



July 11, 2022

The Honorable Patty Murray
United States Senate
154 Russell Senate Office Building
Washington, D.C. 20510

The Honorable Jay Inslee
Governor, State of Washington
P.O. Box 40002
Olympia, WA 98504

Dear Senator Murray and Governor Inslee:

Thank you for the opportunity to comment on the Draft Lower Snake River Dams Benefit Replacement Study (Draft) released by your offices on June 9, 2022. Representing the region's not-for-profit, community-owned electric utilities, Northwest RiverPartners (NWRP) has sought to be an active participant in the dialogue regarding the potential breaching of the four federally owned and operated dams on the lower Snake River.

NWRP's mission is to lead the charge for the Northwest to realize its clean energy potential with hydroelectricity as the cornerstone. Core to fulfilling this mission are our efforts to develop and deploy strategies that fight climate change through the transition to clean energy and transportation; restore healthy fish populations in Northwest rivers; include vulnerable communities in the region's clean energy future; and maintain an affordable, dependable electric grid. Each of these four components are necessary in promoting a more equitable grid reflective of Northwest values.

As representatives of the people working day and night to keep the lights on for millions of your constituents, it is these metrics we use to measure the relative merits of energy policy initiatives, including proposals to breach the lower Snake River dams (LSRD). It is why on both February 11, 2022 and May 6, 2022 we co-authored correspondence detailing scope and substantive components that we felt would be necessary for a thoroughly informed analysis of the potential impacts of breaching the LSRD. In those correspondences we noted, with concern, that absent additional elements, the initial scope of the proposed analysis could not properly evaluate all of the factors necessary to inform policy decisions regarding something so serious as removing federal infrastructure on which our region and communities have come to rely.

NWRP shares the goals and values of returning healthy salmon runs to the region that meet the trust responsibilities for Native American Tribes and achieve longevity for our region's iconic



fish. Where we may differ, however, is on what the scientific evidence suggests are the environmental factors most attributable to the struggle of salmon on the Snake River and throughout the Pacific Rim and what those factors mean for directing the best use of finite resources to achieve salmon recovery.

On October 20, 1999, several advocacy groups (the Sierra Club, Trout Unlimited, National Wildlife Federation, American Rivers, & etc.) published a “timeline to extinction” in a full-page advertisement in *The New York Times*, with the statement that if the lower Snake River dams were not promptly removed “wild Snake River spring chinook salmon, once the largest run of its kind in the world, will be extinct by 2017.” It’s now 2022 and the wild Snake River spring Chinook salmon are still here, albeit on a precarious path to recovery.

What has happened in the interim is that fish passage system investments have resulted in juvenile fish survival rates of 95% - 98% past each of the LSRD. These investments have resulted in a smolt-to-adult return rate on the portions of the Snake River still accessible to fish that are in alignment with the smolt-to-adult return rate on undammed rivers within the region.¹ Meanwhile, human activity across the globe has pumped billions more tons of GHG emissions into the earth’s atmosphere leading National Oceanic and Atmospheric Administration (NOAA) scientists to conclude that “with a warming climate, deterministic declines inevitably lead to extinction [of Chinook salmon] unless some ecological, evolutionary, or climatic rescue effect occurs.”²

Rescue efforts for salmon, therefore, must start with decarbonizing our energy grid and the rest of our economy. All credible analyses, including one recently commissioned by NWRP, underscore that there is no way to replace the reliable power the dams provide, given current technologies and timeframes, without burning more fossil fuels and adding millions of metric tons of CO₂ to the atmosphere.

The Draft touched on some of the costs associated with breaching the LSRD, including the loss of:

- up to 3,400 MW of clean power production
- irrigation for 50,000 acres of high value agriculture

¹ NW RiverPartners website: [Northwest RiverPartners - Northwest RiverPartners \(nwriverpartners.org\)](http://nwriverpartners.org)

² “Climate change threatens Chinook salmon throughout their life cycle” by Lisa G. Crozier (NOAA Fisheries), Brian J. Burke (NOAA Fisheries), Brandon E. Chasco (NOAA Fisheries), Daniel L. Widener (Ocean Associates – under contract to NOAA Fisheries) & Richard W. Zabel (NOAA Fisheries). February 18, 2021.

