 BiOp

Screen mortality assumes that about 0.25 of fish that suffer from 41% visible injuries from Wagner and Hilson 1991 are mortalities- fish do not spawn successfully.

Attachment H

November 3, 2003

MEMO FOR: FPAC

FROM: Gary Fredricks

SUBJECT: Bonneville Operations for 2004

There are several decisions we need to make for research and operations at Bonneville in 2004. Currently, research is scheduled to investigate passage and survival through all routes of passage at the project except the powerhouse two turbines. The main questions to be addressed include passage efficiency and survival through the new corner collector, the spillway and the powerhouse one ice and trash sluiceway. Other questions include effects of spill deflector elevation on survival and effects of powerhouse two gatewell modifications on FGE.

These research objectives bring up many questions that need to be addressed by the fisheries managers, including:

1. What spill operation should we evaluate?
2. Will this be a one or two treatment test?
3. What species of test fish?
4. Should the spill pattern be adjusted to reduce potential adult passage delays?
5. What dates should the corner collector operate? With and without spill?
6. What should the powerhouse unit priorities be at both powerhouses?
7. How many second powerhouse TIE's should be removed?
8. What PH1 sluiceway gates should be operated?
9. Should spill and PH1 operation be used to minimize fallback from the Bradford Island exit?
10. Should we have separate spring and summer operations?
11. Should the STS's at powerhouse one be installed for any of the spring season?
12. What is the Spring Creek Hatchery release operation?

I'm offering the following thoughts for FPAC discussion on each question:

1. Spill Operations. There are five general potential operations that I have heard people discuss:
1) gas cap 24 hours (~140 kcfs);
2) gas cap night, new adult cap (~110-120 kcfs) day;
3) new adult day cap 24 hours;
4) gas cap night, old adult day cap (i.e. no change from BiOp); and
5) 50 kcfs spill 24 hours.

I believe 24 hour gas cap would be difficult to support due to adult passage concerns and limited juvenile benefits. The adult passage data presented at the October 27, SRWG meeting clearly show a tailrace delay of adults when spill levels go above 120 to 125 kcfs. Also, hydroacoustic data from 2002 indicate little increase in FPE for spill levels above the 110 to 120 kcfs range.

BPA's 24 hour 50 kcfs proposal would also be difficult to support because of high risk to juvenile passage including marginal spillway tailrace conditions, excessive PH1 operation and unknown corner collector efficiency and survival. This leaves the three middle options, all of which have some merit. Operating only at the current BiOp level ignores the latest radio tag data which indicates that the 75 kcfs daytime cap no longer has a basis, particularly when most of the powerhouse flow is through the second powerhouse. The gas cap night, new day cap option would provide the highest overall amount of voluntary spill while minimizing operation of PH1. The final option of a constant adult cap spill level provides some compromise to the increasing pressures of reducing spill while maintaining high spill (and fish) passage efficiency at this project. The 2002 hydroacoustic data indicate that spill efficiency and FPE both increase with increasing spill volume up to about 150 kcfs although the rate of FPE increase is low between 110 and 150 kcfs. Without more specific information on corner collector efficiency and its effect on project FPE and spill efficiency, the best recommendation seems to be gas cap night, and new adult cap of 115 kcfs during the day.

2. Test Treatments. Currently, the plan is to operate the project under one spill condition for the entire passage season. However, an evaluation that compares the base BiOp operation against a new spill operation would provide the best assessment of a new long-term operation with the corner collector. There are other reasons for a two treatment test. In several of the scenarios in #1 above, the spill varies between night and day but not from day to day. To get a better idea of how the new corner collector efficiency reacts to different spill operations, you would need operations that are different for the same daily periods, e.g., two different day operations and/or two different night operations. Including the BiOp level gives a greater range of spill levels for corner collector efficiency evaluation. The main downside of two treatments is the increased cost. Currently both the John Day and the Bonneville survival studies are above the SCT cut line, I would suggest dropping the John Day studies if a two treatment test was deemed necessary at Bonneville.

3. Test Fish. Currently, the plans are to tag steelhead, yearling and subyearling chinook. However, if another treatment group is needed the cost of the study will increase substantially. The current price tag is $5.3 million. Adding another treatment would increase the cost by about $750,000 for each species. A way to keep this cost increase lower would be to only test chinook. Our main concern with steelhead is entrance efficiency, particularly through the corner collector and sluiceway. Passage survival for steelhead typically doesn't differ that much from chinook. All of our previous studies have included chinook but not always steelhead. Even if we do not test passage of steelhead, we will be able to compare hydroacoustic passage efficiencies with chinook. If we see large differences, then steelhead could be added to tests in another year.

