

# *Restoring the Lower Snake River*

---

Policy & Implementation  
Anthology



DamSense is a coalition of diverse interests—anglers, recreationists, engineers, families, businesses and economists—advocating for fact-based, economically sensible use of the lower Snake River. We are a force for truth and a catalyst for change, and we hold local, state, and federal government agencies accountable for serving the public interest and protecting the public purse.

We support revitalizing local economies, sustaining natural resources, preventing extinction of iconic Northwest species, and returning the lower Snake River to its rightful owners: Native American people.

"The four lower Snake River dams are man-made structures with a finite lifetime. They are part of the problematic aging U.S. infrastructure which requires more money for maintenance each year. Although these dams will be breached in the future, they are economically unsustainable today. It's simply a matter of time before the responsible federal agencies admit it. So, the question is, when the dams come down, will the salmon and Southern Resident Killer Whales still be with us? Extinction is forever; dams are not."

~DamSense

"We are all intricately connected, from tiny plankton to forage fish, salmon, orcas, tall firs and cedars, mountains, rivers, and the ocean. It is time to reflect, to reconnect, and to respond as better caretakers of our planet."

~Susan Berta Orca Network

# Policy & Implementation Anthology

## *Table of Contents*

1. The State of the Snake, 2018
2. Breaching the Lower Snake River Dams Timeline Graphic
3. Breach the Lower Snake River Dams Petition
4. Five Means Summary Graphic
5. Five Means to Breach the Four Lower Snake River Dams
6. Letter to Eastern Washington
7. Response from Jo-Ellen Darcy, Assistant Secretary of the Army (Civil Works)
8. Sierra Club E-mail 2016
9. Newspaper Ads in Washington State
10. Sierra Club Washington Chapter response to DamSense Ads
11. Stakeholder Outreach Timeline

## Forward

After a 35-year career as a Civil Engineer with the U.S. Army Corps of Engineers (the Corps), I began dedicating my retirement time and energy to reviewing the government documents related to the biological and economic reasons for breaching the 4 lower Snake River Dams (4LSRD) in eastern Washington. The Corps' 2002 lower Snake River Feasibility Report and Environmental Impact Statement (EIS) is the major source document I studied. The 5,000 page EIS, which is the product of a seven year \$33 million study, offers four alternatives from which to choose the most reasonable and prudent method to improve juvenile salmon passage over the 4LSRD. Of the four alternatives, do nothing to the dams was determined to be slightly better than either of the two non-breach alternatives: (1) transporting juveniles fish around the dams in barges and (2) building additional fish passage systems at the dams. Even though not selected, breaching the earthen berms to by-pass natural river flow around the remaining concrete structure was and still is the environmentally preferred alternative. However, this fourth alternative was deemed to be "not necessary at this time." Consequently, the two non-breach alternatives were implemented at what has added up to at least \$1 billion.

Over the past five years, I've dedicated myself to in depth comprehensive research into biological, economic, and policy data in order to understand, correct, and update the 2002 EIS and other government documents with well researched comprehensive data. These corrections and updates repeatedly reveal breaching as the only viable solution to save money, salmon, and orca. I welcome every opportunity to share my research in order to inform and educate agency officials, elected leaders, non-government organizations, media outlets, and the general public. The informal citizen-scientist DamSense team has joined forces to support revealing the unvarnished truth about an ecosystem devastated by fish killing dams. The 1970s dam builder promise that dams and wild fish could harmoniously coexist has proven to be a billion dollar fantasy.

I agree with other Corps retirees and employees that the Corps' 2002 EIS, after a few minor updates, will provide adequate operational instruction to remove the earthen berms from the 4LSRD. This initial step to restoring the Snake River watershed's ecosystem can be accomplished in a matter of months with the right political will and support. Using the 2002 EIS's substantial body of operational guidance supporting a decision by the Corps and Bonneville Power Administration to immediately breach the 4LSRD is at the foundation of DamSense. To alleviate the threat of extinction, Pacific Northwest endangered Snake River salmon and Southern Resident Killer Whales depend on achieving this goal.

Documents in this anthology were created or chosen for inclusion by a diverse group of men and women that includes fisherman, economists, federal employees and retirees, environmentalists, scientists, politicians, Tribal members, and various business entity personnel. I hope this anthology provides you with a basic understanding of how the lower Snake River watershed ecosystem can and must be set on a path of restoration this year.

I greatly appreciate the dedicated DamSense volunteers and staff who stay passionately involved with supporting the DamSense goal. Thank you DamSense team for countless hours of work, impeccable attention to detail, and a deep seated commitment to restoring a free flowing Snake River.

Jim Waddell,  
Civil Engineer, PE USACE Retired  
January 2019



# The 2018 “State of the Snake”

In 2018 the fish returns at Lower Granite dam are **down for all categories** compared to both the 10-year average, 2017, and 2016. A **total of 55,364 Chinook salmon and 53, 136 steelhead returned** to Lower Granite Dam in 2018. These precipitous declines should come as no surprise. They were predicted in the 2015 Salmon White Paper (see Damsense.org, reports page) which was distributed to Pacific NW state representatives as well as federal agency representatives.

Five-year reviews by NOAA show *minimal improvement* in the risk-status of ESA-listed salmon and steelhead despite a billion taxpayer dollars being spent on system improvements. Current NOAA recovery plans are predicted to NOT achieve fish recovery. Pacific NW state fisheries reports show that smolt-to-adult ratios have not improved either and still show Snake River fish returns are not meeting criteria for species survival.

Lower Granite Dam			
	Compared to 10yr Average		
Fish Returns	2016	2017	2018
Spring Chinook	+6%	-56%	-50%
Summer Chinook	-28%	-48%	-58%
Fall Chinook	+6%	-35%	-54%
Sockeye	-21%	-80%	-76%
Steelhead	-42%	-54%	-67%
Wild Steelhead	-47%	-67%	-72%

Data from Columbia Research Basin, <http://www.cbr.washington.edu>

**Snake River wild steelhead are on a decline to levels not seen in 20 years.** Adult returns in 2018 will mark the third steepest 5-year trend since the 2009-2013 trend. The fourth worst 5-year trend will be from 2002-2006 adult counts. *This recent 5-year trend is so low that it will hit a trigger point in the 2014 biological opinion.* The BiOp states that the agencies must implement a solution within 12 months. However, the downward trend is not the only problem; the actual number of wild steelhead is now so low that the only solution or recovery action that can be implemented quick enough to prevent virtual extinction is the breaching alternative in the existing EIS for the 4 Lower Snake River dams.

**From both the 2016 and 2017 NOAA Recovery Plans for Snake River Spring/Summer Chinook Salmon & Snake River Steelhead, National Marine Fisheries Service, West Coast Region** “Over \$1 billion has been invested since the mid-1990s in baseline research, development, and testing of prototype improvements, and construction of new facilities and upgrades.” “NMFS estimates that recovery of the Snake River spring/summer Chinook salmon ESU and steelhead DPS, like recovery for most of the ESA-listed Pacific Northwest salmon and steelhead, **could take 50 to 100 years.**” This recovery plan contains an extensive list of actions to move the ESU and DPS towards viable status; **however, the actions will not get us to recovery.**

**From the 2016 Comparative Survival Study SAR Patterns: Snake and Mid-Columbia**

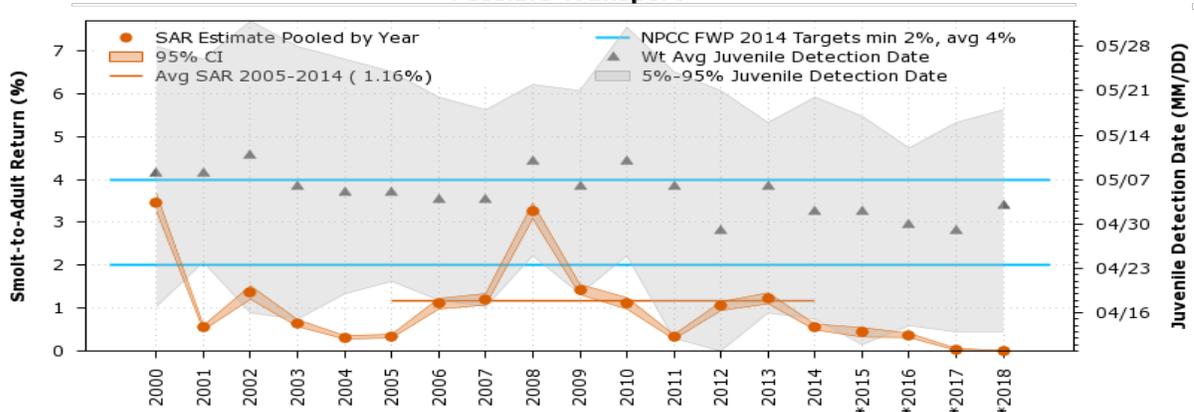
SAR (smolt to adult return ratio) is a measure of fish survival, or the % of smolts that return as spawning adults. The Northwest Power & Conservation Council's goals are **2% for mere survival of the species** and **6% for recovery of the species**. Overall, Snake River Chinook and steelhead SARs have only been above 2% in 5 of 20 years in recent history (and never above 6%). These results are in spite of increased spill and barging around the dams.

In contrast, Mid-Columbia Chinook and steelhead are generally meeting the NPCC SAR goals and have SAR ratios **2.3x – 3.4x greater than Snake River wild SARs**. Keep in mind that Snake River salmon and steelhead pass over 8 dams... 4 on the Columbia and 4 on the Snake. Mid-Columbia fish only pass 1- 4 lower Columbia dams. **If the 4 lower Snake River dams were removed, Snake River salmon and steelhead would have very similar migration and spawning conditions, which should lead to fish recovery. See charts below for trend of SAR's below 1.**

**From the Draft Comparative Survival Study 2017 Annual Report by the Fish Passage Center**

"If the lower four Snake River dams are breached and the remaining four Columbia dams operate at BiOp spill levels, we predict approximately a **2-3 fold increase in abundance** above that predicted at BiOp spill levels in an impounded system, and up to a **4 fold increase if spill is increased** to the 125% TDG limit. This analysis predicts that higher SARs and long-term abundances can be achieved by reducing powerhouse passage and water transit time, both of which are reduced by increasing spill, and reduced further when the lower four Snake River dams are breached."

**Smolt-to-Adult Return (SAR) Estimates Lower Granite (Juvenile) to Lower Granite (Adult) PIT-Tagged Snake River Spring/Summer Chinook ESU (All Only) Observed as Juvenile at Lower Granite Possible Transport**

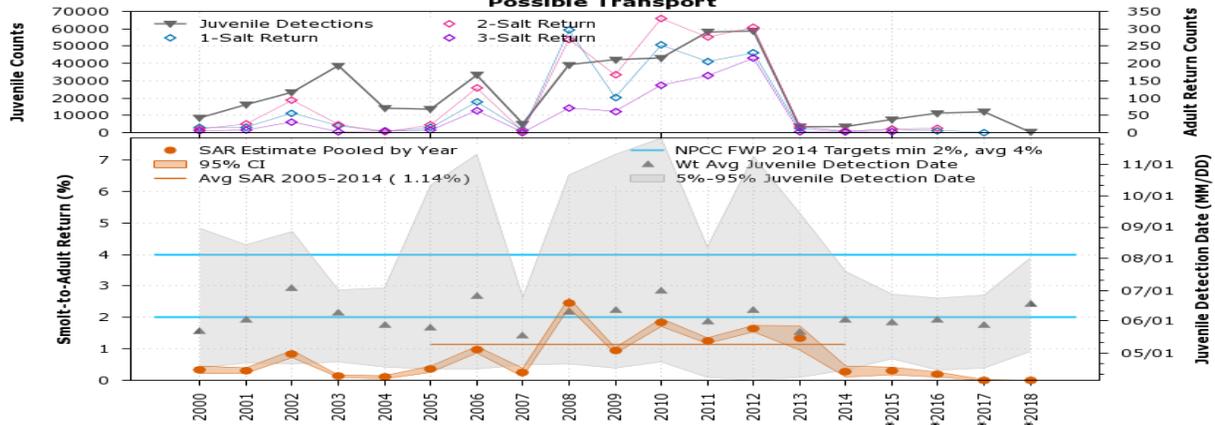


www.cbr.washington.edu/dart

\* SAR for Juvenile Detection Year may be Incomplete

27 Aug 2018 15:57:54 PDT

**Smolt-to-Adult Return (SAR) Estimates Lower Granite (Juvenile) to Lower Granite (Adult) PIT-Tagged Snake River Fall Chinook ESU (All Only) Observed as Juvenile at Lower Granite Possible Transport**



www.cbr.washington.edu/dart

\* SAR for Juvenile Detection Year may be Incomplete

21 Sep 2018 09:33:40 PDT



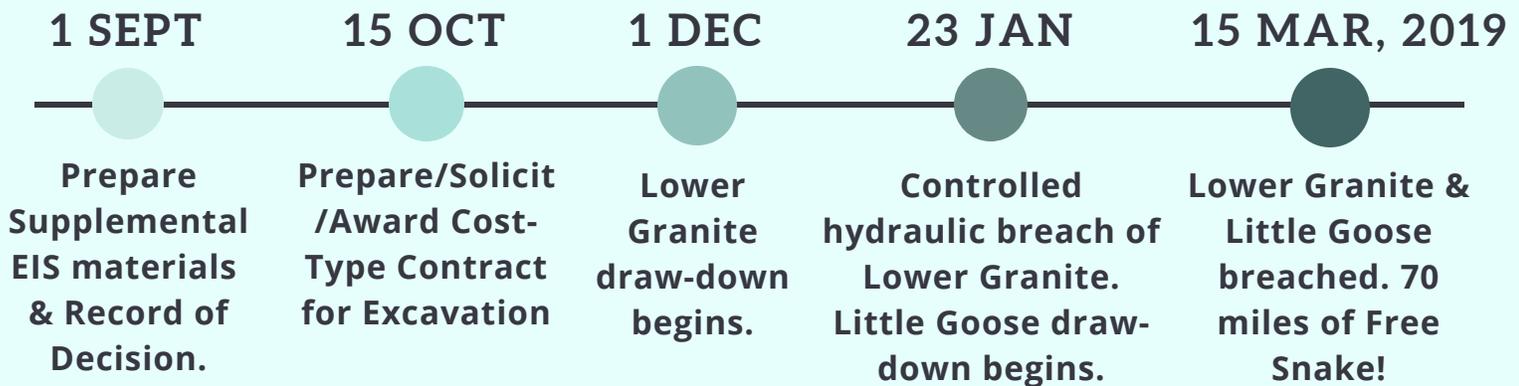
# BREACHING THE LSRDS

PICTURE FROM THE CORPS ACTIVE 2002 EIS SHOWING DAM BREACHING HAS ALREADY BEEN STUDIED

## FAST SALMON RETURNS

Each dam breached prevents the death of 2 million smolts.