<https://www.nature.com/articles/s42003-021-01734-w>



- barge transportation that contributes to the third largest grain export corridor in the world³
- the region's burgeoning river cruise industry
- recreation and other tourism on which communities have been built

Surprisingly, however, the Draft ignores the scant likelihood of replacing these “services,” given the difficulty of siting and building new infrastructure in sensitive ecological areas. As an example, some of the same groups that have advocated for LSRD removal have also objected to the construction of new resources that could be used to help mitigate their loss such as a new pumped storage facility in Goldendale, Washington⁴, solar power generation facilities⁵, or small modular reactors at the Hanford Nuclear Reservation.⁶

Furthermore, in our correspondence and our meeting with the consultants, we communicated concerns about the Draft’s baseline assumptions, deference to unvalidated cost estimates, underestimation of infrastructure mitigation, impacts to grid reliability, increased costs to ratepayers, and the increase in GHG emissions necessary for modified energy production. Unfortunately, many of these concerns were not reflected in the Draft. The most notable omissions are listed below:

The Draft fundamentally misunderstands the requirements of maintaining a reliable, low-cost electric grid in the context of the region’s clean energy laws.

The Draft assumes a diminished importance of the LSRD in a zero-carbon future, however, the exact opposite is the case. In a future with fewer on-demand resources and exponentially more intermittent generation, the LSRD’s ability to provide non-emitting power, on-demand, will become increasingly critical to maintaining a reliable grid and ensuring public safety under extreme weather conditions.

In our pre-Draft comments, we cited the 2018 and 2019 studies prepared by Energy+Environmental Economics (E3) as evidence of the challenge of maintaining grid reliability in a CO₂-free future. The Draft references these reports but assigns more weight to those put forward by the Northwest Energy Coalition (NWEC), an organization promoting breach. The weighting of the NWEC-commissioned studies seemed especially

³ United States Department of Agriculture, “[Barge Dashboard](#)”

⁴ <https://www.sierraclub.org/washington/blog/2020/10/oppose-proposed-goldendale-pump-storage-project-along-columbia-river>

⁵ <https://www.seattletimes.com/seattle-news/environment/conflicts-escalate-amid-surge-in-wa-solar-farm-proposals/>

⁶ <https://energycentral.com/news/proposed-washington-nuclear-reactor-site-draws-fire-local-tribes>



out of place because both studies looked at LSRD replacement in a vacuum, without modeling the requirements of the grid in a zero-carbon future. As an example, neither NWEC study actually replaced the full physical generating and storage capabilities of the dams. Instead, they both relied on hypothetical market purchases to meet grid reliability needs. This may be a convenient theoretical convention for arriving at a lower cost, but the reality is, without the LSRD in place, it is very unlikely surplus power will be available during the hours it is most needed (i.e., during extreme weather events).

Very recently, NWRP announced the results of the attached study completed by Energy GPS regarding the full power cost replacement of the LSRD.⁷ This study modeled the entire Western Electricity Coordinating Council's footprint, including each state's clean energy laws. The study then isolated the impacts on the Western Power Pool (WPP, formerly Northwest Power Pool), which is the North American Energy Reliability Corporation's (NERC) designated subregion that encompasses Washington and Oregon. The study compared the generating requirements and costs of fulfilling the respective states' clean energy laws with and without the LSRD in place. The difference between the two model runs represents the incremental costs of replacing the LSRD generating capabilities. This current and comprehensive analysis concluded:

- Existing WPP electric sector decarbonization laws require an unprecedented buildout of 160,000 MW of new resources by 2045, with a cost of \$142 billion *if* the LSRD remain operational.
- The replacement of LSRD power generation capacity would require an *additional* 14,900 MW of new resources (i.e., wind, solar, storage, and demand response) at an *incremental* cost of \$15 billion (Net Present Value).
- The more on-demand generation the region loses (i.e., coal, natural gas, hydro, nuclear), the more variable generation (solar/wind) plus storage (batteries/pumped storage) must be built to ensure sufficient generation is always available.
- The overbuild of renewables is not useful in many parts of the year and, by 2045, 35% of the annual energy from renewable resources is unusable and is curtailed.