4. Spill Pattern. The current pattern was developed just prior to the 2002 passage season after the endbay spill deflectors were installed. We tried to minimize near shore eddies to reduce the available holding areas for predators. In doing so, we recognized that our shoreline flow velocities were quite high and may cause a problem for adult migrants. Now that we have seen that this problem seems to exist, at least at the 115+ kcfs spill levels, we may want to take a second look at the spill patterns. A flattening of the patterns at the higher spill levels may provide better adult entrance conditions. Juvenile egress conditions would be worse, but this is a

subjective assessment, the impact may not be very significant particularly at these higher spill levels.

5. Corner Collector Operation. At a minimum the collector should operate throughout the spill season and during the Spring Creek release. When designing the collector outfall we took advantage of the "push" of the spill flow to keep the collector flow in mid-channel. Without spill, a percentage of the collector flow eddies up into the spillway channel and most of the rest of the flow moves downstream too close to the Bradford Island shoreline. The Corps has recommended a spill vs. no spill summer test of the collector. I think this is too risky. If any no spill tests are to be done, they should be done outside the regular spill season. Another consideration might be fallback of adults after the spill season. For those fish that want to fallback, the sluiceway would probably provide a better route than the PH2 turbines or bypass.

6. Powerhouse unit priorities. The unit priorities are in the Fish Passage Plan, the general trend is to operate end units before middle units for adult attraction and juvenile outfall egress (PH1) reasons. Recent hydroacoustic FGE data (Ploskey et. al 2002) has indicated that FGE is much better for middle units at powerhouse two. It should be noted however that changing powerhouse unit operations might have a negative effect on the corner collector efficiency (as well as on adult passage). Also, we really don't know how the horizontal distribution of fish or FGE might change with the corner collector operating. I suggest we leave this one alone for the year at PH2. PH1 priority depends on what we do with JBS operation (#11 below).

7. Powerhouse two TIE's. The turbine intake extensions were put in place to counteract the tendency for the forebay flow to eddy to the south (and north). This eddying action was thought to be a cause of poor FGE at this powerhouse and they were proven effective at increasing FGE, at least for the spring passage season. However, this eddying action is also what causes fish to pass near the corner collector entrance. Currently, the plan is to remove TIE's from units 11 through 14 in the spring (all TIE's are currently removed in the summer). There was some discussion at the October 27 SRWG meeting about possibly removing additional TIE's. The benefit of removing these from more northerly units may have some beneficial effect on the corner collector efficiency due to the way flow moves into this forebay. This action would however, have the tendency to reduce FGE in the units which tend to have higher FGE in the first place. I suggest we stick with the original plan unless some model work shows a clear potential to improve forebay hydraulics in a way we think is conducive to sluiceway guidance. We should suggest that the Corps investigate this with the ERDC forebay model before any changes are made.

8. Powerhouse One Sluiceway Operation. Currently, chain gates 10C and 7A are open during the passage season. Hydroacoustic data (Ploskey et al, 2002, pers. com. 2003) indicated that there is little passage into chain gate 10C and very high passage through 7A. I recommend we ask the Corps for a complete hydraulic evaluation of the sluiceway, similar to the analysis done for The Dalles Dam sluiceway. This will tell us the hydraulic consequence of opening different gates. Combining this with horizontal and vertical fish distribution data for the forebay should identify an appropriate gate to open in place of 10C. Ploskey (2002) recommends a gate open at unit 5 or 6 and perhaps at unit 2 depending on hydraulic capacity of the sluiceway. Kelt passage

may be best at unit 1 or 2 according to kelt passage information (Wertheimer pers. com).

9. Minimizing Powerhouse one operation. It is clear for juvenile and adult studies that powerhouse one operation should be minimized for best fish passage and survival. Adult studies have shown that adult fallback increases as PH1 operation increases. Fallback seems to increase when PH1 flow approaches 50-60 kcfs (Clugston pers. com, but he indicated we need to check further on this). Juvenile R/T data from 2002 indicates that overall PH1 survival is 8 to 10% lower than survival through either the spillway or PH2 (Counihan et al. 2003). The capacities (in kcfs) of the various major flow routes at this project are; PH1 = 100, PH2 = 140, TDG cap spill ~ 140, old adult spill cap = 75, and new adult spill cap = 110-120. Hydraulic capacity of the project without PH1 is 250 with a 110 kcfs spill cap to 290 kcfs with a 140 kcfs spill cap.

10. Separate Spring and Summer Ops. This is really a John Day vs. Bonneville dam decision since BPA has said that if we change John Day Dam summer spill to 30% 24 hours, their transmission limitations would not allow a change for more day spill at Bonneville Dam. They say summer operations between these projects must remain megawatt neutral until transmission line changes are made. Given this, a 30/30 operation at John Day means BiOp operation at Bonneville Dam. It appears we need to decide which is more important for overall subyearling survival, 30%, 24 hour spill at John Day or higher day spill at Bonneville Dam. I am still working on this one. Regarding spring operations; BPA indicated there is no limitation on Bonneville spring spill from a power transmission perspective (and given there is no proposal to change daytime operations at John Day).