### BREACHING TIMELINE- BEGINS IN 2018



### BREACH vs. REMOVAL

\$340 Million FOR ALL 4 DAMS vs. \$2 - \$3 Billion!

Simple/small size of USACE project- just remove earthen berms vs. One of the largest project they have- would remove entire structure.

Can start in December 2018 and finish by March 2020 vs. Could take years just to begin

TIME IT TAKES FOR SALMON TO BE READY FOR SRKWS VIA:

BREACHING: 14-18 MONTHS

HATCHERIES: 3-10 YEARS

*We must request Alternative 4 in the active 2002 EIS be implemented starting in December of 2018.*

*No new authorities are needed to place these dams in "non-operational" status; the Corps can do so immediately if they are asked.*



# Dammed to extinction, Southern Resident Orcas are starving. *Time is running out!*



 Dam Sense started this petition to Governor Inslee, Senator Patty Murray, and Senator Maria Cantwell

**712,093 have signed.** Let's get to  
1,000,000!



The ~~76~~ **75** remaining wild critically endangered salmon-eating Southern Resident Orcas are dying from starvation. ⇒ Leaving an effective breeding population less than 30, near the point of no recovery.

## Breach the Lower Snake River Dams in 2019



Scan the QR code to sign the petition! Use your phone's camera or download a QR reader in your app store. Or search the web for [tinyurl.com/timeisout](http://tinyurl.com/timeisout)

### **Why are these Orcas starving?**

More than 50% of their diet comes from salmon produced in the Columbia Basin, half of which were produced in the Snake River System.

### **How is dam breaching possible?**

Since 2002, the Environmental Impact Statement (EIS) has designated dam breaching as the best solution to recover wild salmon on the Snake River.

### **The Corps of Engineers can use the current EIS to breach the dams *within a few months!***

### **The Impact and benefits of breaching:**

- If the lower Snake River dams were breached, it would double or triple survival rates, restoring many millions of fish to the Columbia Basin.
- Give the orcas a fighting chance to recover by increasing their food supply.
- Breaching costs the state nothing. The first two dams can be breached for the cost of another EIS estimated at \$80 million; 5 years to completion.
- The four lower Snake River dams in Eastern Washington do not provide flood control and produce only low value surplus electricity.
- Savings from these dams can be applied to more efficient dams and/or projects.
- NOTHING else, not more spill across the dams, not more hatchery fish, not less boat traffic, not more studies and a new EIS can achieve this in time to save wild salmon or Southern Resident Orcas.

**Congressional Legislation or new appropriations are not needed to start breaching the Snake River dams this year!**

**SENATOR MURRAY AND GOVERNOR INSLEE, Please take action today and urge the Army Corps' General Semonite and Bonneville Power Administration's Elliot Mainzer to begin breaching dams in 2019.**

Thank you to the hundreds of thousands who have petitioned for immediate dam breaching, for those of you who want more information on how to save the salmon and orcas, visit [www.damsense.org](http://www.damsense.org)

View the Petition at [tinyurl.com/timeisout](http://tinyurl.com/timeisout)

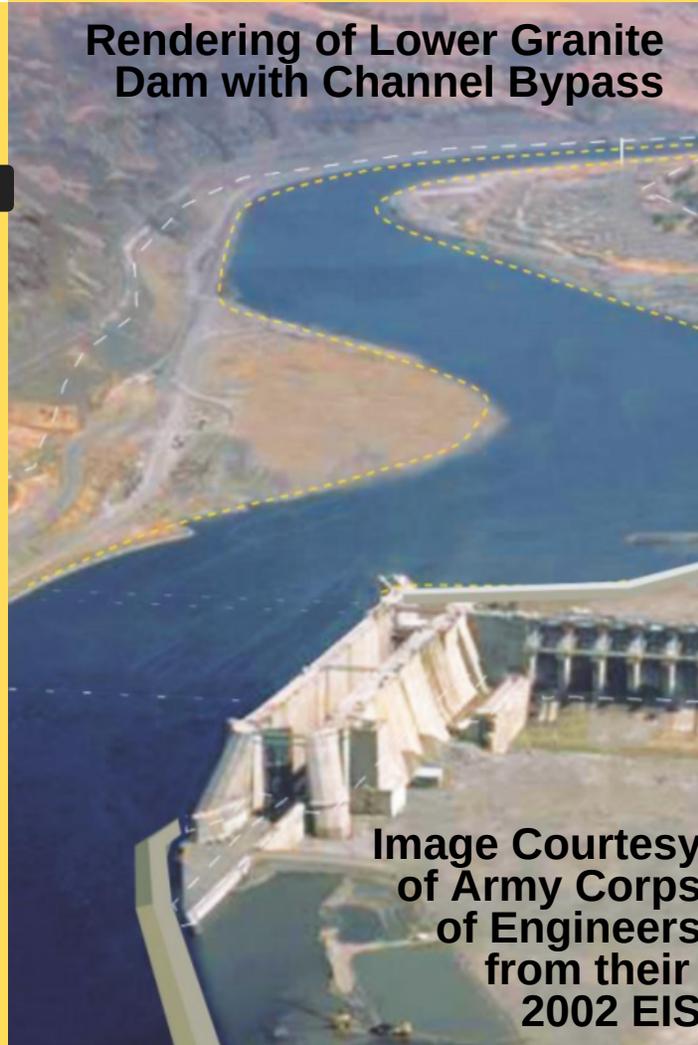


1 The Corps needs no new authorities to place the 4 LSRD's into a "non-operational" status while normative River flows are reestablished by removing the dams' earthen portions.

2 The Corps already studied dam breaching. It's Alternative 4 in the 2002 Environmental Impact Statement (EIS). If updating is necessary, the Corp can do it in 3-4 months.

3 Neither the ongoing litigation over the 2014 Federal Biological Opinion nor the Court's order for a Columbia River Systems Operation review (CRSO/EIS) constrains the Corps from breaching the dams through channel bypass now.

4 **Rendering of Lower Granite Dam with Channel Bypass**



Breaching can be financed through existing debt reduction and credits mechanisms as a fish mitigation action or direct funding by BPA. New appropriations are not necessary.

5 Breaching the 4 LSRD's is far easier than originally planned, making it possible to move from a decision to breach, to breaching in a matter of months, not years.

The CRSO/EIS is approximated at \$100M, the cost of breaching Lower Granite and Little Goose Dams.

**Image Courtesy  
of Army Corps  
of Engineers  
from their  
2002 EIS**



# 5 Means for Breaching the Lower Snake River Dams

August 2017 | Updated October 2018

All essential components leading to both a viable hydrosystem and recovery of Salmon and Steelhead in the Columbia/Snake Basin are currently available, and they would save the public a fortune.

This paper outlines five existing, essential components or “means” which the US Army Corps of Engineers (Corps) and Bonneville Power Administration (BPA) can utilize to immediately breach the four Lower Snake River Dams (LSRDs). In doing so, the Corps and BPA will avoid financial and biological losses, decrease power rates for Washington, and finally put an end to a +25 year-long debate.

While this paper describes some of the economic, financial, and biological reasons for breaching the LSRDs, its primary purpose is to show *how* (not *why*) the dams can be breached very quickly without undo fiscal hardship on any one group, such as BPA rate payers. This discussion covers multiple areas which are interconnected. A “further discussion” section follows the five-means and explores details on *why* we should breach the LSRDS.

Many government reports / documents reveal the high costs of operating and maintaining the LSRDs and the benefit of returning the lower Snake River to free-flowing conditions. More recent reports also indicate the financial and biological conditions have degraded to the point that discussing breaching the LSRDs can no longer be “kept off the table.” The fish returns<sup>1</sup> over the last three years reinforce the urgency of breaching these dams immediately.

The issue of “mothballing” units and using “disposition” studies has been discussed at BPA Federal Hydro IPR reviews as seen in the meeting notes from June 2016<sup>2</sup>. Importantly, NOAA Fisheries 2016 Proposed ESA Recovery Plan for Snake River Spring/Summer Chinook and Steelhead admits “This recovery plan contains an extensive list of actions to move the ESU and DPS towards viable status; however, **the actions will not get us to recovery.**”<sup>3</sup> Breaching was not among these options.

Immediate, collaborative action can lead to the financial and biological viability of our hydrosystem, free up government funding for other dams and habitat work, create thousands of new jobs, and likely end otherwise never-ending litigation. The five means which allow this to happen are:

1. The Corps needs **no new authorities** to place the LSRDs into a “non-operational” status while normative river flows are reestablished by removing the dams’ earthen portions.
2. The Corps’ 2002 Environmental Impact Statement<sup>4</sup> and Record of Decision provide the necessary **NEPA coverage for breaching**.
3. Neither the ongoing litigation over the 2014 Federal Biological Opinion nor the Court’s order for a new EIS constrains the Corps from breaching the dams through channel bypass now.
4. **No new appropriations are needed**. Breaching can be financed through existing debt reduction and credits mechanisms as a fish mitigation action by BPA.
5. Breaching is far easier than originally planned, making it possible to move from a decision to breach, to **breaching in a matter of months** (not years).

## Discussion of the Five Means

### **1. The Corps needs no new authorities to place the LSRDs into a “non-operational” status, while normative river flows are reestablished by removing the earthen portion of the dams.**

The Corps has a fiduciary responsibility (ultimately derived from the Public Trust Doctrine) to protect the public interest and to fund only beneficial projects. A “beneficial project” is measured by the National Economic Development benefit-to-cost ratios (BCR) as exceeding 1; meaning for every dollar spent, at least one dollar in benefit is returned. *The LSRDs have a combined BCR of 0.15:1.* This means the LSRDs are returning only 15¢ for every \$1 invested; we are losing \$0.85 for every dollar we spend. This pales to projections that a free-flowing Lower Snake River could return \$4-\$19 for every \$1 invested depending on what was done with the free-flowing river post-breaching<sup>5</sup>. This would be a BCR of 4:1 or 19:1, respectively.

Protecting the public’s interest means the Corps can place an underperforming project, such as the LSRDs, into a “caretaker” or “non-operational” status. This does not require a specific or new authorization from Congress, nor does it require that the project be “deauthorized” by Congress first. Thus, the Corps has the fiduciary responsibility to place the LSRDs into a non-operational status, based on the BCR.

Further reasoning for this is that a project “authorization” is not a mandate. Authorization provides the Corps permission to build and operate a project for specific purposes so long as that project provides economic benefit, conforms to other applicable laws and policies, and receives appropriations. When one or more of these criteria is not met, the Corps does not have permission to continue operation.

An example of placing a project into a “non-operational” status, is the Willamette Lock and Dam in Portland Oregon; placed into a non-operational status in December 2001, due to low use versus the cost of operations and maintenance<sup>6</sup>.

It is important to note that discussions surrounding the LSRDs are often referred to in terms adhering to the “purpose and needs” as authorized by Congress. This is an unnecessary argument on the part of the regional federal agencies (primarily the Corps), to say that the “purpose” of a project cannot be changed without Congressional authorization. This is true; however, placing a project into a “caretaker” or “non-operational” status does not change the purpose. Hence, *the Corps is not constrained in anyway, from considering breaching.*

Just recently, the Corps’ Northwest Division stated that a Corps engineering regulation, ER1165, provides guidance that breaching would require Congressional authorization. However, this ER’s purpose is to prevent the Corps Field Officers from changing the purpose of a project (i.e. changing the purpose from hydropower generation to flood control) or increasing the scope of a project. Placing dams into a non-operational status does neither, thus this regulation is not applicable.

### **2. The Corps’ 2002 Environmental Impact Statement and Record of Decision provide the necessary NEPA coverage for breaching, although some updating may be required.**

The 2002 Environmental Impact Statement (EIS) details breaching as a reasonable alternative. This EIS is used to this day to guide mitigation actions on the dams, as confirmed by the Assistant Secretary of the Army (Civil Works) in January 2017<sup>7</sup>. The 2002 EIS states that of the four reasonable alternatives,

breaching provides the best opportunity to recover salmon and steelhead. It also states doing nothing (Alternative 1, the “existing condition” at that time) was slightly better than “transportation” of juveniles in barges around the dams (Alternatives 2) or more “system improvements” in the form of fish bypass hardware (Alternative 3). Nevertheless, the Corps selected a modified Alternative 3, which eventually included much of Alternative 2<sup>8</sup>. Since selecting these two alternatives in 2002, the Corps has spent nearly \$1 billion on them with virtually no improvement towards salmon or steelhead recovery. This is on top of the nearly \$1 billion already spent since 1988 when the Columbia River Fish Mitigation Program (CRFM) was authorized in an effort to improve fish passage around the LSRDs and McNary Dam, with similar results.