We are also aware of a study commissioned by the Bonneville Power Administration (BPA), the not-for-profit federal administration within the U.S. Department of Energy responsible for marketing and transmitting power from the Federal Columbia River Power System. The BPA-commissioned analysis also examines the potential impacts of the removal of the LSRD in the context of clean energy laws. As a result, while the BPA analysis has yet to be released publicly, we are confident that when it is released, it will

⁷ Northwest RiverPartners, Energy GPS, LLC, "[Lower Snake River Dams Power Supply Replacement Analysis](#)"



confirm that replacing the LSRD comes at a substantial cost, even assuming emerging technologies are available.

Furthermore, the Draft specifically states “...in addition to evaluating a one-to-one replacement portfolio, an option for replacing the energy attributes of the LSRD should be evaluated that optimizes the ability to meet the Pacific Northwest region’s current and future needs, not just what the LSRD currently provide and when they provide it.” We agree and request the Energy GPS analysis and the BPA-commissioned study, when available, be used to fulfill this role in your final report.

The Draft fails to analyze the energy-related CO₂ implications of removing the LSRD.

We are highly concerned the Draft fails to provide any real examination of the energy-related CO₂ emissions implications of removing the power generated by the LSRD. The entirety of the coverage it gives to the climate change implications related to power supply is included in one paragraph on page 65:

If the replacement portfolio is not in place, the Pacific Northwest region would experience increased challenges. These include the reduction in peaking capacity, risk of congested transmission lines, particularly near the Tri-Cities, increased power rates, and potential increases in carbon emissions due to increased emitting generation to compensate for the loss in capacity. However, if the alternatives for replacing the power are operating before breaching occurred, these impacts are not likely. [emphasis added]

With Washington and Oregon both enacting highly aggressive decarbonization laws, it is astonishing the Draft omits any analysis of the impact of CO₂ with the loss of this non-emitting resource on meeting the decarbonization requirements. The loss of the LSRD most certainly will delay the completion for a zero-carbon grid by years and will add millions of tons of emissions into the atmosphere.

Given existing technologies and required timeframes, the only way to replace the non-emitting power and reliability the LSRD provide is to burn more coal or natural gas. The 2020 Columbia River System Operations Final Environmental Impact Statement (CRSO EIS) concluded that even a carbon-free portfolio of wind and solar power plus batteries would increase the region’s carbon footprint by 1.3 million metric tons per year, as



existing fossil fueled plants would be more heavily relied upon to maintain grid reliability.⁸

Similarly, the Energy GPS study determined that, given the unprecedented buildout of renewable energy resources needed to decarbonize the grid, losing the non-emitting LSRD will inevitably force grid operators to run coal or natural gas generation more frequently and for a longer period of time. Doing so threatens the ability of electric utilities to achieve clean energy mandates.

Also contained in the Energy GPS report is a thorough review of dam removal in the context of historic renewable buildouts. The report found:

- It is unlikely that state decarbonization requirements are met until 2076, even if the WPP *doubles* its historic pace of renewable buildout, causing emissions in the Pacific Northwest to increase by 132 million metric tons (MMT) of CO₂ to maintain grid reliability.
- Removing LSRD capacity puts further stress on the ability to achieve state policy mandates, likely adding an additional 5 MMT – 8.5 MMT of CO₂ released into the atmosphere.⁹

In order to retain basic reliability standards, every credible analysis indicates GHG emissions will increase under any breach scenario, absent the application of an undefined resource that is not yet commercially available. As noted above, deployment of both mature and emerging generation technologies is speculative, at best, given well documented opposition.

Given the significant and mounting evidence of the negative impacts of climate change on salmon abundance and recovery throughout the Pacific rim, it is essential that any effort charged with analyzing whether “there are reasonable means for replacing the services and benefits provided by the lower Snake River dams,” as the Lower Snake River Dams Benefit Replacement Report is chartered to do, must include an analysis of impacts to GHG emissions. The charter of the Benefit Replacement Report further states that “the process will build on previously conducted research,” but there is no evidence

⁸ Columbia River System Operations Environmental Impact Statement, Chapter 3, Affected Environment and Environmental Consequences: [Columbia River System Operations Environmental Impact Statement - Chapter 3 \(bpa.gov\)](http://www.bpa.gov/crosis/)

⁹ Northwest RiverPartners, Energy GPS, LLC, “[Lower Snake River Dams Power Supply Replacement Analysis](#)”



the Draft considered prior credible examination of the impact of LSRD removal on GHG emissions.

