DEPARTMENT OF ENERGY

Bonneville Power Administration

Columbia River System Operation Review on Selecting an Operating Strategy for the Federal Columbia River Power System (FCRPS)

AGENCY: Bonneville Power Administration (BPA), Department of Energy (DOE)

ACTION: Record of Decision (ROD)

SUMMARY: The Columbia River System Operation Review (SOR) Environmental Impact Statement (EIS) assessed operations at the 14 Federal dams and reservoirs on the Columbia and lower Snake Rivers that have a major influence on the multiple purpose system operation, and for which power production is coordinated under the Pacific Northwest Coordination Agreement. Lead agencies for this six-year process were the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Reclamation (Reclamation), and the Bonneville Power Administration (BPA).

With a growing Pacific Northwest population and limited opportunities for further development on the Columbia River, pressure on river resources and access to them has intensified in recent years. The Federal agencies responsible for river management have tried to accommodate the many demands placed on the river, but conflicts have arisen. In 1990, the agencies recognized the need for a review of the multiple purpose management of the Federal Columbia River Power System.

To meet this need, four proposed actions were considered through the SOR: 1) to develop and implement a coordinated system operating strategy (SOS) for managing the multiple uses of the Federal Columbia River system into the 21st century; 2) to provide interested parties with a continuing long-term role in system planning and operations through a Columbia River Regional Forum; 3) to renegotiate and renew the Pacific Northwest Coordination Agreement (PNCA); and 4) to renew current agreements or develop new Canadian Entitlement Allocation Agreements (CEAA). This Record of Decision (ROD) applies solely to the decision BPA is making on the first of these four actions, selection of a system operating strategy.

Seventeen purposes for SOR were identified in the Final EIS. They ranged from resource protection to maintaining the social and economic health of the region. Institutional and legal considerations were also included. These purposes were used to assess and ultimately select an overall strategy for operating the FCRPS from among the wide variety of possible alternatives considered. The alternative that is being chosen, the selected strategy, is a combination of specific operating requirements for particular reservoirs and a few system-wide criteria designed to accommodate several

river areas. While it is not possible to maximize the benefit in all resource areas due to the competing nature of the many resources, the selected strategy achieves a reasonable combination of operating requirements which emphasize natural resources, such as fish and wildlife, yet preserves much of the benefits obtained as a result of system development. The potential effects on each river resource for all of the alternatives considered are presented in the Final EIS. The Main Report summarizes all of these potential effects. The appendices to the Final EIS provide more detailed analysis for each specific resource area.

The joint involvement in SOR by agencies sharing Columbia River management responsibilities was an important feature of the SOR. Historically, these agencies operated with a certain amount of independence. Growth and the imposition of more exacting environmental oversight made closer coordination imperative. Accordingly major commitments of staff and funding for the SOR were made by the Corps, BPA and Reclamation. They joined as equal partners to conduct this review. Each of the lead agencies has prepared a ROD on the System Operating Strategy to address the agency's individual role in system operation. This ROD is issued by BPA.

THE LEAD AGENCIES: U.S. Department of the Army, Corps of Engineers: The Corps operates and maintains 12 of the 14 projects under study in the SOR. These projects control the lower Snake and Columbia Rivers and provide storage in the upper reaches of both rivers. The Corps has a major role in coordinating multiple uses of the system. It is responsible for managing flood control storage at all major reservoirs in the Columbia River Basin; maintaining navigation locks and channels to accommodate river transportation; and operating fish passage, power plant and recreation facilities.

U.S. Department of the Interior, Bureau of Reclamation: Reclamation operates Grand Coulee and Hungry Horse Dams, two of the storage projects included in the SOR. Because of its size and location, Grand Coulee Dam plays a prominent role in the coordinated operation of the Columbia River system. Storage at Hungry Horse is also valuable because of its headwaters location; water released from Hungry Horse passes through many downstream projects and produces additional energy.

U.S. Department of Energy, Bonneville Power Administration: BPA markets and distributes power generated by the Corps and Reclamation at Federal dams on the Columbia River and its tributaries. The agency sells power from the dams and other generating plants to public and private utilities and large industries, and it builds and operates transmission lines that deliver the electricity. To achieve effective power marketing, the Corps and Reclamation coordinate project operations with BPA. BPA supports system operation by compiling information on weather and predicted streamflows, by modeling future short-term operations, and by optimizing power production.

The Corps and Reclamation develop operating requirements for their projects. These are the limits within which a reservoir or dam must be operated. Some requirements were established by Congress when the projects were authorized; other requirements

have evolved as operations over the years have progressed. Within the operating limits developed by the Corps and Reclamation, BPA schedules and dispatches power. This process requires continuous communication and coordination among the three agencies.

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DECISION:

BPA in conjunction with the Corps and Reclamation has selected a System Operating Strategy (SOS) for the FCRPS. The strategy is intended to meet the underlying need for the SOR and its purposes as originally identified at the beginning of the study. In particular, the strategy 1) supports recovery of ESA-listed fish species by storing water during the fall and winter to meet spring and summer flow targets; 2) protects other resources by managing detrimental effects caused by operations for ESA species by establishing minimum summer reservoir levels, providing public safety through flood protection, and other actions; and 3) provides for reasonable power generation. This strategy was identified as the “SOS Preferred Alternative” in the SOR Final EIS with two exceptions noted below. The lead agencies have also committed to develop and implement, in full cooperation with affected Tribes and agencies, agreements, plans, and actions for management of the impacts of system operations on cultural resources.

The specific operating requirements to meet the selected strategy stem from the "reasonable and prudent alternatives (RPAs)", in the March 2, 1995 Biological Opinion (BO), prepared by the National Marine Fisheries Service (NMFS) and the March 1, 1995 Biological Opinion (BO), prepared by the U.S. Fish and Wildlife Service (USFWS). On March 10, 1995, BPA issued a Record of Decision regarding the biological opinions for operation of FCRPS during 1995 and beyond. The operating requirements adopted from the RPAs and incorporated in the agencies' selected strategy are summarized below.

The Federal agencies will operate the FCRPS to:

1. Manage reservoir operations during the fall and winter to provide specified percentages of confidence of refill to flood control levels in April each year.

2. Provide additional flow augmentation in the Columbia and Snake Rivers and manage these flows during the fish migration season to optimize anadromous fish survival.

3. Release the stored flow augmentation water during the migration season in a manner that strives toward specified flow targets measured at Lower Granite and McNary projects.

4. Manage spill levels at mainstem projects to attain 80 percent fish passage efficiency up to specified total dissolved gas supersaturation percentages, and provide the amount of spill based on actual flow.

5. Transport all juvenile anadromous fish collected at the lower Snake River collector projects during the spring unless established criteria in the Corps' Juvenile Fish Transportation Plan cannot be met or as otherwise directed through regional real-time management processes. During the summer, transport all juvenile anadromous fish collected at the lower Snake River collector and McNary projects unless established criteria cannot be met or as directed.