11. Powerhouse One STS's. The Corps is recommending that the powerhouse one screens and JBS not be used during the spring. These screens are currently in during the spring and removed during the summer. The reason for this recommendation is the poor JBS survival noted in 2002 survival study. That spring chinook R/T study (Counihan et al. Draft 2002 report) indicated a 91% (+/-8) survival for the PH1 JBS and a 101% (+/-3) survival for the MGR turbines. These treatment groups had a common control group released below the PH2 JBS outfall. The MGR units include unit 1 and 3-6 (five of the ten units). While we might not like the absolute values of these estimates or the wide confidence interval for the JBS estimate, the fact remains that they should be comparable in a relative sense and bypass survival appears to be worse than turbine survival. Another consideration is that sluiceway passage of juveniles is high at this powerhouse. The 2002 hydroacoustic estimates indicate that 33% of all spring migrants passing PH1 pass the sluiceway. Since PH1 FPE was 58%, subtracting the sluiceway efficiency indicates the bypass was passing only about 25% of the powerhouse passage. A final consideration is adult fallback, however this has been low through either powerhouse at this project.

12. Spring Creek Hatchery Release. Defer to Dave Wills.

Attachment I

March 26, 2004

Judi Danielson, Chair
Northwest Power and Conservation Council
851 SW 6th Ave., Suite 1100
Portland, OR 97204-1348

Dear Judi:

The Columbia Basin Fish and Wildlife Authority (CBFWA) would like your support and assistance in encouraging Bonneville Power Administration (BPA) to fully fund the Northwest Power and Conservation Council's (Council) Fish and Wildlife Program (Program) budgets for Fiscal Year (FY) 2004 through 2006. By our calculations, BPA needs to replace approximately $10-15 million in FY 2004 of the $81 million cut in FY 2003 in order to accomplish this purpose.

As you are aware, the Fish and Wildlife Program is one of very few programs within BPA that has been historically under budget. Although we support program cuts BPA has sought throughout their agency to improve cost efficiency and meet the demands of the current rate agreement, nowhere within BPA have the funding cuts been as severe as within the Fish and Wildlife Program (Program). In the past year BPA has taken the following actions to reduce funding for the Program:

- Cut over $40 million from the Program by eliminating carry-over funding from previous years.
- Cut $11 million in Program funding by changing from an Obligations based planning budget to an Accruals based planning budget.
- Cut nearly $30 million by imposing a strict interpretation of a Capital funding policy. Although BPA argues that $36 million in borrowing authority is available each year for fish and wildlife projects, the application of their stringent funding criteria resulted in only $6.8 million of fish and wildlife related capital projects actually being funded.

As the Council and fish and wildlife managers work to absorb these tremendous reductions to the Program, BPA is now proposing to cut an additional $15 million from the Program budgets. This current Program reduction is a direct result of BPA's fiscal management processes and inconsistent accounting rules. In effect, BPA paid for FY 2002 and earlier obligations with FY 2003 funds.

In FY 2003, when Steve Wright asked the Council to balance the Program budget to an average of $139 million annually for the remainder of the rate case, the Council abided this request and cut over $40 million from the FY 2003 Program. Later in the fiscal year the Council reviewed the actual expenditures and identified approximately $15 million of FY 2003 savings that could be used to support deferred tasks in FY 2004. This action supported the Council budget of $154 million in FY 2004, but retained the $139 million average as requested by Mr. Wright. However, at the close of FY 2003, BPA identified approximately $10 million of FY 2002 and previous work that they insisted must be paid from the existing allocated FY 2003 budget. These are

invoices for work that had been billed to BPA prior to the Council budget exercise, but not included in the supporting material when the Council allocated the FY 2003 budget. In addition, another $3-5 million worth of capital projects were funded within the $139 million in FY 2003 as well as projects BPA funded without regional review and approval. These categories of projects were not identified by BPA as a potential impact to the Council's budget balancing effort until it was too late for the Council to manage.

The continued demands on the Program funding are placing the fish and wildlife protection, enhancement, and restoration efforts in the Columbia River Basin in significant jeopardy. The decrease in funding and the significant increase in the process necessary to manage the reductions have seriously compromised project implementation. In addition, continued reduction in fish and wildlife funding will certainly compromise the relationships with local stakeholders that have been fostered over the past two years as the Council concludes its subbasin planning effort.

The Members of the Columbia Basin Fish and Wildlife Authority request your assistance in encouraging BPA to keep the Council's FY 2004 budget whole in FY 2004 and to maintain the $139 million funding level in FY 2005 and FY 2006 through whatever means are available and appropriate to fully support the Council's original rolling province review recommendations.