We respectfully request that the GHG emissions impacts of LSRD removal be included in the Final report as multiple, credible sources of this data are available.

The Draft fails to address public safety issues due to climate change and higher costs in the context of other inflationary pressures.

As noted previously, the LSRD are critical to providing reliable, non-emitting power when wind and solar are not available. As we retire firm resources that provide power on demand, like coal and natural gas, the LSRD will become increasingly important to fill in the gaps as more wind and solar power come online.

This is particularly important as climate change results in a greater frequency of potentially life-threatening weather events. The LSRD are crucial to avoiding blackouts during heat waves and cold snaps.

As a very recent example, the 2021 heat dome killed over 500 Pacific Northwest residents. The LSRD kept the power running for hundreds of thousands of Northwest residents¹⁰, which likely prevented many more deaths. The 2020 CRSO EIS concluded that losing the LSRD could double the region's likelihood of blackouts, yet the Draft fails to adequately address the probability of significant power loss.

Removing the LSRD will raise electricity costs for customers by billions of dollars. The Draft report also omits any mention of the 2020 CRSO EIS estimated rate increases which would be caused by breaching the LSRD. Approximately 10% of the population in Washington state live below the poverty line. At a time of economic upheaval because of the pandemic and unrelenting inflation this impact should be given more consideration in the final report.

The Draft lacks detail and accountability regarding replacement infrastructure.

As we noted in our May 6, 2022 correspondence, we remain concerned that infrastructure needs and requirements be fully vetted before removal even be considered. Issues such as procedural requirements, National Environmental Policy Act, Administrative Procedures

¹⁰ BPA Presse Release: "Lower Snake River dams help region power through recent heatwave, Ice Harbor key to relieving transmission congestion in Tri-Cities" July 22, 2021: [News Release Template \(bpa.gov\)](https://www.bpa.gov/news-releases/2021/july/22/lower-snake-river-dams-help-region-power-through-recent-heatwave-ice-harbor-key-to-relieving-transmission-congestion-in-tri-cities)



Act, and numerous other federal, state, and local regulations and ordinances would have to be considered in order to ascertain the true cost of removal.

Instead, the Draft has numerous sections where the realized cost for infrastructure is either guesstimated or essentially dismissed by assuming the mitigation would occur after the fact. It states, “In describing how services and benefits might be replaced, this report assumes that replacement actions would be in place before dam breaching so there is no loss of benefits. In specific instances where actions cannot be implemented in advance, mitigation measures would be needed during a transition period.”

It is clear there is a direct conflict between these two contiguous sentences. Either the replacement resources have to be in place, or they don’t. We pointed out this apparent contradiction in our prior correspondence because it is so critical to the Draft’s conclusion. In essence, the “mitigation measures” caveat allows the Draft to conclude the services provided by the dams can be replaced, because there is no accountability to ensure the replacement infrastructure is built in time.

The Final report should make clear whether replacement resources are required to be in place or not prior to removal; “maybe” or ambiguous narrative that effectively has that meaning is not a standard the public or policymakers should reasonably rely upon in making a decision that affects so many people across such a broad geographic footprint.

The Final report needs to be clear and definitive on whether full replacement infrastructure needs to be in place or not prior to a potential LSRD removal,

The Draft makes unwarranted, pessimistic assumptions and unrelated comparisons about hydropower.

The Draft speculates the hydropower system will be more constrained by court rulings and treats that speculation as fact.

The Draft also contends climate change will limit the dams, despite the fact the University of Washington Climate Impacts Group has forecast regional precipitation quantities will remain about the same.¹¹ So while the Draft does not address how climate change is also impacting salmon in the ocean, it does utilize climate change as theoretical constraint on the system.