6. Operate lower Snake River reservoirs within one foot of minimum operating pool (MOP) during the fish migration period.

7. Operate John Day Reservoir within one and one-half foot of minimum irrigation pool (MIP) from April 20 to September 30 each year.

8. Operate turbines within one percent of peak efficiency during the juvenile and adult fish migration seasons which are defined as March 15 through October 31 in the Columbia River and March 15 through November 30 in the Snake River.

9. Manage reservoirs elevations at storage projects to maximum summer draft limits to minimize detrimental effects on resident fish, wildlife and recreational facilities.

10. Protect against flooding by satisfying flood control requirements at all projects.

11. Operate Libby Reservoir consistent with the recommendations of the USFWS BO for Kootenai White Sturgeon.

12. Operate Lake Pend Oreille during the winter at higher levels for a three-year test period in an attempt to improve resident fish spawning and production.

The BOs issued by NMFS and USFWS also contained a number of reasonable and prudent alternatives that direct the agencies to complete a variety of research, development and demonstration projects. These activities may result in future modifications to the physical system and will complement this operational decision or help provide mitigation for the effects of this decision. Decisions on such physical modifications are separate from the operating decision being made here and will be addressed by the Corps in separate processes such as the Lower Snake River Feasibility Study.

Exceptions: The requirements that define the selected strategy outlined above reflect the SOS Preferred Alternative considered in the SOR Final EIS with two exceptions: 1) in the SOS Preferred Alternative, John Day Reservoir was assumed to operate at minimum operating pool levels year-round with a wider operating range, instead of operating at MIP and 2) Albeni Falls was not held to higher winter elevations for resident fish. The impacts of such modifications were however analyzed in the SOR Final EIS. Several alternatives in the EIS had John Day Reservoir operating at levels other than MOP. Likewise, higher winter elevations at Albeni Falls were analyzed in an alternative that was designed to maximize benefits for resident fish, wildlife and recreation (SOS 4c).

BACKGROUND:

A detailed history of the Federal hydroelectric system in the Columbia River Basin is provided in Chapters 2 and 3 of the Final EIS. The 14 Federal dams and reservoirs and their geographical and social setting are described. The electrical transmission system and the range of resources and activities associated with the river are explored.

The need for the project was to review the multiple purpose management of the Federal Columbia River system. To meet that need, the agencies attempted to determine how to balance or mix the often conflicting and competing needs of river users and

resources while safeguarding the environment. Initially, each of the river resources and activities were given equal weight in the SOR. This approach was altered on December 20, 1991, when the Snake River sockeye salmon was listed as an endangered species under the Endangered Species Act (ESA). On May 22, 1992 the spring, summer and fall runs of chinook salmon in the Snake River were listed as threatened. In a separate action, the USFWS listed Kootenai River white sturgeon on September 6, 1994.

These developments resulted in a process with two subparts. One was the assessment of the entire system by the operating agencies - the SOR; the other consisted of consultation on certain listed species, as required by ESA.

In March of 1995, each of the three Federal operating agencies issued individual Records of Decision implementing the NMFS and USFWS BOs for 1995-1998 river operations. This decision reaffirms the ROD issued in March 1995 and is made upon full consideration of the entire SOR EIS record.

TRIBAL AND PUBLIC PARTICIPATION:

The SOR began in 1990 and was designed to provide specific information on river operations, to examine the effects on all river resources of various operating scenarios and to elicit active participation from interested organizations, governments and citizens of the Pacific Northwest. The effort began with an extensive outreach program to solicit the views of all citizens with an interest in river operations (see *Scoping Document*, 1991).

Fourteen technical work groups were created to study the full range of resources and activities associated with Columbia River operations. Approximately 200 Federal and State agency specialists and representatives of industry, citizen and environmental groups participated during some portion of the review, many for the entire duration. Leaders and technical staff of 13 Indian Tribes were involved. Representatives of Tribal governments met with agency managers and provided written comment to make known their concerns about the SOR process and the impacts of dam operations. Tribal resource specialists from several Tribes attended meetings of some of the technical Work Groups.

Three series of public meetings were conducted during the analysis. These meetings accompanied review periods that afforded all parties an opportunity to review the analysis as it was developed and to offer comments. A complete history of the public involvement effort is contained in Chapter 9 of the Final EIS.

Alternatives Considered

More than 90 approaches to river system operations were initially considered. Many were proposed by citizens and organizations, others were suggested by SOR work groups and the project managers. Computer models simulated implementation of all 90 alternatives so that the environmental and social effects and impacts on power generation, natural and cultural resources, and all other river activities could be assessed and compared (see *Screening Analysis, Volumes 1 and 2*, BPA et. al., 1992).

As a result of this initial screening process by SOR work groups and public review of the results, many of the 90 alternatives were redesigned, combined or deemed not practical. Seven System Operation Strategies (SOS) were then analyzed in detail. Various options within these seven strategies were included, so that a total of 21 alternatives were considered for the Draft EIS.

The Draft EIS alternatives were further modified following broad public review of the draft analysis and based on the comments received from Tribes, State and Federal agencies, industry, environmental organizations, and individuals (see Appendix T, Final EIS). Six of the 21 alternatives in the Draft EIS were carried into the analysis for the Final EIS without modification (SOSs 1a, 1b, 2c, 5b, 6b, and 6d). Four alternatives in the Draft EIS were modified following public comment and reconsidered in the Final EIS (SOSs 4c, 9a, 9b, and 9c). Three new alternatives were identified and evaluated in the Final EIS in response to public comment (SOSs 5c and PA) or as a result of recommendations from the 1994-98 BO issued by NMFS (SOS 2d). Several Draft EIS alternatives were eliminated as unreasonable based upon additional analysis results and consideration of public comment (SOSs 2a, 2b, 3a, 3b, 4a, 4b, 5a, 6a and 6c). The Final EIS Main Report describes the evolution of the alternatives on pages 4-4 and 4-5.

The following 13 System Operating Strategies received detailed consideration in the Final EIS. The numbering is not consecutive due to adjustments made in the list of alternatives considered between the Draft and Final EISs.

SOS 1a - Pre-Salmon Summit Operation: This strategy simulates the way the system was operated from 1983 through the 1990-91 operating year, prior to the listing of salmon species under the ESA. Elements of an alternative recommended by the Columbia River Alliance, Recover 1, were included.

SOS 1b - Optimum Load-Following Operation: This option would maximize system benefits for the traditional uses of the system, power generation, flood control, and navigation. It simulates the way the system was operated prior to the Northwest Power Planning and Conservation Act of 1980.

SOS 2c - Current Operation/No Action Alternative: This alternative calls for operations consistent with how the system was operated in 1992-93, after three salmon species were listed under the ESA.

SOS 2d - 1994-98 Biological Opinion: This alternative represents the operation that would have occurred had the recommendations resulting from the ESA consultation completed in 1994 been implemented. It is closest to the way the system was being run just after the analysis in the Draft EIS was completed.