Sincerely,

Warren Seyler, Chair
Columbia Basin Fish and Wildlife Authority

cc: Council
Governors
Steve Wright and Therese Lamb, BPA
Members
MMG
PPC
Northwest Irrigation Utilities
Pacific Northwest Generating Cooperative
Pacific Northwest Utilities Conference Committee

Attachment J

UMATILLA INDIAN RESERVATION • SHOSHONE-BANNOCK TRIBES • WASHINGTON FISH & WILDLIFE • SALISH KOOTENAI TRIBES • NATIONAL MARINE FISHERIES SERVICE • YAKAMA INDIAN NATION • IDAHO FISH & GAME • WARM SPRINGS RESERVATION • BURNS-PAIUTE • KOOTENAI TRIBE • SPOKANE TRIBE • MONTANA FISH, WILDLIFE & PARKS • COLVILLE RESERVATION • OREGON FISH & WILDLIFE • NEZ PERCE TRIBE • KALISPEL TRIBE • U.S. FISH & WILDLIFE • SHOSHONE-PAIUTE TRIBE • COEUR D' ALENE TRIBE

COLUMBIA BASIN FISH & WILDLIFE AUTHORITY

March 25, 2004

TO: MMG

FROM: CBFWA staff

SUBJECT: Comments on BPA Response to Biological Opinion Check-in comments

Attached is the March 23rd response from the Bonneville Power Administration (BPA) to the letter from Columbia Basin Fish and Wildlife Authority (CBFWA) to the Action Agencies (dated February 3, 2004), which raised concerns about the level of actual funding for implementation of the NOAA Fisheries 2000 Biological Opinion. In the Action Agencies 2003 BiOp Check-in Report, BPA reported that they were spending nearly $175 million for BiOp implementation ($139M in Expense plus $36M in Capital) in the Integrated Program. The CBFWA letter noted that spending in FY 2002 and FY 2003 was actually significantly less (approximately $60 million).

The March 23, 2004 response by BPA confirmed our contention that reporting on BiOp spending had been significantly over-stated. BPA reports that actual spending on actions for the BiOp over the past three years has averaged less than $90 million per year (little more than 50% of the figure reported in the 2003 Check-In Report). Although we still have concerns on some of the details, the numbers reported by BPA in their response are consistent with our most recent updated calculations as generated by the development of the 2004 CBFWA Annual Report. We are confident that the overall spending reported by BPA is within 5-10% of our current estimates; however, we are pursuing access to BPA's BiOp data to fully understand their calculations. The final BiOp numbers will be verified and included in the final 2004 CBFWA Annual Report.

The question still remains, however, as to why BPA continues to include the full cost of their overhead as BiOp implementation. They have now confirmed that only approximately 65% of their funding in the Integrated Program is for BiOp implementation (total actual spending in FY 2002 and FY 2003 has been about $145 million per year), yet they claim 100% of their overhead in that category. It is also disappointing that BPA failed to acknowledge our contention that their earlier cost figures were substantially over-stated ($90M actual versus $175M reported).

In summary it appears that the CBFWA letter achieved its objective of getting BPA to provide more accurate Fish and Wildlife Program costs; however, it appears that BPA is still resisting full accountability of their actual BiOp expenditures.

H:\work\consent\BiOpCheckinActionAgencies\BPAActionAgenciesResponseMemo.doc

2501 SW First Avenue, Suite 200
Portland, Oregon 97201
503/229-0191 Fax 229-0443
www.cbfwf.org

Attachment K

UMATILLA INDIAN RESERVATION • SHOSHONE-BANNOCK TRIBES • WASHINGTON FISH & WILDLIFE • SALISH KOOTENAI TRIBES • NATIONAL MARINE FISHERIES SERVICE • YAKAMA INDIAN NATION • IDAHO FISH & GAME • WARM SPRINGS RESERVATION • BURNS-PAIUTE • KOOTENAI TRIBE • SPOKANE TRIBE • MONTANA FISH, WILDLIFE & PARKS • COLVILLE RESERVATION • OREGON FISH & WILDLIFE • NEZ PERCE TRIBE • KALISPEL TRIBE • U.S. FISH & WILDLIFE • SHOSHONE-PAIUTE TRIBE • COEUR D' ALENE TRIBE

COLUMBIA BASIN FISH & WILDLIFE AUTHORITY

February 3, 2004

Stephen J. Wright
Administrator & CEO
Bonneville Power Administration - MG
905 NE 11th Ave.
Portland, OR 97208-3621

Brigadier General William Grisoli
U.S. Army Corps of Engineers
Northwestern Division
P.O. Box 2870
Portland, OR 97208

J. William McDonald
Regional Director
U.S. Bureau of Reclamation
1150 N. Curtis Road, Suite 100
Boise, ID 83706-1234

Dear Sirs,

The fish and wildlife managers of the Columbia River Basin provide the following comments on the "ESA 2003 Check-In Report for the Federal Columbia River Power System." Our comments are based on the Columbia Basin Fish and Wildlife Authority (CBFWA) analysis of the Bonneville Power Administration's (BPA) annual funding for projects addressing RPA action items in the Fish and Wildlife Program since the adoption of the 2000 FCRPS Biological Opinion (BiOp). We believe that the BPA has significantly over-estimated its actual financial contribution to the Action Agencies' efforts towards habitat restoration and offsite actions.

