

Impacts of Proposed Columbia River Operations for 2006

Compared to 2004 FCRPS Biological Opinion

November 23, 2005

The federal agencies (NOAA Fisheries, Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration) are proposing a modification to the 2004 Biological Opinion for Columbia River hydrosystem spill and transportation operation in 2006. Our proposal is based on the adaptive management framework of the biological opinion, which provides for the federal agencies to compare various alternatives and to modify actions to improve the survival of listed salmon and steelhead species.

The agencies believe that their proposed spill and transport operation would improve adult returns of Snake River spring/summer chinook salmon and steelhead compared to the plaintiffs' proposal. The agencies regard returning adults that spawn as a true measure of success because, even if a large number of juvenile migrants survive to the estuary, it is of little consequence if they fail to return as adults.

The agencies' proposed alternative does not recommend a substantial increase in spring flows compared to the 2004 Biological Opinion because the available science shows only a weak correlation between flow and survival. Research, however, does indicate that spring migrants return as adults at a higher rate if they arrive in the estuary at the optimum time in their development. For this reason, the federal agencies are taking an adaptive management approach and proposing a spring spill operation that maximizes in-river passage for Snake River spring/summer chinook until April 20, then shifting to a maximum collection and transport operation for Snake River steelhead and late migrating spring/summer chinook salmon during late spring.

Based on recent smolt-to-adult-return data, the agencies' biologists believe this operation will increase spring/summer adult return numbers by about 16 percent for wild spring/summer chinook salmon and nearly 25 percent for wild steelhead over the 2004 Biological Opinion operation. In addition, the proposed operation is expected to enhance adult returns of both hatchery spring/summer chinook salmon and steelhead in the Snake River by roughly 11 and 16 percent, respectively. Since the data is less clear for summer migrating Snake River fall chinook salmon, the federal agencies are proposing acceleration of needed research to test whether these fish are best left to migrate in-river or should be transported. Therefore, the agencies seek to manage the hydropower system with a combination of both spill and transportation that best supports a spread-the-risk approach for the listed juvenile summer migration.

Estimated Number of Adults returning to Lower Granite dam per 100 juveniles (SAR)

	Snake River Sp/Su Hatchery Chinook		Snake River Sp/Su Wild Chinook		Snake River Wild Steelhead		Snake River Hatchery Steelhead	
	SAR	% change from 2004 BiOp	SAR	% change from 2004 BiOp	SAR	% change from 2004 BiOp	SAR	% change from 2004 BiOp
2004 BiOp	1.28	0.0	1.25	0.0	1.92	0.0	0.95	0.0
Plaintiffs' PI	1.27	-0.8	1.22	-2.2	1.88	-1.9	0.94	-1.1
Agencies' Alternative	1.42	10.8	1.44	15.8	2.39	24.7	1.09	15.5

From April 3 to April 19, provide spill at all eight Columbia and Snake river hydropower projects. From April 20 to May 31 maximize transportation at Snake River collector projects and spill at the other federal mainstem dams. Continue spill at all federal mainstem dams after June 1.