SOS 4c - Stable Storage Project Operation with Modified Grand Coulee Flood Control: This alternative uses specific monthly elevation targets year-round to improve conditions at the major Federal storage projects for recreation and resident fish and wildlife. In response to public comments, this alternative includes minimum elevation levels, known as Integrated Rule Curves (IRCs) for Libby and Hungry Horse Reservoirs.

SOS 5b - Natural River Operation: In this alternative, the four lower Snake River projects would be drawn down to near riverbed levels for four and one-half months during the spring/summer salmon migration period. Construction of new low-level outlets would be required to allow water to bypass the dam, powerhouse, and spillway.

SOS 5c - Permanent Natural River Operation: In this alternative, the four lower Snake River projects would be drawn down to near riverbed levels year-round.

SOS 6b - Fixed Drawdown Operation: In this alternative, the four lower Snake River projects would be drawn down to near spillway crest for four and one-half months during the spring/summer salmon migration period.

SOS 6d - Lower Granite Drawdown: This strategy is similar SOS 6b but draws down Lower Granite only to near spillway crest for four and one-half months.

SOS 9a - Detailed Fishery Operating Plan (DFOP): This operation was recommended by the region's fish agencies and tribes through the Columbia Basin Fish and Wildlife Authority. It would establish flow targets at Lower Granite and The Dalles, draw down lower Snake River projects to near spillway crest for four and one-half months, specify spill levels at run-of-river projects, and eliminate fish transportation.

SOS 9b - Adaptive Management: This modification of DFOP would establish flow targets at McNary and Lower Granite, specify maximum water releases from upstream projects, draw down lower Snake River projects to minimum operating pool, draw down John Day to minimum irrigation pool, and specify spill levels at run-of-river projects.

SOS 9c - Balanced Impacts Operation: This strategy was originally recommended by the State of Idaho, which subsequently withdrew its support. It would draw down the four lower Snake River projects to near spillway crest for about two months during the spring salmon migration period. It also includes flow augmentation at 1994-98 BO levels, IRCs at Libby and Hungry Horse, and a higher winter operating elevation at Albeni Falls.

SOS Preferred Alternative: This strategy adopts operations recommended in the BOs issued in March of 1995. It supports the recovery of ESA-listed fish by storing water in reservoirs during the fall and winter to meet spring and summer flow targets. Minimum summer reservoir levels are used to minimize detrimental effects on other natural resources. Previous adopted levels of flood protection are provided which allows for continued power generation, adequate levels of irrigation and maintenance of shallow-draft navigation.

One additional alternative was considered that was identified after the comparative analysis process for the Final EIS was completed. While the agencies could not incorporate the results of this additional analysis in the comparative analysis in the Final EIS, the effects of the alternative were described in Chapter 4. This alternative was suggested by the Confederated Tribes of the Umatilla Indian Reservation. It was similar to SOS 9a (see above) with higher flow targets during the spring and summer, drawdown to natural river levels at several projects, higher spill levels at remaining projects, and reduced flood control storage space during the winter to allow for higher spring and summer flows. This alternative was designated as SOS 9d.

COMPARISON OF ALTERNATIVES:

Table 1 summarizes the environmental effects for the alternatives. Effects on each major river use are presented and the overall range of economic impact for the alternatives is shown.

Table. 1 How the Strategies Would Affect River Uses

River Resources	SOS 1	SOS 2	SOS 4	SOS 5
Anadromous Fish	Moderate passage survival and adult escapement; slight differences from existing conditions	Survival rates in the middle range of all alternatives; with transport, juvenile survival is high	Survival about the same as SOS 2	Highest in-river survival for Snake River stocks; for other stocks, similar to existing conditions
Resident Fish	Variable conditions among reservoirs and species; pool fluctuations and failure to refill impact productivity	Variable conditions among reservoirs and species; pool fluctuations and failure to refill impact productivity	Best SOS for resident fish; improved productivity at storage projects	Generally poor; some reservoirs have improved conditions under SOS 5c
Wildlife	Resources largely unchanged from current conditions; continuation of downward trends	Long-term downward trends to resources; slight impacts at John Day due to lower reservoir levels	Moderate to significant increases in wildlife habitat at Lake Pend Oreille, Libby, Hungry Horse, and Grand Coulee	Severe reductions in wildlife habitat at lower Snake and John Day projects
Power	Energy production and load shaping maximized; 0.6-1.1% rate decrease	Annual generation costs the lowest of all SOSs except SOS 1; up to 0.4% rate increase	Flows and generation needs mismatched; 1.3% rate increase	Eliminates system load shaping capability; reduces average annual energy generation; 2.5-2.8% rate increase
Flood Control	Flooding risk unchanged from current conditions	Flooding risk unchanged from current conditions; expect annual average flood damage costs are $3.3 million	Increased risk at Bonners Ferry, the upper Columbia, and Clearwater reaches; average annual flood damage costs increase $0.4 million over SOS 2c	Flood risk in all areas similar to SOS 2
Navigation	Normal conditions for shallow draft navigation and reduced costs for Dworshak log transport; net decrease $0.1 million compared to SOS 2c	Shorter Dworshak log transport operating season; total annual costs for navigation is $414.4 million	Longer Dworshak log transport operating season; net decrease $0.2 million compared to SOS 2c	No shallow draft navigation on the lower Snake River for 7 months or permanently; net increase $14 to $38 million compared to SOS 2c
Irrigation, Municipal and Industrial Water Supply	Minor increase in pumping costs at Grand Coulee of $9,000 over SOS 2c	All irrigation needs served	Minor decrease in pumping costs at Grand Coulee of $18,400 over SOS 2c	Drawdowns at John Day and Ice Harbor require pump modifications and increase pumping costs by about $3.3-4.5 million
Cultural Resources	Ongoing shoreline erosion and exposure at same rate as current conditions	Ongoing shoreline erosion and exposure at same rate as current conditions	High rates of shoreline erosion at storage projects; decrease in exposure due to high pools	Dramatic increase in exposure at lower Snake River projects; less shoreline erosion at these projects
Recreation	Annual benefits could increase up to $7.9 million under SOS lb	Annual average recreation benefit is $315 million	Annual benefits could increase $4.2 million	Annual benefits could decrease between $66 and $90 million
Water Quality	Slight decrease in water temperature but increase in total dissolved gas in lower Snake River	Similar to SOS 1 but slight increase in water temperature; decrease in total dissolved gas	Similar to SOS 2 with slightly lower dissolved gas in lower Columbia	Maximum silt concentrations; nearly all excessive dissolved gas eliminated in lower Snake

River Resources	SOS 1	SOS 2	SOS 4	SOS 5
Change in Total Annual System Costs *	-$42 to -$80 million	$29 million, but SOS 2c equals 0 (no action alt.)	$81 million	$266 to $336 million

Table. 1 (Continued)