In anticipation of the likelihood the Corps would want to, or would be pressured to, carry out Alternative 4, a group of qualified individuals have updated the 2002 EIS with the necessary data.

Over the past several years a diverse group of economic, engineering, and environmental professionals and volunteers from various technical backgrounds, including retired Corps staff (with considerable experience on the LSRDs), have reviewed, updated, and corrected much of the 3,000 pages of the 2002 EIS. In nearly all cases this work followed Corps planning guidance and used data in the EIS; or if missing, compiled it from Corps, BPA, and NOAA data and reports. This document can be found online at <http://bit.ly/BreachPlan2016>.

An estimate made by knowledgeable NEPA and planning staff with Corps’ experience, indicates that five people working full time for four to five months could complete this update on their own. Updating is also made easier since a decision to breach would be based on the fact the two non-breach alternatives of the EIS have largely failed to improve salmon / steelhead survival and initiate recovery. There is no need to update the non-breach alternatives, other than to acknowledge their inability to recover listed species and the need to move onto the remaining alternative in the 2002 EIS: breaching through channel bypass. Therefore, the most important part of the EIS to update and / or supplement is the Natural River Drawdown Engineering and Economics Appendices. These were rigorously reviewed and updated by the previously mentioned group of professionals, revealing that corrections of current costs and economics readily show additional justification for the “reasonable and prudent” use of the breach alternative.<sup>9 10</sup>

### **3. Ongoing litigation over the 2014 federal biological opinion and the Court’s order for a new EIS does not limit or constrain the Corps from acting in the meantime to accelerate salmon and steelhead recovery via breaching and channel bypass.**

A letter received from Assistant Secretary of the Army, Civil Works department in January 2017 confirms that the Court’s (Judge Simon) direction for a new and broader NEPA process is a separate action.<sup>11</sup> Meaning it does not prevent the Corps from exercising its responsibilities to comply with existing law and regulation today. In other words, the Court’s ordered EIS is not a “get out of jail free” card to avoid any action until said EIS comes out - which is probably 6-9 years away, since this new EIS will be a “programmatic” type for the entire Federal Columbia River Power System (FCRPS).

Should breaching the LSRDs be included in this new programmatic EIS and a decision be made to develop a breach plan, a second, more specific EIS would have to be prepared. By then the salmon and steelhead biological condition will have significantly degraded and the economic failures (evident but ignored today) will be painfully obvious. Thus, a new EIS would have to be started largely from scratch.

If the Corps and BPA adopt the policy approach outlined in this paper and begin breaching in the very near term (i.e. within the year), it would be up to the Court to decide what (if any) further NEPA, biological opinions, or EIS work would be necessary to satisfy the Court's intentions to address recovery of listed species. Breaching certainly would largely satisfying these goals and likely would end the litigation altogether. Furthermore, to update the current 2002 EIS and move forward with breaching as the selected alternative would not require much effort.

**4. No new appropriations are needed. Breaching can be financed through existing debt reduction and credits mechanisms as a fish mitigation action by BPA.**

This fourth means can be broken into three subtopics: BPA's fish mitigation credits, the Corps' overestimation of breaching costs, and amassed debt accumulated by previous failed attempts to recover the fish species.

First, since BPA is responsible for 92% of the cost of these four dams, BPA is responsible for at least 92% of the breach cost (92% is an average; the cost share ranges from 98.4% for Lower Granite dam to 78% for Ice Harbor dam)<sup>12</sup>. If BPA sought to pursue breaching the LSRDs as the most cost effective "fish mitigation" measure for salmon and steelhead recovery under the 1980 Power Planning and Conservation Act, BPA can book a 22% credit against the US Treasury debt on these dams. This has the added advantage of avoiding any of the appropriation and authorization conundrums involved in attempting to get Congress to act.

The second financial consideration is the cost of breaching. When originally estimated by the Corps in 1999, the cost for full dam removal was estimated to be \$1.8 billion.<sup>13</sup> That amount is often used as the basis for claiming that removal would cost \$2-\$3 billion in today's dollars. However, full dam removal was not the Corps' recommendation for the breach alternative; it was channel bypass. Channel bypass involves removing the earthen berms on all four dams and part of the natural embankment along the two lower dams. This concept restores normative flows and habitat in the entire 140 miles stretch of the lower Snake River while leaving the concrete structures intact. With channel bypass, the concrete structure stays in place, making breaching much cheaper while still satisfying all the biological and safety considerations.

In 1999, breaching through channel bypass for the LSRDs was estimated to cost \$859 million<sup>14</sup>. However, subsequent and careful review of the planning assumptions used to develop this estimate indicates many assumptions were incorrect or unnecessary and led to gross overestimates. For instance, in order to prevent \$400 thousand in rail and railroad damage, \$109 million was estimated for bank stabilization on just one reservoir. \$400 thousand was the actual cost to repair such damage after the 1992 drawdown test of Lower Granite Dam<sup>15</sup>.

A more reasonable estimate based on corrected assumptions gives an estimate of \$255 million in 1999 dollars for breaching via channel bypass<sup>16</sup>. In 2018 dollars, the cost would be about \$384 million for all LSRDs. The breach cost for the first dam, Lower Granite after taking a 22% credit, would cost only \$34 million. The next dam, Little Goose, would cost \$33 million to breach. Lower Monumental and Ice Harbor would cost \$69 and \$79 million respectively, due to the need to excavate and widen the river embankment and to relocate a rail line at Ice Harbor.

**Cost of Breaching after 22% credit (2018 dollars)**

Lower Granite	\$34 Million
Little Goose	\$33 Million
Lower Monumental	\$69 Million
Ice Harbor	\$79 Million
<b>Total</b>	<b>\$215 Million</b>

To put these costs into some perspective, the Corps will end up spending about \$120 million by the end of 2018 for juvenile fish bypass improvements just on Lower Granite dam. Of this, BPA and its ratepayers would have to repay roughly \$110 million (or 92% of the cost).

The third financial component concerns the debt and debt service resulting from these LSRDs. While BPA has been slow at paying down its debt burden, it must make timely interest payments to the US Treasury. These interest payments alone account for about 44% of BPA’s cost to operate, maintain, and repair the LSRDs and bypass systems (mitigation), and will continue to increase without debt relief<sup>17</sup>. If not already, these interest payments will soon be greater than the Operations and Maintenance costs for the dams. Hence, interest payments on debt will be the largest cost item for the ratepayers’ bill for the LSRDs.

Given the failed alternatives selected by the Corps in the 2002 EIS, and the nearly \$1 billion spent since 2000 on these failed alternatives (e.g. little or no improvements in Smolt-to-Adult Returns for salmon and steelhead), BPA ratepayers can make a good argument for not repaying this debt nor the interest bearing on it. Likewise, Corps’ CRFM expenditures prior to signing the EIS yielded few (if any) sustained recovery benefits.

Ratepayers should not be held accountable for the decisions made by the Corps, especially in light of the fact that over 80% of the individual comments to the Corps in 1999 supported dam breaching. Therefore, these expenditures also should be exempt from repayment by BPA’s ratepayers.

In addition to CRFM expenditures, to date 92% of the Corps’ Operations & Maintenance and Lower Snake River Fish and Compensation Plan expenditures add to the debt burden and interest payments. Additionally, BPA’s cost or debt that will accrue for the repair and replacement of the \$2 billion CRFM investment in the “systems improvements” that must be maintained if the LSRDs are to be kept in an operational mode, is still unaccounted for in these estimates. These repair and replacement costs are roughly 50% of the initial cost every 20 years. Those systems will cause additional fish mortality and likely will further exacerbate the Corps “jeopardy” situation under the Endangered Species Act, if not properly maintained.

Given all this, what is a fair and equitable solution to reduce this financial burden for all concerned? BPA should utilize the existing 4(h)(10)(C) credits of the 1980 Power Planning and Conservation Act<sup>18</sup>, an accounting mechanism for “fish credits” for the \$384 million breach cost. To have ratepayers cover the cost of breaching because of failed mitigation efforts by the Corps is onerous. While this author has not been able to ascertain the total debt already on the books at BPA for the LSRDs, it is likely in excess of \$2 billion (based on \$1.5 billion in CRFM debt portrayed in the BPA Focus 2028 Federal Hydro review<sup>19</sup>),

and the \$1 billion debt noted on page 12-1 in the Economics Appendix of the 2002 EIS. While these numbers are dated, a lot more debt has accumulated with little evidence of repayment. These are mostly interest payments (20% of *all* BPA interest payments for the hydrosystem), is disproportionately high for the LSRDs, since the LSRDs represent about 12% of the net hydropower generation<sup>20</sup>.

Since the breach costs would still be a fraction of the CRFM debt, further debt reduction and credits could be used by BPA to cover mitigation costs for irrigators on Ice Harbor pool (recently reengineered and estimated at \$18 million) to cover the construction of extended pump intakes, screens, additional pumps, etc. The 2002 EIS addresses this issue as an economic cost, but not necessarily a cost of breaching, since the irrigation system is not a federal system. Note, this cost was originally estimated by the Corps at \$251 million in 1998 dollars, which was more than the farmland was worth. This led 15 irrigation farmers to vehemently oppose dam breaching. The correct cost should have been around \$14 million and well within a mitigation package for BPA and the Corps. A recent report estimated cost replacements to be \$18 million in 2016 dollars.<sup>21</sup>

The 2002 EIS lists five other non-federal mitigation modifications likely required for breaching, such as water intakes and effluent diffusers for the Clear Water Paper Company in Lewiston, Idaho, but does not provide cost estimates<sup>22</sup>. By my estimates, together these modifications should not exceed \$20 million and are well within the scope of what could be covered with mitigation credits. All other mitigation associated with breaching impacts is covered in the above-estimation breach costs of \$384 million.

If this approach to financing via debt reduction were taken, taxpayers at least would benefit from increased salmon / steelhead runs. Local economies would benefit from the survival of other listed species, such as the Southern Resident Killer Whales who depend on the Chinook runs for more than 80% of their diet, a large part of which should be composed of Snake River runs. Breaching would allow for the very positive economic benefits to many communities, derived from a natural river, in terms of several thousand more agricultural, recreational, and fishing jobs, direct expenditures in the region in excess of \$700 million annually, and \$20-\$30 million in land-lease revenues per year for the Washington State School budget, should the project lands be conveyed to the State.

For those taxpayers who are also ratepayers of BPA, this approach would lessen the financial risk BPA is facing in light of \$16-\$17 billion in total debt, making them the worst public utility in the country in terms of an asset-to-debt ratio of 93% according to a BPA's budget officer<sup>23</sup>. This approach would also shift Corps and BPA funds to other projects that would benefit the environment and taxpayers far more than the existing situation.

At this point with the deteriorating and harmful LSRDs in place, BPA can only continue to raise rates, which will make the entire hydrosystem less competitive. Lowering costs has rightfully been a BPA priority for decades. However, an aging hydrosystem costs more money to operate, maintain and rehabilitate. The effects of cost-cutting have been apparent for years in lower reliability ratings, unplanned outages, fewer in-service turbines, etc. Only some significant cost reduction measure, like shutting down the LSRDs as outlined here, will keep the FCRPS a viable energy producer into the future.

##### **5. Breaching is far easier than originally planned, making it possible to move from a decision to breach, to breaching in a matter of months (not years).**

Given the relative ease of hydraulically breaching an earthen embankment, there is no need for lengthy modeling, engineering, design, or complicated and lengthy contracting. New dam-overtopping

modeling software has been developed since the 2002 EIS was drafted which allows a safe breach plan to be created quickly.

The breach itself is done in two phases:

1. First, drawdown of the reservoir begins. While this takes place, earth moving equipment (likely two D8 bulldozers and an excavator) will be cutting a notch in the earthen portion of the dam.
2. When drawdown is below the spillway crest and the notch cut to that depth, controlled hydraulic breaching will begin, which uses the turbine gates to control flow. This takes approximately 8 hours with maximum flows, not exceeding high flows normally encountered during spring runoff.

Armoring protection and other channelization work can also be accomplished with several pieces of heavy equipment. The entire “construction” effort can easily be accomplished through “Time and Materials” or rental contracts. Details to the breach approach can be found in the 18 Feb 2016 Supplement (unofficial) to Appendix D Natural River Drawdown Engineers of the 2002 EIS<sup>24</sup>, as referenced on page 3.

In short, what the Corps’ Walla Walla District originally estimated would take several years in modeling, engineering, design, and contracting and well over \$70 million, can be done in a matter of months for around \$1 million.

---

## Further Discussion

---

This dam situation is analogous to the reluctant transition from steam to diesel power which, when accomplished, became the major contributor to the resurrection of American railroads in the 20th century. The Pacific Northwest should immediately drop wasteful dams and retool the rest of the system to propel us into an age of economically and environmentally sustainable power. As further justification for this action, below are some common areas of concern.

### Fish Biology Precedence

Despite the billion of dollars spent on system improvements and billions spent on harvest, habitat, and hatchery improvements, we have not begun to move the needle closer to recovery.<sup>25</sup> Indeed, the Smolt-to-Adult Ratios (a metric used to determine recovery of a species) have been nearly 0 for the past 3 years and have never reached their required 4% in the past 20 years. NOAA Fisheries 2016 Proposed ESA Recovery Plan for Snake River Spring/Summer Chinook and Steelhead admits “This recovery plan contains an extensive list of actions to move the ESU and DPS towards viable status; however, the actions will not get us to recovery.”<sup>26</sup> Breaching is not among these options.