Federal Agencies' Proposal	Plaintiffs' Proposal
On Fish Survival	
<ul style="list-style-type: none"> ▪ Increases adult returns of Snake River steelhead and spring/summer chinook. ▪ No change for ESA-listed chum salmon redds which would be dewatered 38% of the time (same as BiOp). Hanford Reach chinook redds would be dewatered 2% of the time (same as BiOp) ▪ Resident fish: No impact compared to 2004 BiOp. ▪ It is presently not known whether juvenile Snake River fall chinook are better off being transported during the summer months or left in the river to migrate. The federal agencies propose a multi-year test to answer that question. ▪ <i>Spread the Risk:</i> For fall chinook where data are uncertain, about 50% would be left in the river and their passage downstream would be aided by increased spill over the 2004 BiOp, while about 50% would be transported by barge ▪ Minimize Total Dissolved Gas levels consistent with 2004 BiOp. 	<ul style="list-style-type: none"> ▪ <i>Decreases</i> survival for migrants: Results in approximately 64,000 fewer Snake River steelhead and spring/summer chinook than the federal agencies' proposed operation. ▪ Less protection for ESA-listed chum salmon redds which would be dewatered 62% of the time and to Hanford Reach chinook redds which would be dewatered 62% of the time. ▪ Lower reservoir levels at Lake Roosevelt would negatively impact resident fish spawning in September and reduce reservoir nutrient levels important to fish and wildlife and lower reservoir levels in Banks Lake would impact vegetation and resident fish and wildlife. ▪ Critical study needs not met: No empirical evidence supports plaintiffs' proposed summer spill operation. ▪ <i>Spread the Risk:</i> Leaves about two-thirds of fall chinook in-river, increasing risk of harm in the face of uncertain data. ▪ Would increase the occurrence of exceeding state water quality standards for Total Dissolved Gas levels.

On Energy Produced by the Regional Hydro System	
<p>Total energy loss to the region beyond the 2004 BiOp is 128 aMW¹</p> <ul style="list-style-type: none"> ▪ Loss of 125 aMW Jan.-Sept. on the federal system. ▪ Loss of 3 aMW Jan.-Sept. for other utilities. ▪ Almost no change to regional or federal generation in January. <p>No operational changes in Canada.</p>	<p>Total energy loss to the region beyond the 2004 BiOp is 770 aMW. (Note: Energy use by a city like Seattle is about 1,000 aMW.)</p> <ul style="list-style-type: none"> ▪ Loss of 640 aMW Jan.-Sept. on the federal system. ▪ Loss of 130 aMW Jan.-Sept. for other utilities. ▪ Reduces regional generation in January by 5,400 aMW. ▪ Reduces federal generation in January by 3,800 aMW. <p>Additional generation impacts may occur in Canada.</p>
On the Reliability of the Regional Power System	
<p><i>Adequate Power Supply to Meet Regional Demand:</i> Probability of inadequate supply, measured as “loss of load probability” remains near 0% this winter.</p> <p><i>System Flexibility:</i> System flexibility is essential for the power system to address daily, weekly, and monthly changes and emergency conditions for energy demand and transmission needs. System flexibility is already constrained to a great extent by fish operations. System flexibility will be only slightly reduced compared to the 2004 BiOp.</p> <p><i>Transmission Limitations:</i> BPA’s transmission network will experience only slight additional impact compared to the 2004 BiOp.</p>	<p><i>Adequate Power Supply to Meet Regional Demand:</i> Initial studies indicate a probability of load loss increasing to ~7.5% this winter, exceeding the industry standard of 5%. It is doubtful that market power would be available to fully meet this shortfall. If further analysis verifies this finding, the region is more likely to have an inadequate supply this winter</p> <p><i>System Flexibility:</i> Even if regional generation is sufficient, under daily and other changing conditions such as a cold snap, system flexibility to respond and capability to meet peak hour demands is reduced.</p> <p><i>Transmission Limitations:</i> Quite apart from generation supply, overloading a constrained transmission system increases the brittleness of the system and increases the odds of reliability problems in the summer. Impacts are difficult to predict depending on where replacement generation comes from (eastside, California, British Columbia).</p>
On Regional Costs and Ratepayer Impacts	
<p><i>Additional Costs:</i> Compared to the 2004 BiOp, estimated average cost to the region is \$46 million per year (based on 50 years of historical water conditions).</p> <ul style="list-style-type: none"> ▪ Would cost BPA about \$43 million ranging up to a loss of \$90 million. ▪ Would cost non-federal system about \$3 million ▪ Modest increase in fish and wildlife program 	<p><i>Additional Costs:</i> Compared to the 2004 BiOp, would cost the region about \$450 million (based on 50 years of historical water conditions).</p> <ul style="list-style-type: none"> ▪ Would cost BPA about \$347 million. That is, assuming that 2006 is an “average” water year as <i>Plaintiffs do</i>, the economic impact to BPA would be \$347 million. The estimated loss for one of the 50 years modeled reached as high as \$541 million. This does not include possible cost of compensation to Canada for lost power production. ▪ Would cost non-federal system about \$100 million ▪ BPA ratepayer impacts: The total cost of

¹ This was averaged for January through September, because these are the months for which the loss occurs.