River Resources	SOS 6	SOS 9	PA
Anadromous Fish	In-river survival for Snake River stocks varies greatly depending on assumptions	Some of the highest and lowest in-river survival depending on SOS option and stock	In-river survival for Snake River stocks similar to SOS 2; in-river for other stocks in the mid- to upper-range
Resident Fish	Impacts generally the same as SOS 5, but not as severe; conditions worse at Lower Granite and John Day	Some of the best and worst impacts of all SOSs; 9a is generally worse, 9b is good, 9c is mixed	Conditions better at Lake Roosevelt, Hungry Horse, Lower Granite, and John Day; worse at Dworshak, sturgeon improved
Wildlife	Wildlife habitat impacts similar to SOS 5; 6d limits impacts to Lower Granite	Significant impacts to John Day under 9a and 9c; 9b similar to SOS 4 with no benefit at Libby and Hungry Horse	Impacts at John Day similar to SOS 5b; stable levels allow some restoration of habitat; some impacts at Grand Coulee
Power	Generation effects similar to SOS 5; generation costs slightly more than SOS 2c; 0.3-0.9% rate increase	Hydropower generation reduced due to high spill and drawdowns; 2.5-4.0% rate increase	Increased water storage in fall and winter and increased spill mismatches flow and generation needs; 2.0% rate increase
Flood Control	Flood risk in all areas similar to SOS 2	Highest flood risk primarily in upper Columbia; average annual flood damage ranges from $0.3 to $0.5 million more than SOS 2c	Upper Columbia flood damages increase $0.2 million over SOS 2c
Navigation	No shallow draft navigation on the lower Snake River or Lower Granite for 6 months; net increase $2 to $12 million compared to SOS 2c	No shallow draft navigation on the lower Snake for 3 or 6 months; net increase up to $12 million compared to SOS 2c	Normal operations for navigation; shorter Dworshak log transport season; net increase $0.1 million compared to SOS 2c
Irrigation, Municipal and Industrial Water Supply	Drawdowns at John Day and Ice Harbor require pump modifications and increase pumping costs by about $1.4-2.6 million	Similar impacts to SOS 6 at Ice Harbor and John Day; minor increase in pumping costs at Grand Coulee up to $34,900	Minor savings in pumping costs at Grand Coulee; $1.5 million increase at John Day, $4.3 million increase for M&I
Cultural Resources	Similar to SOS 5 but less dramatic	Increased shoreline erosion and exposure due to drawdown; increased bank sloughing due to flow augmentation	Little overall change from current conditions; site exposure increases at Dworshak and John Day
Recreation	Annual benefits could decrease up to $40 million	Annual benefits could decrease $35 to $97 million depending on option	Annual benefits decrease by $26 million
Water Quality	Major sediment transport similar to SOS 5; dissolved gas and water temperature similar to SOS 2	Highest impacts due to water temperature and total dissolved gas supersaturation	Similar to SOS 2 except high total dissolved gas in the lower Columbia
Changes In Total Annual System Costs *	$78 to $145 million	$233 to $400 million	$164 million

* Includes capital expenditures to modify existing dams.

RATIONALE FOR THE DECISION:

A major issue in this decision was Snake River salmon recovery. Events, such as ESA listings and corresponding BOs have dramatically impacted FCRPS operations. Many of the system operating strategies were designed specifically to test their potential to aid the migration of juvenile salmon.

While there is no single equation or formula that can be used to weigh each of the decision factors below in order to select the best alternative that will completely satisfy the needs of all competing interests, the extensive information collected and analyzed during the SOR process has provided the decision maker with a better understanding of the complex interactions among these resources. Consequently, BPA has been able to select an operational strategy that weighs all of the competing interests and strikes the best balance under the circumstances.

The decision criteria used for selecting the System Operating Strategy are listed below, followed by a description of how each is addressed by the selected strategy. Comparisons are between the selected strategy and the No-Action alternative (SOS 2c).

The environmental effects that guided this decision are presented in detail in Chapter 4 of the Final EIS and in the numerous appendices that focus on each river use or resource. Specific details on the effects for all alternatives including the selected strategy can be found in that chapter. A synopsis of the expected change from the No-Action Alternative conditions is summarized below. It is organized around the decision criteria which represent a comprehensive view of all uses.

I. Resource Criteria:

a. Protect and preserve threatened, endangered, and sensitive species

Salmonids: With the selected strategy, juvenile Snake River anadromous fish in-river survival falls in the middle range of all alternatives considered. The analysis of the alternatives shows that transporting juvenile fish increases their survival rates compared to in-river migration. For this strategy, in-river survival of most mid-Columbia and lower Columbia River stocks falls in the mid-to-upper range. With the selected strategy, adult production for all six stocks evaluated was in the upper range of all alternatives.

Sturgeon: The selected strategy carries out the provisions of the USFWS BO providing substantial improvement in conditions for Kootenai River white sturgeon. Flow releases will be made from Libby Reservoir during May and June to aid spawning and recruitment in the Kootenai River.

Other Species: The selected strategy requires that storage reservoirs be managed to provide specified percentages of confidence of refill to flood control elevations by April of each year, which generally coincides with the start of the reservoirs' highest productivity period for resident species. In addition, refill is targeted to occur by the end of June and minimum summer reservoir limits are applied through August. These provisions provide some protection and enhancement to other listed or sensitive species that rely on the reservoirs for their habitat, food supply or reproduction.

b. Provide equitable treatment of fish and wildlife

Resident Fish: The selected strategy is in the upper range of alternatives in terms of improving resident fish habitat and production. These conditions improve slightly in Lake Roosevelt, Lower Granite Reservoir, and other lower Snake River reservoirs, but decline slightly at other projects, in particular at Dworshak reservoir. As described above, the selected strategy includes several provisions that attempt to balance the needs of resident fish with those of anadromous fish, in particular, the adoption of specific reservoir elevation limits.

Wildlife: The selected strategy would desiccate some existing wetland, riparian, backwater and pond habitats at John Day Reservoir. Population reductions will occur for waterfowl, colonial nesting birds, non-game birds, aquatic furbearers, reptiles and other wildlife species. Reductions also occur to waterfowl, colonial nesting birds, nongame birds and amphibians at Grand Coulee (Lake Roosevelt). Adverse effects to shorebirds and cobble habitat in the Hanford Reach could occur but waterfowl and colonial nesting birds would benefit.

c. Protect and enhance environmental quality

For the following resources, the selected strategy causes limited, site-specific impacts which are not very different than what has occurred with system operations in the past.

Water Quality: The selected strategy would have overall water temperatures similar to the No-Action Alternative operations. Gas saturation would exceed the standard at The Dalles for an additional 33 days but would be about average in the mid-Columbia and lower Snake Rivers. Sediment transport would be unchanged.

Earth Resources: The selected strategy would result in moderate decreases in erosion, mass wasting, sedimentation and ground-water fluctuations at Libby and Hungry Horse. Moderate increases in these effects would occur at Dworshak. There would be little to no effect at other reservoirs.

