

**Findings Regarding Adequacy
of the Federal Columbia River Power System
Action Agencies'
2004 Annual Implementation Plan**

**NOAA Fisheries
Northwest Region**

July 1, 2004

1.0 Introduction and Background

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) issued a biological opinion addressing operation of the Federal Columbia River Power System (FCRPS) and 19 U.S. Bureau of Reclamation (USBR) projects on December 21, 2000 (hereinafter, "the Opinion"). This consultation was conducted with the U.S. Army Corps of Engineers (Corps), the Bonneville Power Administration (BPA), and the USBR, collectively referred to as the FCRPS Action Agencies. A May 7, 2003, Opinion and Order by the United States District Court for the State of Oregon remanded the 2000 FCRPS Biological Opinion back to NOAA Fisheries to correct deficiencies in the definition of the action area, to ensure that only Federal actions that had undergone Section 7 consultation were considered in the environmental baseline, and to ensure that only non-Federal actions that are reasonably certain to occur were considered in the cumulative effects. The Court left the Opinion in place during the period of the remand.

The Opinion defines a reasonable and prudent alternative (RPA) consisting of 199 Actions which are intended to improve survival and the likelihood of recovery for listed salmon and steelhead evolutionarily significant units (ESUs) in the Columbia River Basin. The RPA consists of one suite of Actions that defines hydro improvements within the FCRPS. Another suite of Actions specifies offsite mitigation in the form of improvements to tributary, mainstem, and estuary habitat; improvements in operation of hatcheries and development of an artificial propagation safety-net program; development of more selective fishing techniques to reduce harvest impacts on listed ESUs and other harvest management improvements; and development of a research, monitoring, and evaluation (RM&E) program. Each of the Action Agencies issued records of their decisions to incorporate this RPA into their operations for the FCRPS.

The Opinion anticipated that many of the RPA Actions would need to be refined and adjusted as new study results and other relevant information became available. The RPA defined a rolling annual and five-year planning process to implement the RPA. The FCRPS Action Agencies produce annual and five-year implementation plans (IP) that describe progress to date, lay out details of the short- and long-term plans for achieving performance standards, propose adjustments to the RPA Actions, and describe the rationale for those adjustments. The RPA also defined comprehensive midpoint implementation progress evaluations in 2003, 2005, and 2008. At these midpoint evaluations, implementation progress is compared with procedural performance standards in all three years and with biological performance standards in 2005 and 2008.

As a procedure called for by the RPA, NOAA Fisheries is expected to review each year's annual IP. NOAA Fisheries must issue a Findings Report to the FCRPS Action Agencies addressing consistency of the proposed annual plan with the RPA and, if appropriate, recommend needed changes. To the extent that the annual and five-year IPs propose changes in the schedule or scope of RPA Actions, NOAA Fisheries is expected to explicitly determine in writing whether

all such amendments are consistent with the expectations of the Opinion and the RPA. NOAA Fisheries previously issued Findings Reports on the FCRPS Action Agencies' 2002 and 2003 IPs. These reports determined that the Action Agencies' 2002 and 2003 IPs were generally consistent with the Opinion and were likely to meet procedural performance standards at the 2003 midpoint implementation progress evaluation. However, the Findings Reports identified several specific RPA Actions that "required resolution," generally because of delayed schedule or reduced scope. The 2003 Findings Report identified RPA Actions 31, 36, 136, 154, 174, 183, and 198 as requiring resolution. The 2003 Findings Report also identified several other RPA Actions as being implemented as expected, contingent upon successful initiation of the "critical projects" listed in the February 12, 2003, letter from NOAA Fisheries and BPA to the Northwest Power and Conservation Council (Council).

In November 2003, the Action Agencies released a 2004/2004-2008 IP. NOAA Fisheries delayed preparing a Findings Report on the IP until completion of the 2003 Implementation Progress Evaluation Report.

On December 23, 2003, NOAA Fisheries issued a 2003 Implementation Progress Evaluation Report that evaluated the cumulative implementation of the Opinion's RPA through 2003. This report determined that, on balance, cumulative implementation of the RPA was not meeting expectations, but was capable of timely resolution within current authority (i.e., a "yellow zone" determination per Section 9.5.2.2 of the Opinion). The primary reason for NOAA Fisheries' determination that expectations were not being met was the delay of 1) key actions that represent preparations for implementation of additional survival improvement measures; and 2) key planning, research, and monitoring actions that are important for implementation and evaluation of progress by 2005 and 2008. NOAA Fisheries noted that the delays could not be remedied at this point, and that current deadlines and milestones, as noted in the Action Agencies' IPs, represented a more realistic schedule and should be adhered to.

