

March 7, 2022

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Submitted via electronic mail

RE: Additional Columbia River System Operations Monitoring and Study Measures

Good morning,

Northwest public power relies on the Bonneville Power Administration (BPA) for a reliable, cost-effective, and environmentally responsible power supply. For its part, public power has regularly demonstrated its commitment to funding a world-class fish and wildlife program to mitigate for the impacts of Columbia River System Operations (CRSO) in a scientifically sound manner. Public power therefore has vital interests in the system from both economic and environmental stewardship perspectives.

CRSO are entering into a new phase, and relatively novel and largely untested fish conservation measures are being implemented or seriously considered. In upcoming discussions designed to reach a long-term consensus on such operations, public power customers of BPA believe it is imperative to ensure that whatever measures are adopted are in the best interest of endangered salmon and other affected fish and wildlife. To support this goal, we look forward to working collaboratively with federal biologists and technical experts to ensure that existing data are fully analyzed to help inform these important decisions the region faces. At a minimum we also urge careful consideration and adoption of additional monitoring measures to fill gaps that would inhibit fully informed, long-term operational decisions in the best interest of the ecosystem they are designed to benefit.

It is now evident that there is urgent need for additional analyses and monitoring under largely untested river conditions that may have unintended consequences. Upcoming operations for the spring of 2022 call for unprecedented levels and duration of spill and therefore elevated total dissolved gas (TDG) levels. Historical TDG concentrations at or above 125% at CRSO projects are rare. Based on the National Oceanic Atmospheric Administration's (NOAA) assessment of operations last year¹, there is already cause for concern about the impacts to wild juvenile salmonids at lower levels and shorter durations of spill than are presently prescribed for the spring of 2022. Preliminary survival results are unable to discern whether new spill operations benefit or impair juvenile salmonids. For example, survival of certain wild smolts during the spring of 2021 "was by far below average" and the "low survival estimates are concerning as they are occurring during a management regime of extremely high spill rates intended to boost survival" (Hecht 2021). The stakes are high for salmonids and resident fish and wildlife, and it is essential to use and secure the very best data we can to get this right.

The attached document contains additional monitoring, study and analysis requests that we believe should be implemented as soon as possible. We discussed these concepts with federal experts with the intent of making the most targeted and effective requests possible with consideration of both scientific impact and practicability. The goal is to outline additional analyses of existing data and future evaluations to ensure conditions within the CRSO are optimal for the ecosystem it supports, while providing clean, reliable energy to the region.

We look forward to working with you collaboratively to further develop and ultimately implement actions to meet these goals.

Sincerely,



Scott Simms
Executive Director, Public Power Council

Attachment: Additional Columbia River System Operations Monitoring and Study Measures

CC: NW Congressional Delegation
Kathleen Hogan, Principal Deputy Undersecretary, Department of Energy
Michael Connor, Assistant Secretary, Civil Works, Army Corps of Engineers,
Department of Defense
Camille Touton, Commissioner, Bureau of Reclamation, Department of the Interior

¹ Hecht, S. 2021. Memorandum: Preliminary survival estimates for the passage of spring-migrating juvenile salmonids through Snake and Columbia River dams and reservoirs, 2021. Northwest Fisheries Science Center, Fish Ecology Division. Seattle, WA.

Additional Columbia River System Operations Monitoring and Study Measures

Problem Statement

Spill at hydroelectric projects can decrease the proportion of juvenile salmonids that pass downstream via turbines, thereby potentially increasing smolt survival during the seaward migration in the Columbia River. Increasing levels of spill, however, also causes elevated total dissolved gas (TDG), which has direct and indirect consequences to aquatic resources, including direct or latent mortality of juvenile salmonids at or above certain levels. Increasing levels of spill have other unintended consequences beyond increased TDG, ranging from degraded tailrace conditions to negating the benefits of the Smolt Transportation Program. Despite extensive research on relevant topics, a clear understanding of the contradicting effects of increasing spill is lacking. Additional scientific evaluations that would provide critical information to assess elevated spill and TDG levels within the CRSO are summarized in Table 1.

Table 1. Proposed evaluations to support future decisions on Columbia River System Operations.

Evaluation	Concept	Notes
Assess gas bubble trauma in tailrace environments under new spill regime Cost: \$0.3–\$0.5M Timeline: 9 months	Sampling of migratory and resident fish species in areas of highest TDG levels has been limited. These data will provide the ability to directly quantify potential negative effects of high TDG.	USGS is proposing a study for 2022. Safety, laboratory access, and permitting are critical. Investigation is supported by NOAA and USFWS.
Evaluate fine scale smolt behavior and route selection at McNary Dam Cost: \$0.8–\$2.0M Timeline: >1 year	Two key concerns of the CRSO include loss of smolts in the John Day reservoir and detection of PIT-tagged smolts at McNary Dam. A focused telemetry evaluation could inform these issues while also examining how spill levels affect behavior of smolts.	Methodologies are vetted and accepted; supply chain issues are affecting equipment acquisition. Possibility to combine with future studies. NOAA has identified McNary Dam as a critical point in CRSO.
Review and expand water quality monitoring stations in the CRSO Cost: < \$250k Timeline: 6 months	The current network of water quality stations was established over 20 years ago and may not provide the resolution required to assess new operations. A review and additional monitoring stations may provide valuable data.	Desktop evaluation and additional monitoring stations could be quickly deployed, and both are supported by NOAA, BPA, USACE, and USFWS.
Expand laboratory evaluations of TDG effects on aquatic species Cost: \$0.2–\$0.5M Timeline: >1 year	Additional resident fish species and other aquatic organisms could be tested under a controlled environment to better understand negative effects of TDG based on magnitude and duration of exposure.	The USFWS Abernathy and USGS Cook laboratories have capabilities to conduct these evaluations. Surrogate species are available for evaluating effects on Endangered Species Act-listed species such as Bull Trout. This study is supported by USFWS.
Retrospective analysis of large-scale compliance evaluations Cost: \$150k Timeline: 1 year	Dual tagged (acoustic and PIT) smolts used in compliance evaluations provide empirical evidence on both route selection and SARs.	Supported by NOAA: regulators have not had access to these data. Results could greatly improve models used to inform management strategies.

Evaluation	Concept	Notes
Investigate the effects of reduced transportation rates on Snake River steelhead and spring Chinook Salmon Cost: \$30k Timeline: 9 months	Spillway and barge loading PIT detection capabilities allows researchers to better understand how increased spill reduces transportation rates and decreases survival.	Transportation rates have decreased by an order of magnitude under increased spill, greatly reducing the efficacy of the juvenile transportation program.
Document trends in fallback rates of adult salmonids at CRS projects Cost: \$30k Timeline: 6 months	Analyzing trends in fallback rates of PIT-tagged adult Chinook Salmon and steelhead by project and operations could provide valuable insights on potential unintended consequences.	Fallback of adult salmonids has negative effects on the reproductive migration. NOAA is supportive of further investigations on this topic.
Updated bibliography on total dissolved gas and effects on aquatic organisms Cost: \$10k Timeline: 3 months	Relevant research in recent years could build upon previous reviews on the topic (Weitkamp and Katz 1980; Transactions of the American Fisheries Society, 109(6), 659-702).	A literature review would require minimal effort and provide an update to the existing body of knowledge on TDG and its effects on aquatic species.