Air Quality: The selected strategy would result in low dust emissions in small concentrations for all wind speeds at Lower Granite. Air pollutant emissions from thermal power plants needed to replace lost hydroelectric generation would increase but the minimum air quality criteria for the year 2004 would be satisfied.

Aesthetics: For the selected strategy, there would be minimal increase in shoreline exposure at the run-of-river projects on the lower Snake River. Shoreline exposure at Libby, Albeni Falls, and Grand Coulee would remain relatively unchanged. Significant increase in exposure would occur at Dworshak and a decrease would occur at Hungry Horse.

d. Provide opportunities for recreation on lakes and reservoirs

With the selected strategy, overall visitation at reservoirs would decline by 6.2 percent, a $26.4 million decrease in annual benefits (all monetary figures based on a 3 percent

discount rate). This result reflects the fact that optimal access to recreational opportunities is based on the current level of development for the system and an operation designed around that development. The selected strategy departs from the optimal operation from a recreational viewpoint. However, a broad mix of opportunities for recreation is preserved and specific operating requirements in the strategy were included to minimize the reductions that were estimated for this strategy in the Final EIS.

Significant increase in visitation is projected to occur on the Clearwater River. A slight increase would occur at Lake Pend Oreille, Lower Granite, and Hungry Horse Reservoirs. A significant decrease in visitation would result on the Kootenai River, at Dworshak, and John Day Reservoirs with slight to moderate decreases at Libby and Grand Coulee Reservoirs. All decreases in visitation occur because summer reservoir elevations are lower than what would occur under the No-Action Alternative.

e. Provide an economic, reliable, and environmentally sound power system

With the selected strategy, increased water storage in fall and winter and increased spill during spring and summer would mismatch streamflows and generation as compared to past operating strategies. The selected strategy contains higher spill amounts to benefit migrating juvenile salmon. Average annual hydropower generation would decline slightly with these higher levels of spill. Likewise, with lower winter flows and higher spring and summer flows, BPA would be faced more often with the need to purchase power during high load periods when prices are higher and have surplus power when power prices are lower. This would result in an annual generation cost increase of approximately $126 million on average but is not expected to raise current wholesale power rates by any significant amount.

While the selected strategy would increase costs, the reliability of the power supply would remain high. The timing for power generation is adjusted to match with the needs of the listed species. Conflicts between power and fish are resolved in favor of the fish, providing equitable treatment of fish and wildlife with the other purposes for which the FCRPS is operated.

f. Provide an economic and dependable flood damage reduction and public safety system

The selected strategy would leave the risk of flooding unchanged in the lower Columbia and Snake River areas. However, with changes in winter operations at storage projects in the Upper Columbia area, the selected strategy results in a slight increase in annual flood damages, approximately $200,000 more on average than the No-Action Alternative, but the risk of flood events is essentially unaffected.

g. Provide an adequate supply of irrigation, municipal, and industrial water

For irrigation water supply, the selected strategy would result in minor savings for

pumping costs at Grand Coulee. There are no changes in pumping costs or conditions at Ice Harbor or John Day. For municipal and industrial water supply, the selected strategy has no impact. The current level of development in irrigation and water supply facilities is preserved and access to water sources is unaffected.

h. Provide waterborne transportation capability

The selected strategy maintains current conditions for deep draft and shallow-draft navigation on the mainstem Columbia and Snake Rivers. Annual shallow-draft navigation costs are unchanged from the No-Action Alternative. With deeper, more frequent drafts for Dworshak Reservoir during the summer, the selected strategy shortens the operating season for log transport. Annual costs are estimated to be approximately $100,000 higher on average than the No-Action Alternative.

I. Protect and preserve cultural resources

The selected strategy, as was the case with all alternatives considered in the Final EIS, continues to cause adverse impacts to cultural resources. Greater shoreline area will be exposed at Dworshak and John Day compared to the No-Action Alternative, which could be beneficial in terms of improved access for tribal members, but will make sites more visible to the public, thus increasing likelihood of vandalism, artifact theft, wind erosion, and other damaging effects.

Traditional cultural properties and resources valued by Native Americans will also continue to be affected. These resources include cemeteries, fishing and hunting areas, ceremonial grounds, sacred places, social and political meeting areas, plants and other life forms. Harmful effects to these resources involve wave and wind erosion, exposure of burials, loss of natural resource habitat, and loss of access for tribal members.

The relatively small number of sites at the reservoirs which are now listed on the National Register of Historic Places will continue to be adversely affected to varying degrees. Most of the known and potential sites have not been evaluated for National Register eligibility, so the ones listed are a small fraction of sites that could ultimately be nominated and listed.

Most cultural resources are irreplaceable, nonrenewable resources. The impacts of system operations, especially when combined with contributing factors such as recreation, housing, industry, agriculture, and transportation, could eventually destroy a large percentage of the cultural resources at the reservoirs. The cumulative effect would be the loss of heritage sites and traditional cultural resources from a river system in an entire region.

In view of these serious impacts, the selected strategy includes the adoption of BPA's commitment to enter a cooperative planning process leading to long-term protection of cultural resources (see section titled Mitigation, in the following pages).

j. Protect and enhance socioeconomic well-being

While the selected strategy attempts to protect the economic well-being of the region, there would be increased costs and reduced benefits from its implementation in some areas. Most notable is the increase in power production costs (described above). Significant increased costs or reduced benefits were estimated for recreation. Minor cost increases were found for navigation, flood control and commercial fishing. Overall, the selected strategy would result in approximately $158 million additional annual average regional costs or benefits lost as compared to the No-Action Alternative.

From a social perspective, an estimated reduction of 4,000 jobs could occur with an annual average cost to the region of $113 million in lost income. There would be an increase in social stress attributable to the lost employment and income, primarily focused in the lower Snake and mid-Columbia River subregions. The changes occur because of increases in grain transportation costs, lower levels of fish harvest, higher irrigation costs, higher power costs and lower level of recreation activities.

II. Institutional Criteria

a. Provide direct public access to the ongoing decision process and operating strategy governing the Columbia River system

The decision on the selected strategy benefited from the extensive public review and discussion held during the SOR. The views of and participation by citizens with an interest in river operations were sought from the outset of the process. To determine the range of issues which needed to addressed, public meetings were held in August 1990 in 14 Columbia Basin communities. Another round of public meetings was held in September of 1994 to present the findings contained in the SOR Draft EIS and to provide opportunity for public comment.

Wide public participation in the 14 SOR work groups was solicited and a newsletter describing each stage of the process was mailed regularly to over 5000 individuals and organizations.

Public involvement influenced the process in many ways. Response to the Draft EIS

resulted in the analysis of several additional approaches to operating the system. At the urging of the State of Montana, an alternative calling for Integrated Rule Curves at Libby and Hungry Horse (SOS 4) was examined. SOS 9, which eliminates fish transportation, was analyzed at the urging of State fish agencies and Native American Tribes. SOSs 5 and 6 - Natural River Operations and Fixed Drawdown were studied at the behest of environmental organizations and others interested in anadromous fish recovery.