NOAA Fisheries' 2003 Implementation Progress Evaluation Report also included five recommendations to ensure that the Action Agencies' implementation of the Opinion would be capable of timely resolution within current authority. The recommendations were:

1. BPA should continue to work with the Council to assure completion and updating of subbasin assessments and plans. As stated in Question 5, NOAA Fisheries encourages the establishment of a credible "fix-it" loop for the subbasin plans in response to technical review between May 2004 and December 2004. This would also allow inclusion and integration of input from Technical Recovery Team products. NOAA Fisheries also recommends the support and development of a coherent implementation framework for subbasin plans. NOAA Fisheries intends to incorporate subbasin plans into ESU-wide recovery plans and into provincial strategies. This will allow project priorities for the Council's provincial review process to be coordinated and implemented in a unified manner.

2. Similarly, a multi-agency implementation plan should be developed for ESA-related reforms identified in approved Hatchery and Genetic Management Plans. NOAA Fisheries recommends that the Action Agencies plan to implement an appropriate portion of the identified reforms.
3. NOAA Fisheries recommends that the Action Agencies summarize the performance of their off-site initiatives, such as water transactions, conservation easements, and riparian protection, in the annual progress reports.
4. In the area of RM&E, NOAA Fisheries is aware that three pilot projects to develop a coordinated status and effectiveness monitoring program will begin in 2004. The draft Federal RM&E Plan anticipates that the information from these pilot studies and from the Independent Scientific Advisory Board review will be used to inform and expand a coordinated monitoring program to additional subbasins. NOAA Fisheries recommends that the Action Agencies plan to implement an appropriate portion of the coordinated program (including data management needs).
5. As stated above and in Question 2, access to data generated by regional monitoring activities is important for evaluating Opinion implementation relative to performance standards. A joint NOAA Fisheries and Council project made general recommendations for developing a regional data management system. Subsequently, the Columbia Basin Cooperative Information System team developed a more detailed work plan, which will require multi-agency funding and effort to implement. NOAA Fisheries recommends that the Action Agencies plan to implement an appropriate portion of the coordinated program to ensure availability and accessibility of data for evaluating performance standards for ESA-listed fish.

On June 23, 2004, the Action Agencies transmitted an "Amendment to the 2004/2004-2008 Implementation Plan for the FCRPS Biological Opinion Remand" (hereinafter, "Amended 2004 IP"). The Amended 2004 IP responds to each of NOAA Fisheries' five recommendations and describes actions that the Action Agencies have determined will allow them to fully implement the recommendations. It also explains that most other activities will be implemented in a manner similar to implementation during 2002 and 2003. Finally, it includes a proposal to modify the summer spill program during 2004. A "Final Proposal for Federal Columbia River Power System (FCRPS) Juvenile Summer Spill Operations," dated June 22, 2004, provides additional details regarding the summer spill modification. The Action Agencies also provided a "2003 Progress Report for the Federal Columbia River Power System" to provide context for the Amended 2004 IP.

This Findings Report reviews the Amended 2004 IP to determine whether it is consistent with the Opinion's RPA. In forming this determination, NOAA Fisheries relied on the best available scientific and technical information.

2.0 Review of Amended 2004 Implementation Plan

2.1 Implementation of Actions to Address Recommendations in NOAA Fisheries' 2003 Implementation Progress Evaluation Report

Section I.B. of the Amended 2004 IP summarizes the Action Agencies' response to the five recommendations NOAA Fisheries included in the 2003 Implementation Progress Evaluation Report (see Section 1.0, above). The Action Agencies' responses indicate progress in dealing with the issues raised by NOAA Fisheries. The inclusion of a "fix-it" loop and maintenance of Action Agency funding for responses to technical comments in the subbasin planning process (Recommendation 1) is particularly encouraging.

2.2 Proposed 2004 Summer Spill Modification and Offsets

2.2.1 Proposal

Spill Modification

RPA Action 54 states that the Corps and BPA shall implement an annual spill program for listed Snake River fall chinook salmon, consistent with the spill volumes and total dissolved gas limits identified in Table 9.6-3. The planning dates for the summer spill program are June 21 to August 31 in the Snake River and July 1 to August 31 in the lower Columbia River. Exceptions to the spill levels identified in Table 9.6-3 were anticipated to accommodate new information regarding total dissolved gas levels; short-duration spill adjustments to accommodate research, adult passage, navigation, and other project-specific limitations; and emergencies.