The biological need to accelerate fish recovery would require breaching 2 dams the first year (2019); Lower Granite and Little Goose could be breached starting in December 2019, followed by breaching one dam per year for the last two dams.

Since this paper was written, another biological irony has surfaced in the bypass system. Invasive walleyes have found the bypass system a convenient place to find and eat juvenile salmon and steelhead, and now must be fished out by hand at the rate of around 40 a day to prevent significant ESA listed fish kills.

Breaching the LSRD's would eliminate the invasive walleye and enable millions of smolts to survive the Snake River and cross the remaining dams on the Columbia River. These would grow to adults who would be more likely to make it to their historical spawning grounds in "Salmon Country" on the Snake River. This great need cannot be put off any longer.

## Spill

Over the years, studies have looked at drawing down the LSRD reservoirs to spillway crest, or below, to improve the migratory corridor and recover lost Chinook habitat. Some assume this can be achieved simply by keeping the spillway gates open and letting river-full flows pass over the spillway; often referred to as "maximum spill." However, maximum spill would have significant engineering and safety challenges.

First, since the dams would continue to be obstacles to migrating fish, maximum spill would require complete and expensive design and construction of new fish ladders. Second, the dams were designed under the assumption that the spillways would not be used continually at full-flow without interruption. Within a matter of a few years, the spillway aprons would start eroding back into the face of the dam, which would lead to undermining and eventual failure of the concrete structure. "Apron erosion" already has happened at least once on the LSRDs.

Second, drawdown to the spillway crest also would leave at least 50 miles of the 140-mile corridor in a reservoir condition. This minimizes the biological benefits and still eliminates all benefits from hydropower and navigation. In other words, there is not much point to drawdown to the spillway crest.

Likewise, to simply "mothball" the turbines without drawdown and using only spillways, would lead to catastrophic dissolved gas levels. Indeed, this was the sole reason the remaining 12 turbine units were installed in the turbine bays after completion of the dams in 1975. To avoid deadly dissolved gas levels caused by excessive flow over the spillways, it has been suggested that the turbine wells be used to convey all or part of the flows. Whether, at full pool, partial, or complete drawdown, mothballing the turbine units cannot be done without removing the turbines and making very costly modifications to the turbine wells and draft tubes. Allowing continuous flows without these modifications would impose hydrodynamic forces on the dam that would lead to structural failure. Once again, there is not much point to "mothballing" these turbines.

The most economically and biologically sound solution is to breach the LSRDs via channel bypass.

## Politics

Congressional representatives and governors are often reluctant to support deauthorizing a project for fear of being perceived as taking something away from their constituents. It is also a long held cultural (or institutional) norm for local Corps districts and divisions to ignore the economic reality of a project, and instead, go to great lengths to defend the project. (This is understandable to some degree, since the Corps district offices are trying to protect their budget and livelihood. But this does not conform to the Corps' stated values toward public service and avoiding squandering taxpayer dollars, nor does it comply with the Public Trust Doctrine.)

This leads to frequent arguments between the Senior staff in Headquarters US Army Corps of Engineers and the Assistant Secretary of the Army for Civil Works on one hand, and the Corps' field commander/staff and elected officials on the other hand. In short, there is never enough money to fund even high performing projects, and with the administration trying to further reduce the Corps' Civil

Works budget, the Corps should pay particular attention to eliminate poor performing projects in the manner proposed in this paper.

Seeing as the “needs” for these four dams never has been economically demonstrated<sup>27 28</sup>, it is high-time to move forward with breaching and improve the economic standing in eastern Washington.

### Available Funds and Lack Thereof

Many government reports together reveal both the high costs of the LSRDs, and the benefits derived from retuning the lower Snake River to a free-flowing condition. More recent reports also indicate that financial and biological conditions have degraded to the point that discussing breaching the LSRDs can no longer be “kept off the table.”

There are two areas that are lacking funds for both BPA and the Corps. The first is replacing 21 turbines that have exceeded their design life.<sup>29</sup> The reliability of these units continues to decline. Reliability is now around 75%. Currently there is at least one turbine down for major repairs at each dam. Other turbines are temporally unavailable due to various technical issues. Indeed, as an example of breakdowns plaguing these dams, last year, 5 of 6 turbines at Lower Monumental dam were down for an extended time. It appears from reviewing programming documents, that BPA has concluded the cost of replacing these units does not pencil out. Failure to replace these turbines will mean further and longer outages, further loss of revenue, and higher dissolved gas concentrations caused by additional spill that will harm fish.

Another cost-avoidance feature is the Corps’ failure to conduct “conveyance” dredging on the Lower Snake River at Lewiston, Idaho, which was conducted until 1997. Conveyance dredging is needed to remove about half of the 2 million cubic yards of material that is deposited annually in the backwater of Lower Granite reservoir. This is not the same as the dredging to maintain navigation through these same deposits but is in addition to it. Due to the lack of Navigation Program funds, and the fact that additional conveyance dredging is not needed for barge traffic to reach Lewiston, these deposits have been building up since 1997. The build-up has formed a bench-like obstruction in the Snake River which creates a backwater condition during high water events, which could overtop the levees protecting Lewiston. Therefore, the lack of necessary dredging is causing the potential for flooding in Lewiston. The risk for ratepayers will be realized when Lewiston *is* flooded, and the insurance companies come looking for the deep pockets to sue<sup>30</sup>.

Another investment area directly impacted by the failed CRFM program is habitat restoration work in the Snake River basin and indirectly in other parts of the Columbia Basin. Low escapement of adult fish above the LSRDs means fish are not there in sufficient numbers to take advantage of habitat improvements. The subsequent lack of nutrients left by the absence of adult carcasses is further reducing the habitat function. Restoration work in the rest of the Columbia Basin, coastal rivers and estuaries along the Oregon and Washington coast and the Salish Sea has been negatively impacted. This is because the failure to increase runs on the Snake River has created greater “incidental take” pressure from fishing and predation on other runs in the Pacific Northwest, thus minimizing the effects of habitat restoration in those other areas. Of course, breaching would immediately increase runs due to reduced mortality, lessen “take” on other stocks, and thus allow full benefit of habitat investments in the region.

Since BPA, State, or Tribal funded habitat restoration all have been impacted as noted above, or because funds were diverted from other habitat programs to fund the mitigation work on the LSRDs, debt reduction credits should be used to fund this much needed habitat work. The formula for doing so is beyond the scope of this paper, but some immediate compensation should be estimated no later than

the start of breaching, given the biological urgency facing the Pacific Northwest ecosystems. The timing of developing near term estimates of these credits (no more than one year), should also be a part of the renegotiation considerations for the Columbia River Accords.

Regarding Compensation Plan hatcheries, these are also in need of rehabilitation or replacement. Whether BPA or Corps funded, this will add additional cost / debt burden to BPA and its ratepayers.

For BPA, in the event of dam breaching, they should consider further debt reductions. The credit could be based on the cost difference between lost hydropower revenue and power purchases required to meet loads in BPA's balancing area. While current and projected conservation measures along with a power oversupply situation may limit the credit just described, some form of credit should be given serious consideration as a matter of compensation for debt generated by the failed CRFM program, perhaps even complete debt relief from all CRFM expenditures.

### Additional Savings

While this debate of breaching continues, the Court ordered EIS (described in Means #3) is estimated to cost is the \$80 million. Initial estimate for the new EIS (which likely will end up costing more than \$100 million). If breaching is started in 2018, at least \$120 million of these costs could be avoided - which is enough to cover the costs of breaching *three* of the four LSRDs.

Furthermore, the "needs" for these four dams never has been economically demonstrated<sup>31 32</sup>.

### Section 216 Study

When the Corps places a project into a "non-operational" status, its intent is to stop spending money on it. Therefore, the Corps must first ensure that before placing a project into a non-operational status it does not create a safety hazard, damage the environment, or become a nuisance, and that the project requires only minimal funds once it is non-operation. Breaching the earthen berm is the action which ensures the dams channel is secure.

It is the Corps' policy to conduct a disposition study for existing projects. This is done in the form of a Section 216 process and would require Congressional direction and study appropriations. However, and a critical point, disposition studies are normally done on projects that are *already* in a non-operational status. At best, this study would show that the dams would need to be placed into a non-operational status first. Or the study could spell out and request authorizing language from Congress that would allow breaching and continuation of operations appropriations prior to and during breaching, in order to place the dams into a non-operational status prior to complete disposition. If this sounds like a confusing, convoluted and contradictory use of the authorizations and appropriations process, it is - and could happen only with a very determined majority effort on the part of the federal / state agencies and Congress to breach. One could assume Congress could skip the Section 216 study process, but it doesn't simplify the conundrum noted, nor is it necessary. Thus, the most appropriate use of a Section 216 study would be in parallel to the breach process in order to determine the final disposition of lands and remaining dam structures. That is why the Corps / BPA strategy (outlined in Means #3) appears to be the only way to break out of the intractable and seemingly endless process that has been going on for at least 20 years, with no end in sight.

A final noteworthy point is a draft Section 216 study for the Willamette Lock & Dam was just completed<sup>33</sup>... 16 years after the project was placed into a non-operational status<sup>34</sup>. To follow suit with the LSRDs would be synonymous with signing a death order for the salmon and our tax money.

## References & Endnotes:

- <sup>1</sup> NOTE: As of 10 September 2017 Snake river Spring/Summer Chinook returns to Lower Granite Dam are down 55% from the 10 year average, Fall Chinook are down 60%, steelhead are down 73% and predictions for 2018 based on “jack” chinook returns looks to make it the 3rd consecutive year of plummeting returns. Source: Corps of Engineer fish ladder counts as displayed by [http://www.cbr.washington.edu/dart/query/adult\\_daily](http://www.cbr.washington.edu/dart/query/adult_daily), for each run and year. For more background as to the urgency, see the December 2015 Salmon White Paper and Surrogate Appendix, <http://www.damsense.org/wp-content/uploads/2014/12/1.Snake-River-Endangered-Salmon-White-Paper-11-4-15.pdf>, and appendix, <http://www.damsense.org/wp-content/uploads/2014/12/1.2-Appendix-1-Fall-Chinook-Surrogates.pdf>, and the White Paper on Southern Resident Killer Whales, <http://www.damsense.org/wp-content/uploads/2016/05/7.-White-Paper-Southern-Resident-Killer-Whales-2.24.16.pdf>.
- <sup>2</sup> <http://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/2016IPRDocuments/Fed%20Hydro%20IPR%20%20Notes.pdf>, page 1
- <sup>3</sup> [http://www.westcoast.fisheries.noaa.gov/publications/recovery\\_planning/salmon\\_steelhead/domains/interior\\_columbia/snake/proposed\\_snake\\_roll\\_up\\_10.25.16.pdf](http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/proposed_snake_roll_up_10.25.16.pdf), page 219
- <sup>4</sup> <http://www.nww.usace.army.mil/Library/2002-LSR-Study/>,
- <sup>5</sup> <http://www.damsense.org/wp-content/uploads/2014/12/National-Economic-Analysis-of-the-Four-Lower-Snake-River-Dams-2.16.pdf>, page 6.
- <sup>6</sup> [http://www.nwp.usace.army.mil/Portals/24/docs/locations/willamette/WFL\\_News\\_release\\_11-076.pdf](http://www.nwp.usace.army.mil/Portals/24/docs/locations/willamette/WFL_News_release_11-076.pdf),
- <sup>7</sup> <http://damsense.org/wp-content/uploads/2014/12/Waddell-Dec-w-Darcy-Letter-TO-Honorable-Michael-H-Simon-2.23.17.pdf>,
- <sup>8</sup> <http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Summary.pdf>, page 25
- <sup>9</sup> <http://www.damsense.org/wp-content/uploads/2016/05/Cost-of-Dams-Rebuttal-7-29-2015.pdf>, and, <http://www.damsense.org/wp-content/uploads/2015/07/Cost-LSR-Dams-1-1-2015F-2-vers-7-30-15.pdf>,
- <sup>10</sup> <http://www.damsense.org/wp-content/uploads/2014/12/National-Economic-Analysis-of-the-Four-Lower-Snake-River-Dams-2.16.pdf>, and <http://www.damsense.org/wp-content/uploads/2014/12/Regional-Economic-Dev-Summary-Reevaluation-Lower-Snake-Dams-22-Feb-16.pdf>,
- <sup>11</sup> <http://damsense.org/wp-content/uploads/2014/12/Waddell-Dec-w-Darcy-Letter-TO-Honorable-Michael-H-Simon-2.23.17.pdf>,
- <sup>12</sup> [http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix\\_I.pdf](http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix_I.pdf), page I12-3, para 12.2.1
- <sup>13</sup> [http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix\\_D-AnnexX.pdf](http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix_D-AnnexX.pdf),
- <sup>14</sup> Ibid
- <sup>15</sup> US Army Corps of Engineers Walla Walla District, 1992 Reservoir Drawdown Test, Lower Granite and Little Goose Dams, page 133.
- <sup>16</sup> <http://www.damsense.org/wp-content/uploads/2016/05/4.-Breach-Plan-Estimate-JW-21-Feb-2105.pdf>, Page 6.
- <sup>17</sup> Bonneville Power Administration. 2017-2030 Hydro Asset Strategy, page 23.
- <sup>18</sup> 4(h)10(c) is a section of the 1980 Power Planning and Conservation Act which BPA refers to when applying for US Treasury credits resulting from the non-hydro portion (e.g. navigation and irrigation) of various fish and wildlife expenses. The section says little about this but is frequently cited, since the clause refers to the Act not changing past accounting practices, that is taking a 22% credit for the non-hydro expenses. A display of these cost can be found on chart 22 of the briefing at: <http://www.bpa.gov/Finance/CostVerification/Documents/20130719-Slice-True-Up-101-Presentation.pdf>
- <sup>19</sup> [http://www.bpa.gov/Finance/FinancialPublicProcesses/2028/doc2028/Focus%202028\\_Federal%20Hydro.pdf](http://www.bpa.gov/Finance/FinancialPublicProcesses/2028/doc2028/Focus%202028_Federal%20Hydro.pdf), page 7.
- <sup>20</sup> <http://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/2016IPRDocuments/2016-IPR-CIR-Hydro-Draft-Asset-Strategy.pdf>, chart 23.
- <sup>21</sup> Sampson, R. 2018 *A brief review of the impacts to irrigated farmland from breaching the four dams on the Lower Snake River.* <https://damsense.org/wp-content/uploads/2018/10/Irrigation-Impacts-LSR-Dams.pdf>
- <sup>22</sup> [http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix\\_D-AnnexX.pdf](http://www.nww.usace.army.mil/portals/28/docs/environmental/lrstudy/Appendix_D-AnnexX.pdf), Annexes O through T.
- <sup>23</sup> <http://www.cbulletin.com/438250.aspx>,

See also financial report from Moody's that says that Asset to Debt ratio is 95%,

<http://www.bpa.gov/Finance/FinancialInformation/Debt/RatingAgencyReportsArticles/Moody's%20April%202016%20Final%20Report.pdf>.