In the Check-In report, the Action Agencies state that:

> **"2003 Check-In for the Federal Columbia River Power System (Report 1-3)**
> **3.3 BPA Funding for Hydro and Offsite Actions**
> When the MOA expired and the Integrated Program began in December 2001, BPA began spending an average of $139 million annually in expenses and made $36 million available for capital expenditures on direct fish and wildlife activities or projects. The 39 percent increase in expense in this category above the MOA period ($100 million) was intended primarily to implement offsite BiOp actions above and beyond those already being implemented under the Council's Fish and Wildlife Program when the BiOp was issued. "

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Portland, Oregon 97201
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www.cbfwf.org

Our analysis indicates that BPA has funded RPA actions totaling $57.7 million in Expense and $1.4 million in Capital in 2002 and $59.6 million in Expense and $3.4 million in Capital in 2003. These are projects identified by the NOAA Fisheries during the Rolling Province Review as being consistent with the BiOp. We should note until only recently BPA has been unable to make actual project specific expenditures available.

Based on our analysis, the Action Agencies reporting of expenditures in the Expense category of the Fish and Wildlife Program is not supported by the financial data. The report states that an additional $39 million annually (39% of $100 million) "was intended primarily to implement offsite BiOp actions above and beyond those already being implemented under the Council's Fish and Wildlife Program when the BiOp was issued." Our analysis of actual FY 2003 expenditures in the Expense category reveals that only $19.7 million consisted of projects initiated between FY 2001 and FY 2003 (new actions since the BiOp was adopted), and only $8.3 million of those projects addressed RPA actions as identified by the NOAA Fisheries. In FY 2002, only $6 million of all projects funded were for projects initiated in FY 2001 or FY 2002, with less than $3 million of those projects addressing RPA actions.

The apparent discrepancy between the level of Capital spending reported and actual expenditures is another significant concern. In FY 2002 the BPA expended less than $8 million (out of $36 million available) on projects that met its Capital definition for the entire Fish and Wildlife Program with only $1.4 million in projects that addressed RPA actions in the BiOp. Again in FY 2003 the BPA expended less than $12 million (out of $36 million available) on projects that met its definition of Capital in the Fish and Wildlife Program, with only $3.4 million in projects addressing RPA actions in the FCRPS BiOp. No new BiOp capital projects were initiated in either FY 2001 or FY 2003.

Clearly, a significant effort to implement additional actions in response to the 2000 BiOp has not been undertaken. Any evaluation of off-site actions funded by the BPA at this point is based on projects that were already in place prior to the release of the 2000 BiOp. While an argument that these ongoing projects have been modified to address current BiOp needs can be made, all ongoing projects have been level funded for the past three years based on the Council's Rolling Province Review recommendations as driven by BPA's recent decision to cap fish and wildlife funding. It should be noted that additional new projects that met the NOAA Fisheries criteria as BiOp actions were available for funding during this time. This also demonstrates the difficulty in meeting BPA's diverse obligations by funding their BiOp efforts wholly within the existing Fish and Wildlife Program.

Using this analysis as an indicator, the CBFWA Members are concerned that the Action Agencies are significantly overstating the current accomplishments under the FCRPS Biological Opinion(s). We believe this analysis reveals a lack of urgency in addressing the offsite mitigation required to meet the intent of the 2000 NOAA Biological Opinion to protect and restore listed salmon in the Columbia River Basin.

Our two Members representing Federal regulatory agencies on the Columbia River, the NOAA Fisheries and U.S. Fish and Wildlife Service, have abstained from participation in the development and approval of these comments.

Sincerely,

Warren Seyler, STI, Chair
Columbia Basin Fish & Wildlife Authority

cc: Therese Lamb, BPA
Council Members
CBFWA Members

Attachment L

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
729 NE Oregon, Suite 200, Portland, Oregon 97232 Telephone 503 238 0667
Fax 503 235 4228

Memorandum

Date: December 12, 2003
To: Jim Ruff, NOAA Fisheries; Witt Anderson, Corps of Engineers
From: Tom Lorz and Bob Heinith, CRITFC

Subject: **Comments and Recommendations on Ice Harbor 2004 Operations and Removable Spillway Weir.**

- The Region first needs to be assured that there really is a problem with spillway survival at Ice Harbor. It is uncertain whether the current fish survival results are an artifact of the study design or execution, such as release mechanism or other fish handling procedures. We are unaware of any completed review comparing reach survival data with project specific data for Ice Harbor. If a spillway survival problem exists, we should be able to detect it in the reach survival data.