Appendix T of the SOR contains nearly 1000 pages of comments on the Draft EIS by members of the public and interested organizations. Each comment is accompanied by a response from the agencies. Many comments resulted in modifications and additions to the Final EIS. Each was considered in identifying the selected strategy.

The SOR also proposed to consider another decision formalizing a process for periodically updating the initial selected strategy and providing direct public access to revising the operating strategy. This process and any resulting decision are separate from the action being considered in this ROD and if pursued, will be documented with an additional ROD.

b. Create and maintain a technical database for operating decisions

The selected strategy is based on and supported by a broad range of technical information developed through the SOR process. Extensive modeling of the selected strategy was completed to determine its environmental effects and to compare these effects to those associated with other alternatives. These results provided the technical information base to support this decision and should assist in making future adjustments to these operating decisions.

III. Legal/Regulatory Criteria

a. Implement recommended near-term actions within existing authority

Near-term decisions are those for which authority currently exists, can be implemented without delay and can provide benefit immediately. Some near-term decisions may be interim or temporary measures that precede the implementation of long-term measures. The selected strategy includes operating requirements that represent near-term actions. One or more of the Federal agencies possess authority to implement all provisions of the strategy described above, thus implementation can proceed without delay and should allow for immediate benefit.

b. Identify areas where new authority is required to implement recommended long-term actions

The selected strategy is based on a majority of the operating provisions contained in the reasonable and prudent actions of the BOs issued by NMFS and USFWS. These actions, in total, avoid jeopardy of listed species. As such, both near-term and longer-term actions were identified. The longer-term actions may require the Federal agencies to obtain new authority to implement fully. The selected strategy recognizes the possibility of these future activities and does not constrain their authorization at some future point in time. Likewise, the selected strategy does not over reach the limits of current authority for the measures being implemented.

c. Satisfy existing contracts

The selected strategy does not affect, alter or conflict with the statutory or contractual obligations previously made by the Federal agencies. The decisions on operating requirements under the selected strategy will constrain power operations for all BPA power transactions. However, BPA will serve its contractual obligations and market power and services with available resources consistent with the operating constraints that apply to each resource.

d. Comply with environmental laws and regulations

The decision on the selected strategy was made as a result of extensive environmental analysis and a comparison of effects among a wide range of proposed alternatives. The effects of the strategy were evaluated in context of existing environmental laws and regulations. It does not violate any such laws and satisfies the requirements of the laws directly affected by the decision. For example, the strategy reflects the results of consultation required by the Endangered Species Act. Likewise, mitigation commitments are being made for cultural resource protection and preservation according to the National Historic Preservation Act.

e. Secure Native American treaty rights and obligations regarding natural and cultural resources

To the extent that the selected strategy provides for effective protection and mitigation of natural and cultural resources, then it may help secure and protect Native American treaty and executive order rights and meet agency trust obligations. The selected strategy includes operating requirements designed to protect listed salmon species as identified by NMFS, to protect other listed species according to the opinion of the USFWS, and to improve the quality of other natural resources through reservoir operation and management of natural streamflows. However, affected Tribes and members of the Cultural Resources Work Group have reported that the selected strategy, like all other alternatives examined in detail in the Final EIS, will not prevent the overall decline of resources associated with Native American cultural traditions.

Habitat for some important species may be eliminated, cultural sites may be lost, and access to important places or resources will be further reduced. BPA is committed to work with affected Tribes to develop and implement long-term agreements addressing the impacts to cultural resources and to continue mitigation efforts under the Fish and Wildlife Program (see Mitigation, following pages).

Summary

In summary, the selected strategy represents a balance among many conflicting and competing resources. As noted at the outset, the rationale for the decision is based on a comprehensive, yet balanced review of all of these important resources. To emphasize one river use or need would invariably impact other resources. The analysis process conducted during the SOR involved repeated attempts to combine the various individual requirements of river resources to find a mix that provided the most benefit with the least harm. In every instance, each of the proposed alternatives would have a negative impact on at least one resource. In the end, the needs of listed anadromous fish became a major factor for selecting the preferred strategy. The operating requirements of the selected strategy were tempered by the level of impact imposed on other resources. By examining the analysis results carefully and by considering the extensive public comment, the requirements were tempered to reduce but not eliminate the level of impact to these other resources. Establishment of minimum summer reservoir levels, thereby reducing the amount of flow that could be provided to salmon, recognized the needs of resident fish in the reservoirs and attempted to provide adequate, yet not ideal, conditions for recreation. Other such examples could be cited. In the final outcome, the selected strategy is an attempt to improve conditions for salmon and do as little harm as possible to all other river resources.

ENVIRONMENTALLY PREFERABLE ALTERNATIVES:

The selected strategy for SOR is based on the BOs issued in March 1995 by NMFS and the USFWS. Since environmental protection for anadromous fish and other listed species became the focus of this analysis, the selected strategy is an environmentally preferable alternative. It favors ESA-listed species as a matter of compliance with law and policy.

The selected strategy is focused on the protection of anadromous fish at the expense of other species, primarily resident fish and wildlife. It is possible to design additional environmentally preferable alternatives by choosing different combinations of operating measures that reflect other tradeoffs among river uses and resources. For example, a second environmentally preferable alternative could be designed which would contain elements from several SOSs considered in the Final EIS.

The stabilization of pool elevations at the Libby and Hungry Horse Reservoirs as specified in SOS 4c would improve conditions for resident fish without large decreases in downstream flows lower in the basin. Historic operations or nearer to full pool elevations at the John Day Reservoir (instead of minimum irrigation levels, as called for

in the selected strategy) would preserve extensive and important wildlife habitat. Less drafting during the fall and winter at Lake Pend Oreille would provide improved resident fish spawning and habitat. Different management of reservoir elevations during the spring and summer at Grand Coulee and Dworshak would provide water retention time improvements and possibly reduce resident fish entrainment.

These reservoir elevation requirements combined with the flows, spills and other requirements directed toward ESA-listed species in the selected strategy would form this second environmentally preferable alternative.

MITIGATION:

Through the analysis process, numerous monitoring and mitigation measures for the various alternatives were identified. These mitigation and monitoring ideas, which are included in the EIS technical appendices, offer practical means to avoid or minimize environmental harm from the selected strategy. Many of the suggestions are appropriate for consideration when implementing the selected strategy. BPA is committed to mitigation for anadromous fish, resident fish, wildlife and water quality as part of the implementation of the Northwest Power Planning Council's (Council) Fish and Wildlife Program and the provisions contained in the BOs. The lead agencies have made a separate but similar commitment toward cultural resource mitigation. Mitigation measures are categorized below by the individual river resources.