<sup>24</sup> <http://www.damsense.org/wp-content/uploads/2016/05/4.-Breach-Plan-Estimate-JW-21-Feb-2105.pdf>

<sup>25</sup> NOTE: As of 10, September 2017 Snake river Spring/Summer Chinook returns to Lower Granite Dam are down 55% from the 10-year average, Fall Chinook are down 60%, steelhead are down 73% and predictions for 2018 based on "jack" chinook returns looks to make it the 3rd consecutive year of plummeting returns. Source: Corps of Engineer fish ladder counts as displayed by [http://www.cbr.washington.edu/dart/query/adult\\_daily](http://www.cbr.washington.edu/dart/query/adult_daily), for each run and year. For more background as to the urgency, see the December 2015 Salmon White Paper and Surrogate Appendix, <http://www.damsense.org/wp-content/uploads/2014/12/1.Snake-River-Endangered-Salmon-White-Paper-11-4-15.pdf>, and appendix, <http://www.damsense.org/wp-content/uploads/2014/12/1.2-Appendix-1-Fall-Chinook-Surrogates.pdf>, and the White Paper on Southern Resident Killer Whales, <http://www.damsense.org/wp-content/uploads/2016/05/7.-White-Paper-Southern-Resident-Killer-Whales-2.24.16.pdf>.

<sup>26</sup> [http://www.westcoast.fisheries.noaa.gov/publications/recovery\\_planning/salmon\\_steelhead/domains/interior\\_columbia/snake/proposed\\_snake\\_roll\\_up\\_10.25.16.pdf](http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/proposed_snake_roll_up_10.25.16.pdf), page 219

<sup>27</sup> Corps of Engineers, Special Report on Selection of Sites Lower Snake River, March 14, 1947, paragraph 394 comes to justify a positive BCR (the report's economic calculations showed in preceding chapters that it cost more to produce than could be made from selling it) by including two "if" conditions that are inconsistent with fair and reasonable economic calculation of benefits: "**IF** credit were taken for indirect navigation and power benefits, *which admittedly are great* and **If** additional credit were taken for the use of cheap hydroelectric power over electrical power produced by the next most economical means, full economic justification of this project on the inflated 1946 cost index would be assured". Emphasis added. These conclusions used to justify the "need" are an example that "two wrongs can make a right" in the Corp's world of twisting the logic and wording to get the answer they wanted.

<sup>28</sup> <http://www.damsense.org/wp-content/uploads/2014/12/National-Economic-Analysis-of-the-Four-Lower-Snake-River-Dams-2.16.pdf>,

<sup>29</sup> Citations are difficult to find, as it is the absence in programming documents that show the turbine replacements are not scheduled to occur, at least for the next 20 years.

<sup>30</sup> The information in this paragraph is derived from the Programmatic Sediment Management Plan (PSMP) prepared by the Corps Walla Walla District. This \$17 million study and plan was prepared in order to satisfy environmental concerns related to maintaining dredging on the lower Snake River. Principally in the Lewiston, Idaho area. The District did not however, consider breaching and the elimination of waterborne navigation in the alternatives, as they claimed it did not satisfy the "purpose and needs" argument. When challenged with public comments showing that the BCR for navigation was too low to justify the "need", the District then used economic data incorrectly from the 2002 EIS to support their claim for the "need". Based on the 2002 EIS, their claim of substantial navigation benefits was shown to be in error in a paper entitled "*Commercial Navigation on the Lower Snake River, Two Wrongs Don't Make a Right*", and can be found at [http://www.damsense.org/wp-content/uploads/2014/12/Report\\_LSD-Commercial-Navigation.pdf](http://www.damsense.org/wp-content/uploads/2014/12/Report_LSD-Commercial-Navigation.pdf). It is important to also note that this PSMP shows that movement and deposition of sediment deposits in the river is not harmful to the river ecology and that the continuing deposition of sediments in the Lewiston and Clarkston area of the river are a significant problem in terms of elevating flood risk in Lewiston. Both these points, and the fact that these sediments are a natural part of this river system, are further supportive of the breaching alternative. The PSMP can be found at [http://www.nww.usace.army.mil/Portals/28/docs/programsandprojects/psmp/PSMP\\_FEIS\\_Final\\_Combined\\_8-13-14.pdf](http://www.nww.usace.army.mil/Portals/28/docs/programsandprojects/psmp/PSMP_FEIS_Final_Combined_8-13-14.pdf).

<sup>31</sup> Corps of Engineers, Special Report on Selection of Sites Lower Snake River, March 14, 1947, paragraph 394 comes to justify a positive BCR (the report's economic calculations showed in preceding chapters that it cost more to produce than could be made from selling it) by including two "if" conditions that are inconsistent with fair and reasonable economic calculation of benefits: "**IF** credit were taken for indirect navigation and power benefits, *which admittedly are great* and **If** additional credit were taken for the use of cheap hydroelectric power over electrical power produced by the next most economical means, full economic justification of this project on the inflated 1946 cost index would be assured". Emphasis added. These conclusions used to justify the "need" are an example that "two wrongs can make a right" in the Corp's world of twisting the logic and wording to get the answer they wanted.

---

<sup>32</sup> <http://www.damsense.org/wp-content/uploads/2014/12/National-Economic-Analysis-of-the-Four-Lower-Snake-River-Dams-2.16.pdf>,

<sup>33</sup> <http://www.nwp.usace.army.mil/willamette/locks/>



# A letter to my neighbors in Eastern Washington.

It has been over 40 years since the last of the four lower Snake River Dams was completed and the promise of an “Inland Empire” was to be finally realized. Alas, we, especially those in the six counties adjacent to the lower Snake and our friends in Lewiston, have yet to realize this “empire.” Yes, we have lived the days of cheap hydropower, but as they say, there is no “free lunch.” This cheapness has come by, what we quietly acknowledged only to ourselves, significant federal subsidies. But they weren’t subsidies at all, they were loans, and they are now coming home to roost.

While being taken in by lavish proclamations of the Bonneville Power Administration and the Corps of Engineers, we overlooked that these four dams were far more costly than their efficient counterparts on the Columbia River. Federal and ratepayer derived funds have never been enough to keep these four dams operating at the level of production their promised value was based on, leading to further degradation of turbines already past their life expectancy. Beyond replacement of the oldest three turbines, which are vastly more expensive to replace than the Corps or BPA are willing to tell us, there will be no replacement of other turbines. BPA simply finds it cheaper to get power elsewhere.

BPA tell us that because of the cost of salmon recovery they can’t afford to fix things, but our power rates go up anyway. While these four impressive dams and reservoirs create a powerful picture of vast amounts of water piled 100 feet high to spin the massive turbines, it is an illusion. Unlike many of the dams on the Columbia, the lower Snake dams are “run of river,” meaning they have almost no storage potential and can only generate hydropower based on the seasonal flows of the river. (Being run of river also means there's virtually no flood control value.) So, when we need energy the most, on those hot and sunny August days, the dams can barely spin one out of six turbines. And when customers need the least power in the spring, all the dams spin all the turbines they can, generating surplus power that must be “dumped” at below market prices; often curtailing the wind turbines which many farmers now depend on to keep their farms operational. At the time of writing this document, the Mid-C price for BPA power is \$0.00 Mwh. This means we are giving surplus power to California at a loss of around \$32Mgh, which is the breakeven point for power produced by BPA. With all this financial hemorrhaging it is no wonder the BPA Administrator finally admitted in recent testimony to the Northwest Power and Conservation Council that “I am not in a panic mode, but I am in a very, very significant ‘sense-of-urgency’ mode.”

BPA and the Corps do this because heavy spring flows over the spillways creates immediately lethal or chronic doses of supersaturated gases that devastate salmon and other aquatic species. Slack water reservoirs do not allow for toxic levels of supersaturated gases to escape as they naturally would in a free-flowing lower Snake River. The Corps learned this the hard way in

the 1970's when Congress only funded three of the six turbines in each dam because there was too much hydropower, leaving the Corps no choice but to “spill” water. The result of spilling water was supersaturated reservoir gases leading to massive fish kills. As mitigation for supersaturating, hundreds of millions more were spent on another 12 turbines for “our dams,” because shredding fish through more turbines was considered ‘less lethal’ than the uncontrolled spill. In addition to the millions spent on more turbines, a further billion dollars has been spent on bypass piping in an attempt to keep fish out of the turbines, losing money on power sales at the same time.

All these expenditures and lost monies continue to pile debt for BPA, and eventually for us, the ratepayers. The interest payments on the debt for these four dams are 25% of revenues, resulting in the total cost to operate and maintain them exceeding the revenues from them; meaning that for as long as these dams exist, BPA loses money by spinning turbines on the lower Snake. The loss is even before BPA tries to pay off massive debt, now ~\$15-\$16 billion dollars, giving BPA the highest debt to asset ratio (99%) of any public utility in the country, excluding post-hurricane Puerto Rico.

The continued loss combined with BPA’s ever-climbing rates, which still can’t meet full-up costs, vs. open market prices show a clear trend that will undermine the entire hydro system, and our wallets, if they don’t start dumping the losing assets and put our money to work on the winners. They are not hiding this detail from us; we just aren’t reading the financial statements and strategic plans. Instead, we focus on text messages, LTE’s, ‘petition please for money’, and listen to the old hype and pro Snake Dam protagonists extolling their virtues.

What did we get for all this? Supposedly “record” salmon runs some years back. In reality, these records were baselined on the near total loss in the 1990’s, not the pre-dam days. In reality, runs are 3% of historic runs. In reality, our Idaho neighbors nearly lost their Sockeye, Steelhead runs are at record lows, the Chinook are spiraling down again, and NOAA says the “recovery” plans/actions will not recover spring/summer chinook. But the shad, pikeminnows, and walleye are doing great. Not bad for the billions spent on the dams, habitat, harvest, and hatcheries in salmon recovery efforts, but only if you enjoy slack water fishing, or are raking in the pikeminnow bounties in the tailrace of Lower Granite Dam.

In addition to these direct losses, we, and most especially the Tribal people who lived and fished for thousands of years along the river, lost a deep and irreplaceable connection to a place that stored much of the cultural identity and memories of those who once lived under these reservoirs. If one could put a dollar value on this reconnection to place and the ecosystem benefits, it would be many billions.

BPA, State and public contributions, and “sweat equity” have contributed billions to restoring salmon habitat in an attempt to avoid the only alternative that would work - Breaching. Much of this carefully executed work was performed by well-qualified practitioners and volunteers

and is now going to waste. It is not because they didn't do it right, but because so few fish can make it down and back through 16 dams and reservoirs. Nevertheless, BPA has cut recovery funding, ~ \$40 million this year, and with the first cuts being to those people who did it right but can only report empty rivers. As long as we have four dams on the lower Snake River, funding for habitat work will continue to be reduced. However, with a free-flowing river, this and additional habitat work will pay big dividends, with BPA and others investing in it.

And what about that "inland empire?" Well after the Corps flooded 20,00 acres of a once vibrant agricultural valley, flush with vineyards, orchards, villages, and tons of salmon to support tribes and farmers alike, per capita income in the reservoir area has been on the decline since 1980, four years after the construction camp closed. The number of small and mid-size farms capable of supporting a household also continues to decline. Small towns never boomed beyond the construction heydays, many now suffering from empty properties and youth flight to the cities. Our friends in Lewiston, stuck behind high levees prone to overtopping, have experienced growth rates less than half the rest of Idaho. The promise of significant savings for farmers shipping wheat by subsidized barging on the lower Snake never did see meaningful savings because the shippers set their rates only a few cents below rail rates.

The publicly owned Port of Lewiston (POL), in spite of significant taxpayer investments, is virtually out of the barging business. By failing to upgrade a few miles of rail to the most significant privately held grain terminal, Lewis and Clark, POL has held them hostage to the barging industry and the non-competitive rate increases that come along with that. In short, in spite of all the rosy projections, nothing but economic morbidity is in store for this part of the state.

When you add it all up, experienced economists using Corps data and planning guidance tell us the benefits over the remaining life of the projects is a humiliating .15-to-1, compared to a free flowing river which ranges from 4-to-1 to 19-to-1. To clarify, operating the lower Snake River dams will return 15¢ on the dollar for every tax and ratepayer dollar spent on them, compared to a free-flowing river, which would yield 4 dollars for every 1 dollar spent, even if the power is replaced. The yield would be much more significant at 19 dollars for every dollar spent if the surplus power is not replaced.