- Nevertheless, if it is assumed that the measured spillway survival values are due to a mechanism involving the dam and not an artifact of the study itself, there still needs to be a better understand of what is causing the mortality. Several hypotheses have been tested and discarded. In 2003, a bulk spill strategy was tested. Preliminary study information indicates that survival improved to the ~96% level with ~98.5% FPE. We need to verify these results for spring conditions. If these levels of survival continue to be observed during the 2004 spring migration and can be reliably considered as baseline data, the question becomes what survival improvements can be achieved by the removable spillway weir (RSW). It is unlikely that the RSW will increase FPE. And, since we are not sure what is the cause of the mortality if it exists, just placing an RSW at IHR cannot be relied upon to improve survival past the 96% level.

- The current hypothesis for the lower than expected spillway survival at Ice Harbor relates to nape depth at the spillway ogee and interactions with the deflector. The RSW by itself will likely not address this issue. Bulk spill has greater nape depth than the current BiOp spill and thus may explain the increase in survival witnessed in 2003. However, ranges of flows through the RSW will be less than bulk spill and the water through the RSW will be released in an overflow style, which will likely generate a nape depth less than bulk spill. This configuration needs to be verified. If nape depth on the RSW is less than the bulk spill, we are creating a situation that moves away from an operation known to increase spillway survival. This gets back to CRITFC's assessment that a better understanding of the mortality mechanism is critical to insure whatever changes we make

are likely to improve survival. Regional research discussions indicate that an additional year of study to better understand the mechanism and then design and/or fix the problem should be contemplated. CRITFC recommends a more cautious approach to insure the best structure is designed and installed to assure that direct survival through the structure and over the spillway is equivalent or better as bulk spill. In addition, a comparative test for indirect mortality should be designed and tested.

- The bulk spill test is a crude surrogate for an RSW operation and it seems prudent to test this concept for the spring migrants to insure the survival benefits witnessed in summer 2003 translate to the spring fish. If the benefits of bulk spill continue with fish survival at a relatively high rate, it does not seem to us reasonable for the region to continue consideration of an RSW at Ice Harbor or other dams until we complete comprehensive fish impact testing of the Lower Granite RSW. We question what survival benefits the proposed Ice Harbor RSW would provide the region and whether the region should consider RSWs at other projects.

- A great deal of regional technical discussion has taken place describing the benefits of the Lower Granite RSW and while preliminary information looks promising we are still cautious. We only have two years of guidance information and one year of survival information. The one year of survival data was not statistically different than BiOp spill, but the trend indicated an improvement. The RSW needs to be fully tested for summer migrants.

- Of the Snake River projects, Ice Harbor is the most unique. The spillway deflectors at Ice Harbor are much higher than Lower Granite, and the tailrace is much shallower than Lower Granite. Both of these conditions may play a critical role in understanding the spillway survival issues we are trying to address at Ice Harbor. An RSW will not correct either of these conditions. The RSW testing at Lower Granite continues to make sense since the objective there is to increase FPE by increasing SPE. However, the RSW at Ice Harbor will likely not improve FPE over current conditions. Instead, installing a RSW is an attempt to improve spillway survival over the existing condition and CRITFC remains uncertain how the RSW will accomplish that.

- By continuing with the fast track of the Ice Harbor RSW the region will be committing at least $7 million of 2005 budget, possibly more depending on study requirements. This is a large commitment of extremely limited CRFMP funds when other critical needs that the tribes have long advocated for, such as temperature improvements at passage facilities, and lamprey research and passage facilities have suffered from lack of funding.

- If the RSW is built and installed, any additional needed improvements in Snake River juvenile survivals (e.g. SARs for spring chinook and sockeye) will need to be seriously considered and may be limited by the operation of the RSW. Further, if the spillway deflectors need to be lowered, it is unclear what would be the impact to total dissolved gas production.

- The spillway at Ice Harbor is integral to improving project juvenile fish survival. Direct turbine survival for sub-yearlings is estimated at ~88%, and the survival through the whole bypass system from forebay to gatewell to outfall remains uncertain. Screen guidance is in the 50-60% for sub-yearlings. Therefore the spillway remains a critical passage route at Ice Harbor. Rushing into RSW installation at Ice Harbor before the fish mortality mechanism is clearly identified and understood could confound our ability to focus resources to the specific problem at hand while increasing the time it takes to modify the spillway to improve survival and recovery of listed stocks. A relative survival study comparing bulk spill, screen bypass and turbine passage would establish an important baseline for consideration of RSW installation or other passage solutions.