¹¹ University of Washington, College of the Environment, “How climate change will impact outdoor recreation in the Pacific Northwest”; <https://environment.uw.edu/news/2022/05/how-climate-change-will-impact-recreation-in-the-pacific-northwest/>



We also disagree the situation in the Klamath Basin can be compared to the LSRD. The Klamath Basin projects were created for agriculture and not federally authorized for transportation, the Klamath Hydroelectric Project in total amounts to a fraction of the power generated by the LSRD at only 169 MW, and the project owners, PacifiCorp, is an investor-owned utility.¹² Finally, the Klamath Basin dams do not have fish passage, whereas the LSRD have some of the most advanced fish passage systems in the world. It is truly an apples and oranges comparison that has no place in this Draft.

We are disappointed by the fact that the Draft includes an unsubstantiated reference to methane produced by the LSRD under the section titled, “Carbon-free energy.” In this section, the report states, “[The Lower Snake River Dams] emit an estimated 86,000 MT of CO₂e annually.” However, the calculations used to yield this estimation are not included in the Draft, and further investigation into the cited works also do not directly state how this estimation was determined.

The Draft does cite the study titled, *Methane Ebullition in Temperate Hydropower Reservoirs and Implications for US Policy on Greenhouse Gas Emissions*¹³. This study measures ebullitive and diffusive methane fluxes from two eastern Washington reservoirs, including the Lower Monumental Reservoir on the Snake River. The reservoir was sampled for CH₄ ebullition during a single, September (summer) 2012 sampling campaign, which used four submerged inverted funnels to determine the rate of ebullition.

While the study does include this estimate for the CH₄ ebullition rate, it does not include a recommended methodology to determine the CO₂e for the four Lower Snake River Dams. Therefore, from the information presented in the draft report, it is unclear how the 86,000 MT CO₂e figure was obtained.

A theoretical calculation of 86,000 MT CO₂e was published by a dam-breaching proponent group known as DamSense¹⁴, however the overall methodology of the DamSense calculation raises significant concerns. Firstly, a foundational component in determining the CO₂e for the four lower Snake River Dams is the ebullition rates from

¹² PacifiCorp, Klamath Hydroelectric Project; <https://www.pacificorp.com/energy/hydro/klamath-river.html>

¹³ Miller, Benjamin et al. “Methane Ebullition in Temperate Hydropower Reservoirs and Implications for US Policy on Greenhouse Gas Emissions,” Environmental Management, vol. 60 p: 615-629. 2017.

¹⁴ Twa, John. “An Update to the 2016 Paper, ‘The Lower Snake River Reservoirs Generate Significant Amounts of Methane, a Potent Greenhouse Gas’,” DamSense.



the study noted above. However, these rates were measured from very few data points, which limits the accuracy of the estimation.

The calculated ebullition rate was determined from only four samples. These samples were taken only at Lower Monumental reservoir and were only taken on one day in the summer. The study itself states, “The scope of this study is limited due to sampling during the daytime and temperate summer only.”

Additionally, the methodology DamSense implemented is based on the findings of the study titled, *Evaluating Greenhouse Gas Emissions from Hydropower Complexes on Large Rivers in Eastern Washington*.¹⁵ This study itself states, “Our investigation was considered preliminary and not designed in order to estimate reservoir wide greenhouse gas emissions via the ebullition pathway; the intent was to determine whether substantial quantities of CH₄ were escaping via ebullition from shallow, littoral embayments within the reservoirs we studied.”

Furthermore, to find the true value of CO₂e from the Lower Snake River Dams, the measurement should have been compared to a modeled scenario in which the dams were not present. Although the emissions of a free-flowing river scenario are less, the two studies mentioned above indicate that a free-flowing scenario would have some emissions of CH₄. Thus, to accurately state the CO₂e attributed to the dams, the net value between the CO₂e from the current scenario of four dams along the lower Snake River and the CO₂e from the lower Snake River without the dams should have been used.

In short, it is truly concerning that the Draft would include an unattributed CO₂e value for the LSRD. It is even more disturbing in light of the fact the Draft doesn’t mention that potential replacement resources, such as wind and solar power, also have carbon footprints as part of their respective lifecycles. There are other social and environmental ills associated with the manufacture and deployment of alternative generation technologies.¹⁶ This is not to argue against their deployment, but rather that the ”true” cost of alternatives should be transparent and available.