Fish and Wildlife: Anadromous Fish

Improving conditions for anadromous fish is the primary objective of the selected system operation strategy. This action by itself is a monumental mitigation action. In addition to these operational requirements in the selected strategy, there are a number of non-operational mitigation measures BPA implements that benefit anadromous fish, resident fish, and wildlife. BPA will fund additional mitigation as part of the reasonable and prudent alternatives in the NMFS and USFWS BOs, as well as continue to be the primary implementor of the Council's Columbia River Basin Fish and Wildlife Program (1994) (incorporated herein by this reference). Activities affecting hatcheries and fish habitat will be pursued, both of which affect the life cycle of anadromous fish (see the Council's Program, Sections 2 through 9). Specific actions are identified in the program and prioritized each year through a process developed by the Council in cooperation with Federal, state and tribal fish and wildlife agencies. BPA will fulfill these responsibilities through its implementation of the fish and wildlife budget plan made by the Northwest Congressional delegation and the Administration (see letter of October 24, 1995 from Alice Rivilin, Director of the Office of Management and Budget, to Senator Mark Hatfield (incorporated herein by this reference)). A memorandum of agreement that implements the fish and wildlife budget plan has been negotiated among BPA, NMFS, the USFWS, Reclamation, Corps, and the Council in consultation with Northwest Indian Tribes. Even without this memorandum of agreement, BPA would continue to implement measures to protect, mitigate, and enhance fish and wildlife affected by the FCRPS in a manner consistent with the Council's Program, and

meet its responsibilities to avoid jeopardy and aid in the recovery of species listed under the ESA.

Resident Fish

Numerous mitigation ideas surfaced during the environmental analysis to protect and mitigate resident fish in the various reservoirs and river reaches in the system. See Appendix K of the Final EIS for the complete list of ideas. As with anadromous fish, mitigation actions for resident fish are included as a part of the Council's Fish and Wildlife Program and are recommended through the program prioritization process described above under Anadromous Fish. Representatives working in that process would be well served to examine the suggestions contained in Appendix K as they identify and prioritize new mitigation actions. BPA is committed to fund measures consistent with those contained in the Council's Program, Section 10, to the extent funds are available and BPA has the authority and responsibility to implement them. In addition, the Federal agencies will implement the operating provisions of the BO issued by the USFWS directed at Kootenai River White Sturgeon.

Wildlife

The analysis in the Final EIS identified several mitigation options to enhance wildlife including land purchases, development of additional habitats to replace affected habitats in adjacent or other locations, development of springs, artificial cover, perennial grass seedings, and habitat restoration using irrigation seepage. Nine proposals for monitoring effects of system operations on wildlife were also presented in Appendix N of the Final EIS. Again, BPA is committed to fund these measures consistent with the Council's Program, Section 11, to the extent funds are available and BPA has the authority and responsibility to implement them. As with resident fish, representatives in the Council's prioritization process would benefit from reviewing the suggestions in the appendix and incorporating them in the priority setting process. All of these activities are designed to protect and mitigate wildlife and associated habitat affected by system operation.

Water Quality

Mitigation suggestions for water quality concerns were identified in Appendix M of the Final EIS. They fell into three basic categories - water temperature control, gas supersaturation and sediment transport. The selected strategy incorporates operating requirements to manage gas supersaturation. Target flow levels are specified for the mainstem projects. They are combined with specific project-by-project spill percentages that are based on the potential for gas generation of each project. These spill percentages also optimize fish passage at the projects and help manage the number of fish that are transported. In addition, the Corps has as a part of its capital improvements at the projects, plans to install flow deflectors or flip lips to reduce gas supersaturation. These types of construction modifications are considered on an annual basis and fall outside of the operational decision being made here. An overall

gas abatement study is also being pursued to further investigate the problem of dissolved gas and suggest additional construction or operational fixes. BPA will support continued monitoring of water quality parameters and additional actions that arise through the prioritization processes for the Fish and Wildlife Program.

Power

The power analysis assumes that energy and capacity losses associated with the selected strategy would be replaced through acquisition of new resources such as combustion turbines or purchase of power on the spot market. Either of these responses would, in effect, mitigate losses to generation or appropriately match electrical generation with loads. Any generation resource acquisition would be evaluated under the provisions of NEPA before being pursued, separate from this EIS and associated ROD.

Cultural Resources

BPA, the Corps, and Reclamation recognize their responsibility to comply with historic and cultural preservation laws and have committed to a long-term compliance and management effort to address the impacts of the selected operating strategy.

The Final EIS found that operations have adversely affected and will continue to threaten sites along the system which are currently listed on the National Register of Historic Places. In addition, there are potentially large numbers of sites which are unknown or unrecorded, and very few of the known, recorded sites have yet been evaluated to determine National Register eligibility.

Tribal representatives testified that cultural properties, places, and resources which are irreplaceable and of inestimable value in the traditional life of Native Americans have been damaged or lost, or will be threatened by continued operations. Several Tribes also made known their strong desire that the affected places and resources be managed in ways consistent with traditional life.

BPA, the Corps, and Reclamation are committed to working closely with affected Tribes through each phase of this effort. The Tribes are invited to take part in developing

cooperative working processes. BPA will implement these processes, including formal consultation when appropriate, in a manner consistent with the BPA Tribal Policy.

BPA is committed to fund this effort over the long term, beginning in Fiscal Year 1997, with Reclamation and the Corps each providing a share of the funds. The lead agencies are initiating a series of agreement documents. The agencies have mailed a draft Programmatic Agreement for review and comment to affected Tribes, State Historic Preservation Officers, the Advisory Council on Historic Preservation, and other involved Federal agencies. The Programmatic Agreement will allow separate agreements and plans to be developed for individual areas, reservoirs, or parties.

An Interagency Agreement will be drafted by the lead agencies and made available for comment. It will define roles and responsibilities of the lead agencies, including mechanisms for joint funding. Following the Interagency Agreement, additional agreements may be developed between the lead agencies and Tribes, and between the lead agencies and other responsible agencies, to address specific or unique reservoir, affected area, or affected party concerns.

The lead agencies will develop historic property management plans for reservoirs or areas where they do not now exist, or will modify existing plans as needed, to provide for long-term management of affected resources. The agencies will prepare these management plans in full cooperation with Tribes and other involved parties. BPA intends that the individual Tribe's desired approach and preferred methods for cultural resource management will be a major consideration in the development, as well as the implementation, of each of the long-term management plans.

COMMENTS ON THE FINAL EIS

Seven letters commenting on the Final EIS were received. Some of the letters only expressed opinions or requested copies of parts of the SOR documentation. In addition, BPA along with the Corps and Reclamation have continued to coordinate with the regional entities, NMFS and USFWS and others on the system operating strategy. In evaluating the letters and comments received following completion of the Final EIS and the ongoing regional discussions, the following information or issues have been identified.

Cultural Resources

As is noted above, fluctuating water levels, associated shoreline erosion and other results have the potential to adversely affect significant cultural resources at all Federal reservoirs in the FCRPS. The National Historic Preservation Act requires Federal agencies to take into account these adverse effects and to formulate treatments to address them. In a letter, the Confederated Tribes of the Colville Reservation expressed concern regarding fulfillment of agency commitments to formulate such treatments and to carry out cultural resource management activities in cooperation with the Tribes.