Haven't we paid enough for false promises based on myth and slick bookkeeping? We are ready to take back the river lost to us by these four dams. The hidden beauty in all this is that under those stagnant reservoirs is a 140-mile valley awaiting its rebirth. What was once lost can be reclaimed. By removing the earthen berms of each dam, a well-preserved river and its flood plains, kept in cold storage for over 50 years, meets the light of day and is set free. This protection from the destructive effects of human development that make many river

restorations an expensive challenge, along with prudent stakeholder planning by the State of Washington, the Tribes, the Corps, and local interests will free from the depths a highly valued place in terms of economic, ecological, cultural and aesthetic values. With a mindful and modern understanding of these values, the river can tell us where and to what extent a true gem of sustainable, resilient, redevelopment can take place. At a minimum, economists and engineers have estimated that 6,000 acres could be reclaimed for high-value crops, such as vineyards and orchards, requiring little or no irrigation, while still allowing thousands of acres for wild riparian areas. And this is before consideration of hillside vineyards on land visible today.

Along with the restoration of salmon and steelhead fishing and encounters, boating, hiking, biking, horseback riding, restored agriculture, wineries, restaurants, country inns, etc., and supporting services, we can bring in over \$600 million in annual in expenditures. This translates to over 5,000 new jobs to the six-county area. Imagine for Lewiston what that one, 14-acre vacant lot behind the levees will be worth in job creation, expenditures, tax revenue, and just plain fun once the town is reconnected to the Snake and Clearwater Rivers. Not to mention the removal of the flood risk from overtopped levees that currently stymies their downtown development.

If this weren't enough, there is the interesting twist on land disposition. Typically, and very likely in this case, 40,000 acres of Corps project lands would be transferred to the State of Washington and be under management of the Department of Natural Resources. This means that any revenue from the sale or lease of these lands would go into the State School budgets. A quick calculation reveals if the 6,000 acres of land noted above was leased out as vineyard or orchards it would bring in somewhere between \$40-60 million biennium to the 6 counties along the lower Snake. Not a silver bullet for fixing the state school budget but a huge windfall for these rural counties.

Since 2000, when the Corps concluded that breaching would devastate the agricultural economy, much has changed the Corps did not expect. Farmers pulling together to form Co-Ops have built large 'unit train grain loaders' capable of quickly moving grain to seaports in quantities large enough for them to better compete in Asian markets. The State introduced the 'Grain Shuttle,' which can provide car lot service to smaller farms. These shuttles can move grain efficiently to port facilities on the Columbia where barges can turn a profit, unlike the lower Snake, which is break-even at best. Also, over the last 15 years, several private railroads have upgraded trackage to handle heavier cars and speeds. Indeed, the enter length of the lower Snake River is now serviced by Class I and II railroads, further increasing the cost-effectiveness of rail over barging, which still must depend on federal tax subsidies. This improved rail line can service nearly all the grain elevators along the lower Snake. As part of the breaching costs, upgrading additional trackage to Dayton and building a unit train loader will allow farmers in this area to reap the benefits of an efficient rail system.

For those 15 or so irrigation farmers on Ice Harbor pool, you having been believing that with breaching replacing the irrigation would cost more than your land was worth. Not so, it turns out that after reanalysis by professional water supply/irrigation engineers, the cost of retrofitting your irrigation system is not the \$291 million estimated in the 2002 FR/EIS but something closer to \$15 million. In today's dollars that would be around \$19 million and well within the breaching cost estimates that provide BPA with net savings with breaching.

It is also time to recognize and rise above the long and divisive arguments brought on by agencies and environmental groups that have pitted one type of fisherman against another, and often for the sole purpose of diverting our attention from the one thing that can help them all; breaching the four lower Snake River Dams. Likewise, farmers have been pitted against recreationists, and private sector wind projects against government subsidized hydro. But, by focusing our energies on the real problem to get these reservoirs of entombment drained, all can benefit from a "rising tide" of prosperity, mutual appreciation, and cultural/aesthetic values.

Is this too an illusion or a vibrant achievable vision? It is very achievable, and in a matter of months, not years, by bringing the truth forward to defeat myth and pessimism. Since the dams are not economically viable and have proven to harm endangered species, the Corps of Engineers has an inherent fiduciary responsibility to take corrective action and have never needed a congressional authorization to breach the dams. They can breach them by bypassing the river around the concrete structure and placing the projects in a "non-operational" status. Breaching is many \$100's of millions cheaper than originally estimated by the Corps "consultants," and does not require new appropriations from Congress. Under the authority given in the 1980 Northwest Power and Conservation Act, BPA can pay for breaching as the most cost and biologically effective means of "fish mitigation" for the Columbia/Snake system.

Does the Corps need to wait on the Federal Courts and Judges to tell them what to do? No, being in court for one offense does not relieve the Corps from committing another similar crime while debating the first offense in court. There are no "get out of jail free" cards. Nor is there a need to wait on another 5-year study process to spend \$100 million while salmon are dying on the concrete to non-recoverable numbers when in fact the Corps already has an extensive study/plan and Environmental Impact Statement in place that covers breaching. This EIS is the same one that tens of thousands of you committed to, or boldly stood up in public meetings and challenged the Generals and political appointees from the Corps, NOAA, and BPA with your well-articulated statements. You were never told that an overwhelming majority of you were in favor of breaching the dams.

So now is the last chance for us, the majority silenced by a political decision years ago, to come forth and let any agency leader or elected official know that we want our river back. And we are not going to wait for more studies; there is no more time. Given that all the means are in place,



we must insist that breaching of two dams begin in December of this year, 2018. The reports, data, and EIS are clear, breaching is the only alternative left, and it must happen now.

Jim Waddell  
Civil Engineer, PE USACE Retired  
Former Deputy District Engineer for Programs, Walla Walla Washington





DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
CIVIL WORKS  
108 ARMY PENTAGON  
WASHINGTON DC 20310-0108

JAN 17 2017

Mr. Jim Waddell  
289 Ocean Cove Lane  
Port Angeles, Washington 98363

Dear Mr. Waddell:

This is in response to your letter co-signed with Ms. Sharon Grace, regarding immediate action to breach the four lower Snake River dams. An identical letter is being provided to Ms. Grace. I apologize for the delay in responding.

As you note in your letter, the U.S. District Court for the District of Oregon issued an Opinion and Order on May 4, 2016. The Order directs the Army Corps of Engineers (Corps) and the Bureau of Reclamation (Reclamation) to prepare a comprehensive Environmental Impact Statement (EIS) for operation and maintenance of the Federal Columbia River Power System. It emphasizes that the EIS prepared by the Corps and Reclamation should take a "hard look" at all reasonable alternatives, associated potential environmental effects, and ensure meaningful public involvement in the process; that hard look specifically mentions removing the four Snake River dams. The 2002 Lower Snake River Feasibility Report (FR/EIS) also mentions dam removal as an alternative; the other alternatives from that FR/EIS are the basis for ongoing mitigation actions.

The Corps is committed to conducting a National Environmental Policy Act (NEPA) process that is consistent with the guidance in the Order and satisfies Federal laws and regulations; the Corps will be accepting public input on issues to consider and will analyze all alternatives in its upcoming NEPA process to determine the appropriate way forward. Meanwhile it is also committed to following the guidance in the 2002 FR/EIS as a framework for its actions, which includes ongoing assessments as to the efficacy of the alternatives it has implemented to date; the results of those assessments will inform our next steps while the NEPA process is underway, and the NEPA process itself.

Thank you for continued interest in the Snake River dams.

Very truly yours,

Jo-Ellen Darcy  
Assistant Secretary of the Army  
(Civil Works)



# Sierra Club Newsletter, Nov. 2016

Dear [REDACTED],

We have a once in a generation opportunity to remove the Snake River dams!

For decades we've known that the best way to restore millions of salmon is to undo the terrible damage caused by the Lower Snake River Dams.

Federal agencies that manage the Snake River and its salmon and steelhead populations are now considering dam removal **for the first time ever!** This is your chance to speak up!

[Send your comment to federal agencies.](#)

The world has changed. Dam removal should be on the table. Here's why:

1. Wind and solar power in the Northwest already produce more energy per year than the four Lower Snake Dams combined. And much more wind and solar power is coming online. The Northwest has abundant clean energy resources and can readily replace electricity from these dams any more.
2. The Lower Snake River dams are over 45-years old and need billions in federal tax-dollars for repairs. Barge shipping through the dams has fallen by 70%. There's no reason to keep subsidizing these dams any more.
3. The Elwha dams give us proof that salmon can be restored when dams are removed. There are thousands of miles of high-quality salmon habitat waiting in Snake River watersheds, if we get rid of the lethal corridor of four dams.
4. Climate change adds greater urgency. The dammed reservoirs in the Lower Snake River are becoming even warmer and more deadly for salmon. Warm reservoirs give off methane, the most potent of greenhouse gases. Further, Puget Sound orcas, who rely on Snake River salmon are also in trouble, struggling to survive the loss of salmon.

[Take Action Today!](#)

Thank you for taking action and for all you do for Washington's environment!

Cecile Gernez  
Conservation Organizer  
Sierra Club Washington State Chapter

To learn more about the work of the Sierra Club Washington Chapter, visit [our website](#) and our [Facebook page](#).

This email was sent to: [REDACTED]

This email was sent by the [Sierra Club Washington State Chapter](#)  
180 Nickerson St, Suite 202 Seattle, WA 98109

[Unsubscribe](#) | [Manage Preferences](#) | [View as Web Page](#)

[Take action to restore salmon runs to the Columbia river basin!](#)



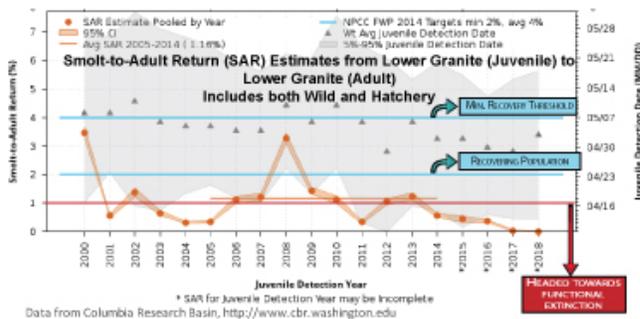
**TAKE ACTION**



# Newsprint Ads published by DamSense

This ad was published on Sunday, December 23, 2018 in The Oregonian.

## PUBLIC NOTICE SNAKE RIVER SALMON IN STEEP DECLINE



### Lower Granite Dam Fish Counts

Compared to 10yr Average

Fish Returns	2016	2017	2018
Spring Chinook	+6%	-56%	-50%
Summer Chinook	-28%	-48%	-58%
Fall Chinook	+6%	-35%	-55%
Sockeye	-21%	-80%	-76%
Steelhead	-42%	-54%	-67%
Wild Steelhead	-47%	-67%	-72%

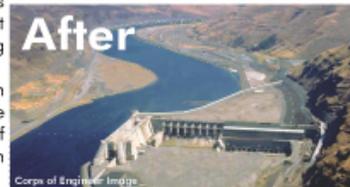
Data from Columbia Research Basin, <http://www.cbr.washington.edu>

These two charts unequivocally show the decline of the Snake River Salmon and Steelhead, despite more than a billion dollars spent on fish passage improvements over the four lower Snake River dams (LSRDs). The U.S. Army Corps of Engineers (Corps) and Bonneville Power Administration (BPA) have the power to reverse this declining salmon trend by breaching the LSRDs, starting this winter, before juvenile salmon begin migrating. Failure to breach will result in the death of approximately two million juvenile salmon at each dam starting in **five months**.

Since 2013, we have written over 100 letters, made over 80 visits and thousands of phone calls, to the Corps, BPA, NOAA, Northwest Delegation members and staff (State and Congress). All of these parties deny their own documents, reports, and environmental impact statements which support dam breaching as the only remaining option to save endangered salmon.



Breaching, by removing the earthen embankment next to each dam, will substantially improve the investment of fish and wildlife restoration funds and projects. Without breaching, thousands of salmon cannot reach improved habitat and our restoration investments are wasted.



### THE CORPS KNOWS...

The 4LSRDs have a combined benefit-to-cost ratio of \$0.15 to \$1.00. Therefore, it is your responsibility to halt operations of the 4LSRDs and place them into a non-operational status immediately. You have the authority to stop wasting tax money. Indeed barge navigation continues to be dramatically subsidized because many farmers have sought out cheaper railway services. There is already a plan to mitigate effected parties and is covered by the breach costs. Alternative 4 of the active 2002 EIS provides the Corps with all necessary NEPA coverage and ability to begin draw-down this winter of Lower Granite and Little Goose.

Given this information, why does the Corps remain inactive?

### BPA KNOWS... I L L E

Only 2 hours of the last 93,000 hours produced have been utilized by BPA customers. The dams provide surplus power which is sold at a loss and provide no "peaking power" benefits. When power is in its highest demand during winter and summer months, water levels are so low that only one or two of the six turbines per dam can be utilized. In addition, wind and solar production has already exceeded the 4LSRD output many times over. Rate-payers must now repay \$1 billion in failed juvenile passage improvements on the 4LSRD as evidenced by the SAR average since 2002 and fish counts.

Given this information why does BPA continue funding the 4LSRDs?

### GOVERNOR BROWN, WHY ARE YOU LISTENING TO "IT'S IMPOSSIBLE"?

Breaching the LSRDs can and must begin in 2018 to save our salmon and tax/rate-payer money. The Corps can and must breach due to its fiduciary responsibility to place failed projects into a non-operational status. BPA is required to pay for breaching; this will save rate payer money and is the cheapest option to accomplish salmon recovery. Working together, these two entities can restore salmon and steelhead within a few years and save the Southern Resident Killer Whales from going extinct. But if, and only if, breaching is begun this winter.