For 2004 only, the Action Agencies propose to cease spilling at The Dalles and Bonneville Dams on August 1 (one month earlier than anticipated in RPA Action 54) and cease spilling at Ice Harbor and John Day Dams on August 26 (six days earlier than anticipated in RPA Action 54). The purpose is to reduce operational costs, while achieving similar or better juvenile Snake River fall chinook salmon survival, compared to the survival expected in the Opinion, through offsetting actions.

Summer Flow Modification Offset

BPA proposes to offset the spill reductions with increased flows from the Idaho Power Company's (IPC) Brownlee Reservoir, part of the Hells Canyon Complex, a Federal Energy Regulatory Commission (FERC)-licensed project. A draft of 100 thousand acre-feet (Kaf) of water in July is offered as an offsetting benefit that would not otherwise be expected in 2004. Although RPA Action 32 states that the Action Agencies shall acquire water for instream use from USBR's Upper Snake River Basin projects and Idaho Power Company's Hells Canyon Complex during the spring and summer flow augmentation periods to improve the likelihood of

achieving spring and summer flow objectives at Lower Granite Dam, the Opinion does not anticipate acquiring water from the Hells Canyon Complex until completion of ESA Section 7 consultation with FERC and IPC. As of 2004, FERC has not completed an ESA Section 7 consultation with NOAA Fisheries and will not complete one in time for the relevant flow operation this year.

BPA has purchased the storage rights to 100 Kaf from IPC for release during the month of July to improve the survival of migrating juvenile Snake River fall chinook salmon. Because the RPA's pre-condition (consultation with FERC) has not yet occurred, this purchase goes beyond the requirements of RPA Action 32. BPA's agreement with IPC indicates that the 100 Kaf is above and beyond the releases that would most likely occur during IPC's normal summer operation. It is also timed so that it is likely that this volume of water is above and beyond that provided from the Upper Snake River by USBR as a requirement of the Opinion for its Upper Snake irrigation projects.

The Action Agencies have also proposed an additional offsetting action, increasing the bounty on northern pikeminnow removal. NOAA Fisheries acknowledges that this action should increase survival of juvenile Snake River fall chinook salmon above the current level and cushion the risk associated with the reduced spill. However, RPA Action 100 states that the Action Agencies will improve the ongoing Northern Pikeminnow Management Program and contains no express statement about the extent of improvement contemplated or the timetable for such improvement. For this reason, and to be conservative, NOAA Fisheries is not crediting the reduction in predation resulting from the increase in the Northern Pikeminnow Management Program in 2004 as an offset to the proposed reduction of summer spill.

2.2.2 Effect of the Proposal

Juvenile and adult Snake River fall chinook salmon, adult Snake River steelhead, adult Upper Columbia River steelhead, adult Mid-Columbia River steelhead, and some populations of adult Lower Columbia River steelhead and adult Lower Columbia River chinook salmon will be migrating past one or more of the dams described above during the periods of curtailed spill. Additionally, various unlisted species, such as juvenile and adult Upper Columbia River summer/fall chinook salmon, will be migrating past these dams in August. Of the listed ESUs, juvenile Snake River fall chinook salmon will be the species and life stage most affected by the proposed modification.

Effect of Spill Modification

NOAA Fisheries has evaluated the effect of reducing spill at four FCRPS mainstem hydropower projects during August in a June 30, 2004, memorandum from the Hydropower Division's FCRPS Branch to Regional Administrator R. Lohn titled "Analysis of Action Agencies' June 22, 2004, Summer Spill Proposal – Impacts on Listed Wild SR Fall Chinook Salmon in Comparison

to Proposed Brownlee Flow Augmentation Offset” (Appendix 1) NOAA Fisheries sought input from regional salmon managers on the analytical approaches and methods described in this memorandum during a public meeting on May 11, 2004. To summarize, NOAA Fisheries has evaluated the effect of reducing spill during the month of August pursuant to the Action Agencies’ June 22, 2004, final summer spill proposal compared to survival under the 2000 FCRPS Biological Opinion spill program.