As is stated in the Mitigation section of this ROD, BPA, Reclamation and the Corps are currently in the process of cooperatively preparing and consummating a Programmatic Agreement with the President's Advisory Council on Historic Preservation, the involved State Historic Preservation Officers, other affected agencies, and Federally recognized Tribes in the Columbia River Basin.

Pursuant to the Programmatic Agreement, historic preservation management plans will be developed which will identify significant cultural resources, the approaches to resource protection, preservation and treatment, the framework for research designs for data recovery where data recovery is the preferred treatment, plans for site monitoring, plans for public education and interpretation of cultural materials, and plans for the long-term curation of recovered artifacts and information. These plans will be developed in full cooperation with affected Tribes and other involved parties, and will also address issues required by other relevant legislation, including enforcement of the Archeological Resources Protection Act, provisions of the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act.

Dissolved Gas Levels

The Environmental Protection Agency (EPA) in their letter commented that a fish passage spill program, operated in accordance with the total dissolved gas (TDG) variance requested by NMFS, benefits salmon recovery. However, EPA contends that any violation of the TDG standard represents an increment of biological risk to salmonids and that a long-term solution to minimize elevated TDG levels from spill operations is warranted. EPA further stated that if consideration is given to a change in the TDG standard for the Columbia and Snake Rivers, it would constitute a site-specific standard which is a formal change to state water quality standards. Such a decision to adopt a site-specific standard would need to be developed based on a scientifically credible and defensible basis, and submitted to EPA for approval after public participation and formal adoption by the state or tribe.

As part of real-time operations and the Technical Management Team (TMT) process, the Corps monitors dissolved gas levels above and below each of its mainstream Columbia and Snake Rivers projects. Starting in 1996, the Corps developed procedures that would allow a quicker response time for maintenance and repair purposes in the event of high gas levels. Quality control measures have been developed and implemented to ensure timeliness, consistency and reliability of the monitoring. Based on the real-time field data, changes to spill and other reservoir operations can be made quickly to prevent and/or correct excessively high dissolved gas conditions. The TMT has also recognized the need to include a Dissolved Gas Management Appendix in the Annual Water Management Plan. In the near-term, fish passage spill will be provided subject to the following conditions: 1) spill requests which would exceed state water quality standards will be coordinated with the appropriate state agencies, 2) a comprehensive monitoring and evaluation program is operational, and 3) spill at the lower Snake and Columbia River projects would not exceed criteria

identified in NMFS BO. BPA agrees with EPA that a long-term solution that minimizes elevated TDG levels is appropriate and that this long-term program needs to be coordinated with states and Tribes as appropriate.

There was also a concern with involuntary spill due to high flows or limited powerhouse capacity. The Corps, as part of the Columbia River Fish Mitigation Project, is conducting a Dissolved Gas Abatement Study, for which Phase I has been completed, to address long-term measures to reduce gas levels and their effects on salmon. Further phases are planned which may result in additional capital investments in the system in an effort to reduce gas levels as a consequence of operations.

Water Temperature

According to EPA, water temperature standards are being exceeded, and these elevated water temperatures are considered to be a primary limiting factor for fisheries restoration. EPA commented on three issues related to water temperature. First, cold water releases from Dworshak and other deep reservoirs should be considered. Second, passage of juveniles through the warm water forebays as quickly as possible is needed, Third, cooler water needs to be provided at fish ladders.

Water temperatures and the effects of cool water releases from Dworshak and other projects were addressed in the Final EIS. NMFS has considered the temperature effects of the operation required under its BO. NMFS prioritized releases of water for juveniles in the summer over releases in late summer for adults. NMFS also stated that when possible, release of cool water in August and September would be considered. The Federal operating agencies, based on our understanding of the BO and the currently available scientific uncertainty, has decided that water releases should be prioritized for juveniles and will consider releasing water from Dworshak based on the recommendations of the TMT.

As for passage through forebays with high water temperatures, the Corps is testing prototype surface bypass/collection technologies currently as identified in the NMFS BO. These systems may speed juvenile passage once fish arrive in project forebays. Evaluations of juvenile behavior are a part of the investigation of this technology.

NMFS also requested through its BO that investigation of water temperature control in adult fish ladders be conducted. The Corps has included water temperature control in its Columbia River Fish Mitigation Program. They are collecting ladder water temperature data and will evaluate various potential corrective actions.

Baseline Data and Monitoring

Finally, EPA indicated the need for collection of baseline data to assess water quality, sediment and biological effects of proposed operational measures and in particular, drawdown actions. The Corps currently monitors dissolved gas, water temperature, and turbidity at all of its mainstream Columbia and Snake River projects. Regarding the

effects of drawdown actions, the Corps has initiated a Lower Snake River Juvenile Salmon Migration Feasibility Study and NEPA documentation on drawdown alternatives of the lower Snake River projects to spillway crest and natural river levels. Included in this study will be data collection and assessment of water quality, sediment and biological effects of drawdowns.

Columbia River Treaty

Prior to implementing the 1995 Biological Opinion, the Chair of the Canadian Entity, by letter, and the Canadian Government, by diplomatic note, expressed concerns to the U.S. Entity (represented by BPA and the Corps) and the U.S. Government, respectively, on the operation of Libby Dam to provide for sturgeon spawning in the Kootenai River below Libby reservoir. Since that time, the Canadian Government has sent additional diplomatic notes to the U.S. Government on the operation of Libby for sturgeon again expressing their concern over the effects of the operation on downstream power generation in Canada and their belief that the operation of Libby for Kootenai River White Sturgeon under the ESA is inconsistent with the Columbia River Treaty. At the present time, the matter is under consideration by the U.S. Department of State.

CONCLUSION

The agencies have decided to pursue a specific system operating strategy that considers all river uses and resources and is based on a detailed evaluation of the potential impacts on these uses and resources. But, operation of the FCRPS is dynamic as is the understanding of that operation and the effect it has on the environment. For this reason, the agencies support the concept of adaptive management.

As applied to the FCRPS, adaptive management allows river managers to learn from actual experience and to adapt the resulting operating principles or actions to what works, whether designed to enhance a new resource or to preserve an existing one. Operations will be reviewed and monitored as often as necessary to determine if actions are performing as expected. This periodic review will permit course corrections to be put in place to make full use of new information resulting from monitoring, research studies, or other sources. Even though the agencies have decided on a selected strategy that is comprised of specific operating requirements, the agencies embrace the concept of adaptive management.

It is likely that in the future new operating strategies will be developed which rely on the experience gained through the implementation of this initial decision. The agencies are committed to operating the FCRPS in a manner that provides for public benefit, takes into account significant natural and cultural resources, and is flexible to respond to changing conditions and increasing knowledge.

Issued in Portland, Oregon on _____.

_____
Randall W. Hardy
Administrator, Bonneville Power Administration

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