## CAUTION: NOT ALL ENVIRONMENTAL GROUPS ARE EQUAL

Environmental groups like Sierra Club, Save Our Wild Salmon, and Orca Salmon Alliance think the answer to saving Snake River Salmon and Steelhead is increasing ineffective spill, continuing needless studies, and furthering endless litigation. These misguided ineffective approaches will not prevent the functional extinction of the Snake River Chinook runs. However, the Corps already has an existing Environmental Impact Statement with a fully developed and detailed breach plan which remains the only option to saving these species. If your favorite organization does not support dam breaching this winter, request a change to its policies. Also exercise your right as a constituent. Contact your elected officials to request they urge the Corps to begin dam breaching this winter: the only bold action that will save these runs and Southern Resident Killer Whales.

Governor Kate Brown • (503) 378-4582 • Office of the Governor 900 Court Street NE, Suite 254 Salem, OR 7301-4047  
 Senator Jeff Merkley • (503) 326-3386 • 121 SW Salmon Street., Suite 1400 Portland, OR 97204  
 Senator Ron Wyden • (503) 326 -7525 • 911 NE 11th Ave., Suite 630 Portland, OR, 97232

*Paid for by Center for Whale Research, [www.whaleresearch.com](http://www.whaleresearch.com) • In collaboration with Dam Sense, [www.damsense.org](http://www.damsense.org) | [info@damsense.org](mailto:info@damsense.org)*

This ad was published on Sunday, December 23, 2018 in The Seattle Times, The Bellingham Herald, and Peninsula Daily News, and will be published on Wednesday, December 26, 2018 in The Journal of the San Juan Islands.

*Paid Advertisement*

## ATTENTION

**GOVERNOR INSLEE, SENATORS MURRAY AND CANTWELL**

**In 5 months, roughly 2 million juvenile Chinook salmon will be killed by each lower Snake River dam and reservoir. You can prevent this!**



**Call the U.S. Army Corps of Engineers today. Demand dam breaching begin this winter. The Corps has the authority to put these dams into non-operational status.**



Photo simulation of dam breaching. U.S. Army Corps of Engineers. 2002 EIS Summary.

**14–18 months after breaching, approximately 400,000 of the saved juvenile Chinook salmon will return as adults. Southern Resident Killer Whales and fisheries will benefit from the increase of returning salmon.**



Southern Resident Killer Whale swimming. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

Southern Resident Killer Whale breaching. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

Fishing boat. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

## URGENT WARNING

**Elected officials, if breaching does not begin this winter, you are killing the last hope for Southern Resident Killer Whales and our fisheries.**



Southern Resident Killer Whale breaching. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

Southern Resident Killer Whale on boat. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

Fishing boat. Columbia Entomology, NOAA Fisheries/Oregon Department of Fish and Wildlife. Source: Calver.

## A WELL INFORMED PUBLIC PROCLAIMS:

We the People on behalf of the Southern Resident Killer Whales, insist that Governor Inslee call Lt. Gen. Semonite of the U.S. Army Corps of Engineers and demand that he initiate the immediate breach of the lower Snake River dams, under Alternative 4 of the existing EIS, by placing them into non-operational status. Despite claims made by the Corps Northwest Division, this does not require congressional authorization.

The proclamation is based on overwhelming public comments to Governor Inslee's Orca Task Force in support of immediate dam breaching. In addition, over 700,000 petition signatures ([tinyurl.com/srkwpetition](https://tinyurl.com/srkwpetition)) support breaching the lower Snake River dams in 2018. This public support as well as compelling government documentation supporting immediate breach was disregarded by the Orca Task Force.

## CAUTION: NOT ALL ENVIRONMENTAL GROUPS ARE EQUAL.

Environmental groups like Sierra Club, Save Our Wild Salmon Coalition, and Orca Salmon Alliance, think the answer to saving Southern Resident Killer Whales is increasing ineffective spill, continuing needless studies, and furthering endless litigation. This misguided, ineffective approach will not prevent the functional extinction of Southern Resident Killer Whales and Snake River Chinook. If your favorite organization does not support dam breaching this winter, request a change to its policy. Then exercise your right as a constituent. Contact your elected officials—Governor Inslee, Senator Murray, Senator Cantwell—to request they urge the Corps to begin breaching this winter: the only bold action that will save Chinook salmon and Southern Resident Killer Whales.

Governor Jay Inslee • Office of the Governor • PO Box 40002 • Olympia, WA 98504  
360-902-4111 TTY/TDD call 711 or 1-800-833-6388

Senator Patty Murray • 154 Russell Senate Office Building • Washington, D.C. 20510 • (202) 224-2621

Senator Maria Cantwell • 511 Hart Senate Office Building • Washington, DC 20510 • (202) 224-3441

This ad was published in The Olympian on Sunday, December 23, 2018.

Paid Advertisement

# GOVERNOR JAY INSLEE:

The below headlines are a brief selection of the hundreds of international articles written this year which address the plight of the Southern Resident Killer Whales and Chinook salmon.

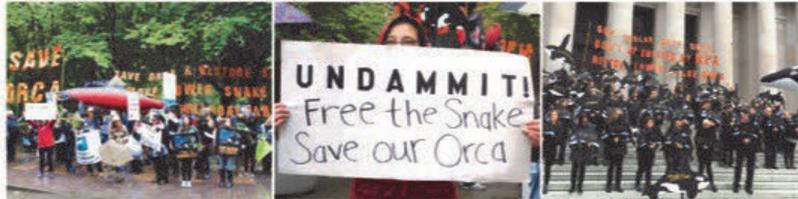
## THE WORLD IS WATCHING

- Are We Watching a Real-time Extinction of Southern Resident Killer Whales? *Vancouver Sun*
- Grieving Orca Mother Carries Dead Calf for Days as Killer Whales Fight for Survival *South China Morning Post*
- Grieving Orca Abandons Body of Her Dead Calf After a Weeks-Long Journey *National Post*
- Our Southern Resident Orcas are Headed for Extinction *The Tyee*
- Orca Mother Grieving for Dead Calf Inspires Push to Save Dying Pods *The Guardian*
- 'It Actually Breaks Your Heart': Grieving Orca Still Carrying Dead Calf One Week Later *The Sydney Morning Herald*
- Trump Officials Sued Over Killer Whales' Plummeting Population Crisis *The Independent*
- Grieving Mother Orca Still Swimming with Her Dead Calf, 16 Days Later *New Zealand Herald*
- Killer Whale Still Carrying Dead Baby After 16 Days *BBJ*
- Picture of Grieving Whale Swimming with Her Dead Calf Strikes a Chord Worldwide *Hindustan Times*

## OUR NATION IS WAITING

- The Northwest's Orcas are Starving and Disappearing. Can They Be Saved? *The New York Times*
- Could Breaching Snake River Dams Save Southern Resident Orca? *U1 Northwest*
- Southern Resident Orca Population Dwindles to a 30-Year Low *Seattle PI*
- 'What Extinction Looks Like': A Young Orca's Presumed Death Cuts Endangered Whale Population to 74 *The Washington Post*
- Heartache in the San Juan Islands: Locals Grieve as Resident Orcas Face Extinction *The Oregonian*
- Angry at Plight of Orcas, Residents Call for Drastic Measures to Save Them *The Seattle Times*
- Calls to Breach Snake River Dams to Save Northwest Orcas Grow Louder *Q13 FOX*
- Scientists Urge Gov. Inslee to Save Starving Orcas, Focus Efforts *KOMO News*
- Orca Survival May Be Impossible Without Lower Snake River Dam Removal, Scientists Say *The Seattle Times*
- Lower Snake River Dams at Center of Debate to Save Endangered Orcas 300 Miles Away *Q13 FOX*

## AND WE ARE RISING



Left and Center: Save Our Orcas Demonstration at USACE and BPA Headquarters. Photo: Felix Fischer. Right: The Remaining 74 Assembly at the Capitol. Photo: Kelly Eric

## A WELL INFORMED PUBLIC PROCLAIMS:

We the People on behalf of the Southern Resident Killer Whales, insist that Governor Inslee call Lt. Gen. Semonite of the U.S. Army Corps of Engineers and demand that he initiate the immediate breach of the lower Snake River dams, under Alternative 4 of the existing EIS, by placing them into non-operational status. Despite claims made by the Corps' Northwest Division, this does not require congressional authorization.

The proclamation is based on overwhelming public comments to Governor Inslee's Southern Orca Task Force in support of immediate dam breaching. In addition, over 700,000 petition signatures ([tinyurl.com/srkwpetition](https://www.tinyurl.com/srkwpetition)) support breaching the lower Snake River dams in 2018. This public support as well as compelling government documentation supporting immediate breach was disregarded by the Orca Task Force.

"Orca's are a state treasure, and Washingtonians have an obligation to protect them." *Governor Jay Inslee, @GovInslee*

"Protecting and restoring the complex ecosystem these beautiful animals rely on will take a lot of work. There are no do-overs with the orcas. We must get this right." *Governor Jay Inslee, @GovInslee*

"Quick and dramatic action needs to be undertaken to save Southern Resident Killer Whales." *Governor Jay Inslee, Q13's Simone Del Bonaria*



## NOW, ACT ON YOUR WORD.

If you do not, at least 2 million juvenile Chinook will die during their passage at each lower Snake River dam and reservoir. This is your last chance to save the Southern Resident Killer Whales and our fishing industry.

This ad was published on the weekend of Nov. 3-4, 2018 in the Tri-Cities Herald and the Walla Walla Union Bulletin

## SETTING THE RECORD STRAIGHT: THE FOUR LOWER SNAKE RIVER DAMS' IMPACT ON EASTERN WASHINGTON

CORRECTING MISINFORMATION PRESENTED DURING THE  
HOUSE COMMITTEE ON NATURAL RESOURCES FIELD HEARING

PASCO, WASHINGTON • SEPTEMBER 2018

### BARGING/NAVIGATION

*"To move the same amount of wheat currently barged on the river system would require 137,000 semitrucks or 23,900 railcars, leading to increased fuel consumption, increased emissions, and increased wear and tear on our transportation infrastructure."*

*—Marc Greene | President, Washington Association of Wheat Growers*

Breaching the Four Lower Snake River Dams (4LSRD) will not add trucks to the roads since all but 3 small grain elevators on the Lower Snake River are also served by rail. A report by economists Ball & Casavant in 2001 stated, "...truck/rail is 24% more fuel efficient than truck/barge when analyzing the transport of wheat in Eastern Washington." It was concluded that the closure of commercial river navigation on the Lower Snake River would save 12.1 billion BTU\* of energy use each year.<sup>1</sup> These efficiencies have further improved since the report was written. Farmer cooperatives built two 100-car unit train grain loaders and are building a third near the river. The rail lines along the Lower Snake River have been upgraded allowing cheaper shipments from the Lewiston area to barge loading facilities on the Columbia or to grain terminals in Portland, Oregon. Petroleum shipments and 30-40% of the grain have already shifted to rail. Washington's "Grain Train" has grown to over 110 cars. In short, **rail shipments are more efficient, not affected by lock closures, add only slight increases to rail traffic, and are not subsidized by taxpayers.** Regarding the concern of increased emissions, reservoirs emit methane, which is 85% more potent than CO<sub>2</sub>. **The 4LSRD reservoirs emit about 45,000 equivalent tons in CO<sub>2</sub> from methane.**

1. Ball, Trent and Casavant, Ken; "Impacts of a Snake River Drawdown on Energy and Emissions Based on Regional Energy Coefficients," University of Washington Department of Civil Engineering and Washington State University Department of Agricultural Economics, 2001

\* British Thermal Unit. One BTU is equal to the amount of energy used to raise the temperature of 1 lb of water, 1 °F.

### HYDROPOWER/ECONOMICS

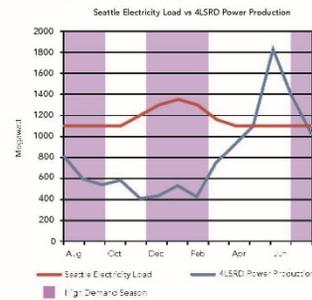
*"These four dams can power nearly two million homes, or a city the size of Seattle, and provide a reliable base load; important energy to meet BPA's peak loads during the hottest days in the summer, when the wind doesn't blow, or the coldest part of winter, when the sun doesn't shine."*

*—Cathy McMorris Rodgers | US Congresswoman, WA 5th Congressional District*

The US Army Corps of Engineers (Corps) states **there is not enough power to reasonably provide sufficient electrical needs to 2 million homes.** Based on the actual production of power produced by the Snake River between 2010-2015, **"1.87 million customers would mean each would only use 294 kWh/month which isn't reasonable or in line with Northwest averages."** Therefore, the 4LSRD are unable to support the electricity demand of Seattle annually.

**Over the past 93,000 hours of power production from the 4LSRD, only 2 hours were used by Bonneville Power Administration (BPA) customers;** indicative of the large amounts of surplus hydropower, which are sold at a loss to rate payers. Removing the 4LSRD will save money that BPA can apply to other hydropower projects. **These dams are twice as expensive to operate as the Corps' Chief Joseph Dam on the Columbia,** which produces twice the amount of power as the 4LSRD combined.<sup>2</sup> The graph at right shows that the 4LSRD has the lowest power production during the summer and winter months, when electricity in Seattle is most in-demand.