The analyses of both juvenile fish impacts under curtailed spill operation and the flow augmentation offset include considerable uncertainty, as it is difficult to predict a specific level of effect in either case. Estimates of differences in juvenile fish survival between alternative spill scenarios were determined using the NOAA Fisheries SIMPAS model (Appendix D of the Opinion). Current operations under the Opinion include a full collection and transportation strategy for listed Snake River fall chinook salmon and this was also assumed in the modeling studies. Under a maximum collection and transportation modeling assumption, the majority of juvenile fish are transported. Thus the relative differences in resulting system survival estimates are very small, and applying these small survival differences to an assumed starting population of fish at Lower Granite Dam to obtain small differences in numbers of juvenile fish implies a precision in the passage model output that may be beyond the range of supporting empirical data. There is also considerable uncertainty about the benefit of transporting this species.¹ Nonetheless, the survival estimates below represent our best effort to inform the Federal Executives’ decision about the summer spill proposal with clear and open application of the best available scientific information.

The range of effects on listed wild Snake River fall chinook salmon is estimated to be between approximately 100 and 900 juvenile fish. The effects were estimated under a range of migration patterns (from early to late) and a range of potential impacts from low to high.² Curtailed spill can affect migrating adult salmonids at some projects by increasing the number that fall back through turbines. Scientific information relevant to this issue is extremely limited. However, upon review of available adult salmon radio-telemetry data, survival rates of upstream migrating adult steelhead, adjusted for harvest, in years 2000, 2001, and 2002 were quite similar (87.6%, 87.7% and 88.8%, respectively), even though 2001 had very little spill at dams compared to the other two years. Fall chinook salmon adult survival was greater than the Opinion’s adult performance standard in a year with spill (2002) and a year with little spill (2001). Thus, based

¹In the Northwest Fisheries Science Center’s May 6, 2004, draft technical memorandum titled “Effects of the Federal Columbia River Power System on Salmon Populations,” Williams et al. reviewed the available information regarding transportation of Snake River fall chinook salmon. They observed that, “for subyearling chinook salmon, transportation appears to neither greatly harm or help the fish, and thus a combination of transportation and providing good passage conditions for fish not collected and transported is consistent with a “spread-the-risk” strategy until more is known.”

²Ranges in certain fish passage parameters, such as pool survival and FGE, were included in the analysis to capture a low or high impact on juvenile fish survival.

on limited system survival information, it appears that a curtailment of summer spill should not result in a reduction in survival of upstream migrating steelhead and chinook salmon.

Effect of Flow Modification Offset

NOAA Fisheries has also evaluated the effect of increasing flow from the Hells Canyon Complex during July in a June 30, 2004, memorandum from the Hydropower Division's FCRPS Branch to Regional Administrator R. Lohn titled "Analysis of Action Agencies' June 22, 2004, Summer Spill Proposal – Impacts on Listed Wild SR Fall Chinook Salmon in Comparison to Proposed Brownlee Flow Augmentation Offset" (Appendix 1). NOAA Fisheries sought input from regional salmon managers on the analytical approaches and methods described in this memorandum during a public meeting on May 11, 2004. To summarize, the 2.3 kcfs additional flow release from Brownlee Reservoir spread over a three-week period during July would increase water velocity, thereby decreasing fish travel time, in the Lower Granite pool. However, the expected increase in juvenile fish survival as a result of the additional Brownlee discharge during July is slightly counterbalanced by an expected 0.1° to 0.2°C increase in water temperature, based on the Corps' water quality model, and is taken into account in the analysis. NOAA Fisheries estimated the survival effects of the Brownlee flow augmentation under a range of migration patterns (from early to late) and a range of potential impacts from low to high, similar to the spill impact analysis. For example, the flow augmentation survival benefit is estimated to range between about 700 and 1,100 additional juvenile fish surviving to below Bonneville Dam, and the benefit is greater than the projected survival reduction in each of the study cases evaluated. Since the additional flow augmentation from Brownlee Reservoir is expected to increase water temperatures only 0.1°-0.2°C in the Lower Granite pool, there is no expected effect on adult salmon passage.

Effect of the Combination of Reduced Summer Spill and Increased July Flow

NOAA Fisheries estimates 100 Kaf of additional flow augmentation volume drafted from IPC's Brownlee Reservoir during the month of July would benefit listed juvenile fall chinook salmon that are present in Lower Granite Reservoir during July to a level sufficient to offset the adverse effect of the reduced spill operation at four FCRPS mainstem dams during August.