Attachment M

ATNI Resolution #04-007

2004 Winter Conference
Portland, Oregon
RESOLUTION #04 -007

"OPPOSING THE ELIMINATION OR REDUCTION OF THE SUMMER SPILL PROGRAM THAT BENEFITS MIGRATING SALMON AND OTHER ANADROMOUS FISH IN THE COLUMBIA AND SNAKE RIVERS"

PREAMBLE

We, the members of the Affiliated Tribes of Northwest Indians of the United States, invoking the divine blessing of the Creator upon our efforts and purposes, in order to preserve for ourselves and our descendants rights secured under Indian Treaties and benefits to which we are entitled under the laws and constitution of the United States and several states, to enlighten the public toward a better understanding of the Indian people, to preserve Indian cultural values, and otherwise promote the welfare of the Indian people, do hereby establish and submit the following resolution:

WHEREAS, the Affiliated Tribes of Northwest Indians (ATNI) are representatives of and advocates for national, regional, and specific Tribal concerns; and

WHEREAS, the Affiliated Tribes of Northwest Indians is a regional organization comprised of American Indians in the states of Washington, Idaho, Oregon, Montana, Nevada, Northern California, and Alaska; and

WHEREAS, the health, safety, welfare, education, economic and employment opportunity, and preservation of cultural and natural resources are primary goals and objectives of Affiliated Tribes of Northwest Indians; and

WHEREAS, since time immemorial, our economy, culture, religion and way of life have been centered around our fishing, hunting and gathering resources, and the lands and waters on which they depend, and yet their health and well-being have suffered greatly as a result of many harmful non-Indian activities and actions; and

WHEREAS, the loss and diminishment of many of these resources has in turn caused substantial harm to tribal people and communities and has impacted our inherent tribal sovereignty, which is based in part on the free exercise of our rights to fish, hunt and gather, and the United States has a duty, based on treaties, executive orders, the federal trust responsibility and numerous court opinions, to ensure that those rights are honored; and

WHEREAS, among the many resources that have been destroyed and degraded by the development and operation of the Columbia River hydropower system are various populations of salmon, lamprey, sturgeon, resident fish and wildlife, to such an extent that numerous such species have gone extinct or are currently listed under the federal Endangered Species Act (ESA); and

WHEREAS, the U.S. Army Corps of Engineers (USACE) and the Bonneville Power Administration (BPA) have legal obligations, under the National Historic Preservation Act and other statutes, to identify and protect archaeological and cultural resource areas impacted by the operation of the Federal Columbia River Power

System through identification, enforcement and education, particularly in light of the Lewis and Clark memorial events; and

WHEREAS, one of the primary specific factors in the loss and diminishment of fish populations has been the construction and operation of the federal hydrosystem in the Columbia Basin, which harms fish basin-wide by detrimentally altering their essential riverine habitat and by killing, injuring and disorienting those that pass through either dam turbines or extended-length screen systems; and

WHEREAS, in addition to directly and indirectly harming migrating fish populations, the federal hydrosystem has created reservoirs and affected riverine systems in the upper portion of the Columbia River Basin that have frequently been managed in ways that negatively impact many treaty and trust resources, including cultural and natural resources in both rivers and reservoirs; and

WHEREAS, the safest means of fish passage around dams is by controlled spill, a point on which there is virtually unanimous scientific agreement (including that of NOAA Fisheries); and

WHEREAS, four Columbia River treaty tribes fought hard for more than two decades to finally succeed in securing the summer spill program to protect outmigrating salmon and to improve survival and reproduction of lamprey and sturgeon; and

WHEREAS, additional political entities and other organizations, such as the State of Alaska and the Alaska Trollers Association, are concerned about healthy fish populations and habitat and the many benefits they provide, and, as such, are in substantial agreement with the tribal position in support of the continuation of the summer spill program; and

WHEREAS, federal agencies, led by BPA, have been engaged in a vague, unwritten yet aggressive campaign to eliminate spill during the summer based on claims that it is unjustifiably "expensive," again inequitably blaming fish recovery measures for so-called "foregone revenues" lost while consistently failing to note or address revenues foregone from water devoted to irrigation, navigation and other non-Indian economic activities; and

WHEREAS, the United States District Court for the District of Oregon has ruled that the FCRPS Biological Opinion—even with its provision for summer spill—nevertheless violates the ESA and fails to ensure adequate protection for ESA-listed fish, and BPA's proposal to curtail summer spill is therefore a step in the wrong direction, providing even less protection than that of a federal recovery plan already deemed legally insufficient; and