<p>costs.</p> <ul style="list-style-type: none"> ▪ No change in Treasury payment probability 	<p>BPA's fish and wildlife program (including revenue decreases) in FY2006 would increase to approximately \$1 billion (up from the current \$650 million.)</p> <ul style="list-style-type: none"> ▪ Would add \$5/MWh to BPA's 2007 wholesale power rates. Fish and wildlife program costs would represent 40 percent of BPA's wholesale power rate (up from the current 30%.) ▪ For retail customers: Would increase average retail electric bills for a household by about \$5 per month to about \$15 per month, for households served by one of the 100 regional utilities that buy all or nearly all of their power from BPA. ▪ Disproportionate impact on low income households representing about 30 % of households in the region, where electric space heating is prevalent. ▪ Disproportionate impact on rural Washington and Oregon, where, roughly speaking, the majority of BPA's power revenues from public utilities come from. ▪ Would decrease BPA's ability to make its annual Treasury Payment in 2006 by 12%. Could affect financial liquidity and potentially reliability if BPA doesn't have the cash to purchase power on the market.
<p>On the Regional Environment and Economy</p>	
<p>Largely the same as under the 2004 BiOp.</p> <p>Preserves flexibility to support wind integration.</p>	<p><i>Western Power Costs:</i> Reduction in hydro electricity production would increase wholesale power costs for all west coast consumers by requiring less efficient, and more costly plants to operate to replace the hydro generation and would increase wholesale power costs based on supply and demand.</p> <p><i>Thermal Power Replacement:</i> Reduced hydro generation would likely be replaced by thermal resources. Assuming the alternative fuel is natural gas, this would increase use of natural gas, decreasing supply and increasing prices.</p> <p><i>Renewable Resource Development:</i> A reduction in hydro system flexibility would impair the ability of the hydro system to integrate wind generation, and could thereby become a major impediment to the development of wind resources in the Pacific Northwest.</p> <p><i>Increased Emissions:</i> Annual pollutant emissions resulting from thermal generation to replace estimated average decreased hydro generation would be NOX –</p>

	190 to 8,285 tons, SOX – 32 to 5,514 tons, CO2 – 2,128,478 to 4,771,296 tons ² . (NOTE: The federal agencies' proposal would reduce the estimated emissions of the plaintiffs' proposal, based on 50-year average water by 88%.)
Cultural Resources	
Maintains protection of cultural resources at current levels.	Would expose tribal cultural resources and human remains to additional vandalism and looting by lowering Lake Roosevelt by up to 9 feet in addition to the 10-to-12 foot draft from full already provided and lowering Banks Lake (which has some of the oldest Cultural resource sites in the area) by an additional 5 feet.
Recreation	
No change	Would reduce tourism and negatively affect the economy in the Lake Roosevelt area including impacts on tribal and non-tribal business enterprises. Significantly impacts the tribal house boat rental business which earns several million dollars a year.

² The range of emissions is based on data from the Northwest Planning and Conservation Council and the State of Washington. The NWPCC data is based on a conservative assumption that the mix of resources will be 95 percent combined cycle natural gas, 5 percent simple cycle gas, and 0 percent coal. The NWPCC numbers assume the replacement resources for the lost hydro all meet the emission standards for a new resource. Because there is no time to build and the most efficient plants will already be running much of the time, the NWPCC numbers tend to be low. The State of Washington data assumes the mix of thermal resources available in that state in 2004 and tend to be high because they assume too much coal in the mix.