Effects In the Context of the Opinion's Hydro Performance Standards

The Opinion identified three hydro *performance measures*: 1) adult survival through the FCRPS; 2) juvenile in-river survival; and 3) juvenile "system survival" (combined in-river and transportation survival, including 0.24 assumed differential survival of transported fish [D]). Two *performance standards* were specified for each *performance measure*: 1) the post-2000 average should be greater than the 1995-99 average for each performance measure; and 2) the post-2000 average should indicate steady progress towards achievement of the RPA survival rate expected by 2010 for each performance measure. The first evaluation is to occur in 2005. Our

preliminary understanding of progress towards achieving these performance standards for Snake River fall chinook salmon, based on a June 30, 2004, memorandum from J. Ruff to B. Brown titled "Estimation of Hydro Performance Standards for Snake River Fall Chinook" (Appendix 2) follows. This information is preliminary and warrants further discussion with the Action Agencies and others regarding derivation and performance standard measurement tools.

	Preliminary Estimate of Adult Survival	Preliminary Estimate of Juvenile In-River Survival	Preliminary Estimate of Juvenile System Survival With D=0.24
1995-1999¹ Average	71.0	10.2	11.7
2010 RPA² Survival	74.0	14.3	12.7
2000 Estimated	N/A	11.0	9.9
2001 Estimated	92.3	1.5	4.2
2002 Estimated	83.3	N/A	N/A
2003 Estimated	N/A	13.5	11.1

¹These figures are taken from Table 6.2-7 of the Opinion.

²These figures are taken from Table 9.2-3 of the Opinion.

Adult survival estimates through the FCRPS are available in only two years. The adult survival rates for 2001 and 2002 indicate that both the 1994-99 and 2010 performance standards are being met and exceeded for this life stage. The proposed spill modification and offset is unlikely to have any effect on the continued ability to meet the adult fish performance standard.

Juvenile in-river survival has been greater than the 1994-99 average in two out of three available years, but was much lower than that average in the 2001 low-flow and reduced-spill year. The 2010 in-river survival performance standard has not yet been met, and is not expected to be met for six more years. The proposed spill modification and offset should have no effect on the ability to meet this performance standard in 2010, since the benefit of increased flow in July is expected to directly offset mortality associated with spill reductions in August. However, further improvements in in-river survival will be necessary in future years to achieve the 2010 performance standard.

Juvenile system survival has been below both the 1995-99 and 2010 performance standards in each of the three available years. As described above, the 2010 system survival performance standard is not expected to be met for six more years. Juvenile system survival was close to the 1995-99 average in one year, but was much lower in the 2001 low-flow and reduced-spill year. The proposed spill modification and offset should have no effect on the ability to meet this performance standard, since the benefit of increased flow in July is expected to directly offset

mortality associated with spill reduction in August. Continued improvements in system survival will be necessary to achieve the 2010 performance standard.

The Opinion contemplates that the Action Agencies will be making changes over time to improve juvenile survival. It recognizes that not all of those improvements can be achieved immediately since they may require structural changes at the dams and further research. Progress on the removable spillway weir (RSW) at Lower Granite Dam in recent years, the initial completion and testing of the corner collector at Bonneville Dam and the spillway training wall at The Dalles Dam in 2004, the scheduled completion of an RSW at Ice Harbor Dam in 2005, and the commitment of the Action Agencies to pursue installation of RSWs in the near future at Little Goose and Lower Monumental Dams are the kinds of improvements likely to bring the Action Agencies closer to meeting the performance standards.

2.3 Implementation of RPA Actions and Incidental Take Terms and Conditions, Other Than Those Addressed in Sections 2.1 and 2.2

With the exception of the changes that respond to the five recommendations in NOAA Fisheries' 2003 Implementation Progress Evaluation Report (Section 2.1, above) and the proposed 2004 summer spill modification (Section 2.2, above), most implementation actions are essentially the same as those evaluated in NOAA Fisheries' 2003 Findings Report and in the 2003 Implementation Progress Evaluation Report. As stated in previous NOAA Fisheries determinations, these actions are generally consistent with the Opinion.

3.0 Conclusions

NOAA Fisheries finds that the flow and spill modifications contained in the Amended 2004 IP provide the same or greater biological benefits to Snake River fall chinook salmon as the Opinion's RPA. Hence, the Amended 2004 IP, including the spill and flow modifications, is consistent with the determinations, assumptions, and analyses of the Opinion's RPA when NOAA concluded that it would satisfy the ESA Section 7(a)(2) standards.