Accordingly, we ask that the CO₂e reference for the LSRD be stricken from the final report. Alternatively, the final report should include lifecycle CO₂e values and reference to the other environmental and social impacts associated with all potential replacement technologies.

¹⁵ Amtzen, EV. “Evaluating Greenhouse Gas Emissions from Hydropower Complexes on Large Rivers in Eastern Washington,” Pacific Northwest National Laboratory. March 2013.

¹⁶ <https://hir.harvard.edu/not-so-green-technology-the-complicated-legacy-of-rare-earth-mining/>



The draft fails to address impacts outside of Washington state.

While we appreciate that the Draft is in response to a request from Washington state policymakers, the LSRD are Congressionally authorized projects serving a federal purpose. Much like rivers know no boundaries, the impacts of breaching the LSRD are not contained within the borders of Washington state. BPA provides energy to utilities in Washington, Oregon, Idaho and Montana and throughout the Western Electricity Coordinating Council's footprint. Grain from other states is shipped through the LSRD's locks. Food produced on land irrigated from their waters helps feed the world. Communities have come to rely on river levels for tourism, recreation, and municipal water needs.

These entities, both within and outside Washington state, count on the safety and reliability of the non-emitting power supplied and other services supplied by the LSRD. In assembling the Draft, it appears that minimal effort was made to engage regional stakeholders beyond Washington state to ascertain the impacts of LSRD removal.

One of the consequences of the pandemic is utilities have historically high accounts in arrears.¹⁷ These customers are struggling to make ends meet and the economic hardships many families are experiencing as a result of inflationary pressures is making their struggle even harder. Part of the mission of our public utilities is to keep rates as low as possible. How the utilities in Oregon, Idaho and Montana address the potential loss of the LSRD and the impacts it would have on the communities they serve is equally important. The Draft's stated purpose of determining "...whether there are reasonable means for replacing the services and benefits provided by the lower Snake River dams" is attributable to all the communities served by the LSRD.

The lack of outreach beyond Washington indicates to my member utilities and other stakeholders that the federal purposes for which the LSRD were built are not relevant in determining their value. We think this should be corrected in the final report by engaging and incorporating input from affected communities outside of Washington state.

The Draft fails to question the likely effectiveness of dam breaching for salmon recovery in light of coastwide declines in Chinook salmon stocks.

¹⁷ KHOU-11, ["Thousands of Washingtonians face unpaid utility bills as state moratorium ends"](#), Sept. 30, 2021



Undertaking dam breaching and the risks it presents to grid reliability, decarbonization mandates, and customer costs is unreasonable, given the lack of clear scientific evidence that doing so would achieve the desired results for salmon. The Draft seemingly takes Snake River salmon recovery as a matter of faith if the LSRD are breached. However, in light of recent studies by NOAA Fisheries¹⁸ and Dr. David Welch¹⁹ related to the threat of warming ocean conditions leading to possible salmon extinction, it is highly uncertain that breaching the LSRD would recover Snake River salmon stocks. In fact, due to increased GHG emissions resulting from their removal could contribute to salmon extinction.

The final report should incorporate available analysis on the impacts of climate change on salmon abundance and recovery.

Conclusion

We appreciate the difficulty of incorporating the many complexities of LSRD replacement into a single report. However, we are sincerely concerned by the lack of scientific rigor applied to the Draft, the major issues that were missed or misrepresented, and the overall method of economic analysis employed.

There are significant considerations that must be included in the final report in order for the region's policymakers to have a reasonable understanding of what is really at stake in terms of climate goals, public safety concerns, and energy equity issues. The impacts to the general public are great and they, too, deserve a thorough analysis.

Again, we do not dispute the relevance and future of salmon in the Pacific Northwest, but with finite resources and so much hanging in the balance, a transparent process with a comprehensive analysis is the only way to finalize a responsible report that properly evaluates the importance of the LSRD.

I look forward to our continued work together on this issue of extreme significance to our region.

Sincerely,

A handwritten signature in black ink, appearing to read "Kurt W. Mix".

¹⁸ <https://www.nature.com/articles/s42003-021-01734-w>

¹⁹ <https://onlinelibrary.wiley.com/doi/10.1111/faf.12514>



Kurt Miller
Executive Director
Northwest RiverPartners

Attachment