WHEREAS, eliminating or significantly reducing summer spill in 2004 will result in the loss of tens of thousands of fish (adult equivalents), which includes about 15% of the returning fall chinook, thus impacting tribal ocean and Columbia River fisheries, and BPA and the other federal agencies have yet to accurately and specifically determine or describe how to mitigate for this loss of salmon, lamprey and sturgeon; and

WHEREAS, the Deschutes fall chinook are an indicator stock under the Pacific Salmon Treaty and will be substantially impacted such that ocean fisheries management will be significantly affected; and

WHEREAS, the late portion of the juvenile summer salmon run through the lower Columbia River dams contributes most of the larger and older adults to harvest and to the spawning grounds, thereby ensuring stock resiliency in the face of poor environmental conditions such that curtailing summer spill would select against important stock life history diversity, and thus there are serious doubts about whether it is even possible to mitigate for curtailing summer spill; and

WHEREAS, BPA appears to be proposing, or has expressed support for, certain measures that it has already adopted or supported in the past, as so-called "offsets" for curtailing spill, thus effectively "double counting" its claimed commitments to fish and wildlife recovery; and

WHEREAS, BPA now offers to support the "Vernita Bar plus" operations as a spill "offset" if summer spill is reduced, even though BPA was supporting these operations before it proposed reducing summer spill; and

WHEREAS, it is not necessary to draw water from the upper reaches of the Columbia River Basin in order to implement the summer spill program, and

WHEREAS, the Columbia River tribes support implementation of a natural flow regime, including a lesser, stable rate and level of reservoir drawdown for the entire Columbia River Basin including Libby, Hungry Horse, and Grand Coulee reservoirs; and

WHEREAS, BPA similarly appears to be willing to continue to fund certain tribal law enforcement activities if tribes agree to reduce spill or, at a minimum, agree to negotiate possible reductions, even though BPA is already obligated, and has committed, to adequately fund tribal law enforcement that benefits fish and wildlife populations; and

WHEREAS, BPA's claimed "offsets" do not come close to providing the same in-kind benefits as spill, they remain vague and unspecified as to where they will occur, when they will occur, what benefits they will provide, and when those benefits will accrue; and

WHEREAS, among the "offsets" that BPA has suggested is to further reduce tribal fisheries harvest to "mitigate" for the fish that will be killed by curtailing summer spill, a proposal which the tribes find insulting, outrageous, unjust, and unacceptable; and

WHEREAS, BPA has in the past failed to honor it commitments to "offsets" to mitigate for its actions that have killed fish, as was the case during BPA's alleged financial "crisis" in 2001, when summer spill was reduced at BPA's instigation and $25 million in "offsets" were identified, an amount that grossly underestimated that which was necessary to fully and properly mitigate for halting spill that year, and BPA then compounded this travesty by spending only about half of this amount, calling into serious question BPA's integrity and willingness to honestly fulfill any promises regarding "offsets" or mitigation; and

WHEREAS, ATNI Resolution #03-31, dated February 13, 2003, supported the transfer of implementing authority and contracting functions of the Fish and Wildlife Program from BPA to another entity based on an obvious conflict of interest, which is clearly demonstrated by BPA's current efforts to undermine and undercut the Program in order to increase it revenues from the sale of power; and

WHEREAS, BPA's financial health appears to have substantially improved compared to what BPA has asserted in the past, and thus the primary motivation for its zeal to curtail summer spill this year appears to be greed and the desire to maximize its power revenues at the expense of fish and other resources in which the tribes retain sacred rights and interests; and

WHEREAS, the loss of thousands of salmon will inevitably lead to the further erosion of tribal fishing rights and the ability to freely exercise them; now

THEREFORE BE IT RESOLVED, that the Affiliated Tribes of Northwest Indians supports implementation of the summer spill program to pass anadromous fish, including but not limited to controlled spill at Bonneville, The Dalles, John Day, and Ice Harbor dams; and

BE IT FURTHER RESOLVED, that BPA, U.S. Bureau of Reclamation (BOR) and USACE must address their failure to meet their obligations under the National Historic Preservation Act by providing adequate funds to protect archaeological and cultural resource areas from looting, erosion and human impacts including surveys, law enforcement and public education; and

BE IT FINALLY RESOLVED, that the Affiliated Tribes of Northwest Indians supports management of the upper Basin reservoirs and rivers so as to avoid harmful impacts to treaty and trust resources, including cultural and natural resources, and that BPA, BOR and USACE manage the Federal Columbia River Power System to implement the summer spill program while not impacting in any way upper Basin reservoir levels and river flows that support those treaty and trust resources especially in light of the BPA's erroneous "lost revenue" arguments that call for more water out of upper reservoirs if the summer spill program is maintained.

CERTIFICATION

The foregoing resolution was adopted at the 2004 Winter Conference of the Affiliated Tribes of Northwest Indians, held at the Embassy Suites Hotel Portland Airport in Portland, Oregon on February 12, 2004 with a quorum present.