1. USACE, Walla Walla District | Residential Use • 2. BPA | "2017-2030 Hydro Asset Strategy," page 23



### AGRICULTURE/ECONOMICS

*"The point is, you have to have water in order to irrigate our diverse agricultural economy. If you take that away that would have a huge, huge impact on our economy."* —Doc Hastings | Former US Congressman, WA 4th Congressional District & Former Chairman, Natural Resources Committee

**Of the 4 reservoirs on the Lower Snake River, only 1 is used by 13 farmers for incidental irrigation** via Ice Harbor's reservoir. Once breached, irrigation pipes and pumps can be added to reach the lower water level.<sup>1</sup> This cost can be absorbed by BPA as mitigation costs for breaching. The Corps' 2002 Feasibility Report/Environmental Impact Statement (FR/EIS) provided a gross over estimate of \$291 million to modify the irrigation system as a result of the drawdown of Ice Harbor pool; this was twice the assessed value of the farmland. The conclusion was that these farmers would be bought out. In recent months, water supply engineers have recalculated the cost of irrigation modifications and found that in current year dollars it would cost \$19 million. **Available pipe and pump sizes inevitably lead to larger system capacities, therefore these modes will allow for the irrigation of an additional 5,000 to 7,000 acres, further driving up farm employment and income in Eastern Washington.**

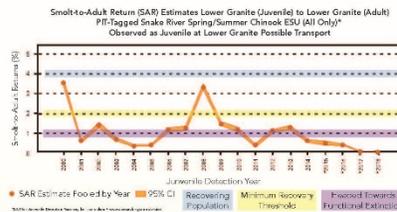
1. Sampson, Rob; "A brief review of the impacts to irrigated farmland from breaching the four dams on Lower Snake River," 2018

### SALMON RECOVERY

*"Some argue that the Four Lower Snake River Dams in particular have negatively impacted migratory fish, yet the data shows average fish survival rates of 97%."* —Cathy McMorris Rodgers | US Congresswoman, WA 5th Congressional District

**We are not recovering these fish, despite the Corps spending over \$1 billion to improve fish survival over the dams.** Actual mortality of each dam and reservoir averages 10%, equaling roughly 40% across all 4 dams and reservoirs; therefore, the actual survival rate is about 60%.

Smolt-to-Adult Ratios (SAR) measure the survival of Chinook and determines if they are recovering as a species. The target is to be above 6%, but **the SAR have been declining well below 1% for the last 7 years** and have averaged around 1% for the last 30 years; see the chart at right. Coupled with this, **daily fish counts continue to be below the 10 year average.** According to the 2002 FR/EIS, **with breaching we can achieve 11% SAR for Spring/Summer Chinook and 31% SAR for Fall Chinook;** breaching restores up to 70 miles of Fall Chinook habitat. These high survival rates show that these fish are able to rapidly recover.



### FLOOD CONTROL

*"The Columbia and Snake Rivers and the federal Columbia River Power System provide...flood control for our local communities."* —Dan Newhouse | US Congressman, WA 4th Congressional District

The fact is, "The four dams are all run-of-river facilities, which means that they...pass water through the dam at about the same rate as it enters the reservoir. These dams were not built to control floods."<sup>1</sup> They do however substantially increase the flood risk for Lewiston, Idaho.

1. USACE, Walla Walla District; "Improving Salmon Passage, Lower Snake River Juvenile Salmon Migration FR/EIS," February 2002



**Email from Sierra Club, Dec. 23, 2018**

**Subject: Response to Dam Sense advertisement on salmon and orca**

Dear Sierra Club ExCom, ConsCom, LegCom and PolCom members,

We're deeply disappointed that Dam Sense would say something like the advertisement running in the Seattle Times. There is no difference in our goals, which is removing the four Lower Snake River dams as early as possible. There is room for differences in approach and strategy, but our salmon and orca need our collective best efforts, not divisiveness.

The Sierra Club fully supports removing (bypassing) the four lower Snake River dams, and is a strong advocate for that. The Snake River is our best opportunity anywhere on the West Coast to increase salmon abundance for orcas and also sport, commercial and Tribal fisheries. We have a three-state campaign focused on this issue coordinated among our Idaho, Washington, and Oregon chapters.

We can assure you as volunteers who care deeply about salmon and orcas, and want to see swift action taken to restore them, you can be very proud of the work Sierra Club is doing alongside Save Our Wild Salmon and the Orca Salmon Alliance.

The Army Corps of Engineers and Bonneville Power Administration, which own and control the four Lower Snake River dams, have refused for decades to even consider removing the four lower dams. Doesn't really matter whether Dam Sense thinks they may have the legal authority; they don't want to remove the dams. Nor does the Trump Administration to whom they report. Maddening, but that is what we're faced with.

But we don't despair and neither should you. What Sierra Club and Save Our Wild Salmon are doing is working to gain leverage over these stonewalling agencies. As we've seen regularly over the past two years, the courts have authority to compel federal agencies to take actions based on what the law requires. As a result of Sierra Club, Save Our Wild Salmon and Earth Justice lawsuits, the courts have now ordered all federal agencies with control over the Snake River dams to include removal of the four lower dams as part of their environmental impact statement, which is currently underway.

We're more hopeful than ever that the Lower Snake dams will be removed because the evidence is strong: We don't need these dams anymore and getting rid of them will be a big boost for salmon and orcas. The real question is what is the strategy that actually delivers dam removal as fast as possible – and what do we do in the meantime to help salmon and orcas, and speed up the process.

This is where Dam Sense really gets it wrong.

One of the actions that fisheries scientists say is an essential action to benefit salmon and orcas is more "spill" – water spilled over dams spillways to speed small out-migrating salmon to the ocean. Dam Sense unfortunately dismisses this key action which is strongly recommended by fisheries scientists and required by the courts. The scientists are very clear that increased "spill" is essential now and will remain necessary for the Columbia River dams when the Lower Snake River dams come down.

Governor Inslee and Governor Brown are actively working to make this spill possible; the states of Washington and Oregon do influence how much spill is allowed. They are using the authority they have



as state governors to put this key action in place. We recommend thanking them for initiating this action and asking them to implement the highest scientifically supported spill levels as early as possible starting this spring. Rather than criticize them for what they cannot do, as Dam Sense suggests, urge them to do everything within their power to advance the federal agency process for removing the dams.

And secondly, Dam Sense gets it wrong to criticize the “study” process recommended by the Orca Task Force, which Sierra Club, Save Our Wild Salmon and the Orca Salmon Alliance strongly support. This "stakeholder process" is critical work. While the value of services provided by the dams has declined, it is not accurate to say you can just pull the plug on the dams without addressing the modest amount of hydropower, river shipping, and irrigation that the dams still provide, or dismiss impacts to local communities nearest the dams. Lewiston ID, Clarkston WA, as well as other communities and farms must have the opportunity to shape their future when the dams come down.

None of these issues are showstoppers for removing the dams, but a plan and funding needs to be in place to address them. The plan will likely require congressionally authorized funds along with commitments of funding from the Bonneville Power Administration, which are not in place now. Moving forward with a stakeholder process means the Northwest will be ready to act quickly when the decision comes to remove the dams.

We fully recognize the urgency for both our orca and the salmon. The Sierra Club is pursuing the strategy we believe can deliver near-term benefits (spill) and move dam removal forward at the earliest opportunity. Attached is a letter that was sent from salmon scientists to the Orca Task Force explaining their support for spill and lower Snake River dam removal.

We will be reaching out to you and all of our members next year to keep Washington on track for putting the increased spill standard in place, to obtain the budgets necessary to implement the actions prioritized by the Orca Task Force and Governor Inslee from the state legislature, and to build public support for the delegation, governor and federal agencies to move forward with dam removal as part of the NEPA process currently underway.

Thanks for your attention,

Margie Van Cleve

Conservation Chair, Washington Chapter Sierra Club

Bill Arthur

Chair, Snake Columbia River Campaign, Sierra Club



# Stakeholder Outreach Timeline

Letters and documents were mailed via U.S. Mail or hand-delivered to the many stakeholders listed. You can review each document in its entirety at [www.damsense.org](http://www.damsense.org). This list is not exhaustive and does not include all public outreach or education events attended by DamSense volunteers nor the many telephone calls to various parties.

## Executive Branch

1. Dec. 26, 2018 | Jim Waddell letter to General Semonite at HQUSACE
2. Oct. 12, 2018 | Email Response from NWD BG Helmlinger
3. Jan. 4, 2018 | Joyce D Parks to Mindy Simmons US Army Corps urging immediate use of 2002 EIS to begin dam breaching
4. Aug. 2, 2018 | Letter to Elected Officials from Amber Rose
5. July 6, 2018 | Letter to General Semonite from Amy Eberling
  - a. Aug. 6, 2018 | Response from General Semonite
  - b. Aug. 14, 2018 | Rebuttal from Amy Eberling
6. Jan. 1, 2018 | Joyce D Parks Letter to Anne Cann, US Army Corps encouraging LTG Semonite, the Environmental Advisory Board and Corps leadership to take immediate action using 2002 EIS
7. Jan. 1, 2018 | Joyce D Parks to President Trump requesting Executive Order to Breach the Dams
8. Feb. 23, 2017 | Jo-Ellen Darcy, Asst Secretary of the Army to James Waddell, page 3
9. Dec. 20, 2016 | Sharon Grace to Chris Yates, NOAA Assistant Regional Administrator
10. June 17, 2016 | Jim Waddell to Lieutenant General Todd Semonite, US Army Corps of Engineers
11. May 11, 2016 | Sharon Grace/Jim Waddell to Jo-Ellen Darcy, Asst Secretary of the Army; re Court Decision
12. April 14, 2016 | Balcomb/Berta/Grace/Waddell to Kathryn D. Sullivan, Undersecretary of Commerce for Oceans and Atmosphere Administrator NOAA
13. March 4, 2016 | Jim Waddell to President Barack Obama letter, email
14. Feb. 23, 2016 | Sharon Grace/Jim Waddell to Jo-Ellen Darcy, Asst Secretary of the Army
15. Nov. 3, 2015 | Carl Christianson/Jim Waddell to Eileen Sobeck, Assistant Administrator, NOAA Fisheries; Recovering Federally Endangered Snake River Salmon and Steelhead
16. Dec. 21, 2015 | Group to Bostic re Vail Follow Up Letter
17. Oct. 21, 2015 | Group to Lt. Col. Timothy Vail, Commander, USACE Walla Walla District
18. May 27, 2015 | Hansen/Waddell/Weiss/Wieland to President Barack Obama; Recovering Federally Endangered Killer Whales

19. May 2015 | Maxine Waddell to Michelle Obama; Recovering Endangered Species by breaching lower Snake dams
20. April 28, 2015 | Thomas O'Keefe, American Whitewater to President Barack Obama
21. April 23, 2015 | Kevin Lewis, Idaho Rivers United to President Barack Obama
22. Jan. 21, 2015 | Group to Jo-Ellen Darcy, Asst Secretary of the Army; Recovering Federally Endangered Killer Whales by breaching the lower Snake dams; also sent to Patty Murray, U.S. Senate 2015
23. Oct. 9, 2014 | Jim Waddell to Jo-Ellen Darcy, Asst Secretary of the Army
24. April 14, 2014 | Jim Waddell comments to the U.S. Army Corps of Engineers Waterway Users Advisory Board
25. Sept. 13, 2013 | Jim Waddell to Jo-Ellen Darcy, Assist Secretary of the Army

## Congressional Branch

1. June 13, 2018 | Letter to Senator Kilmer from members of Gig Harbor Rotary Club
2. April 24, 2018 | Joyce D Parks to Alaska's US Congress Murkowski, Sullivan & Young
3. April 2, 2018 | Jim Waddell to the office of Washington Representative Dan Newhouse
4. April 12, 2017 | Gary Lane & Group (small businesses of Riggins ID) to Idaho Senator James Risch
5. Nov. 2, 2016 | Howard Garret, Orca Network to Governor Jay Inslee
6. Nov. 2, 2016 | Howard Garrett, Orca Network to The Honorable Patty Murray
7. Nov. 2, 2016 | Howard Garrett, Orca Network to The Honorable Maria Cantwell
8. Jan. 24, 2015 | Group of Scientists to Senator Patty Murray, SRKW CSI Scientist's Letter
  - a. In addition, this letter personally addressed and hand delivered to the following DC offices by Jim Waddell and Jenna Ziogas; Maria Cantwell, Mike Crapo, Jo-Ellen Darcy, Susan Delbene, Eric Hansen, Derek Kilmer, Rick Larson, Rodger McMorris, Jeff Merkley, Dan Newhouse, David Reichert, Adam Smith, Ron Wyden, ASA(CW), CEQ and the Secretary of the Interior.
9. Nov. 3, 2015 | Carl Christianson/Jim Waddell to Senator Murray

## State Branch

1. May 1, 2018 | Jim Waddell (hand delivered) to Washington's Southern Resident Killer Whale Recovery and Task Force
  - a. Was subsequently handed out at all other five Orca Task Force meetings
2. Sept. 20, 2018 | Howard Garrett in response to Sen. Kevin
3. Sept 10, 2018 | 2nd Letter to Senator Kilmer from Gig Harbor Rotary Club
4. Sept. 5, 2018 | Jim Waddell to the residents of Eastern Washington

5. Jan. 14, 2018 | Jim Waddell to WA Representative Mike Chapman. Provides requested input re: House Bill 2417
6. Jan. 5, 2018 | Howard Garrett to Orca/Salmon Alliance re News Release and Explaining the Feasibility of Breaching
7. Nov. 1, 2017 | Sharon Grace to Puget Sound Leadership Council
8. Oct. 30, 2017 | Howard Garrett, Orca Network appeals to Puget Sound Partnership for help
9. July 19, 2017 | John Twa Comments for the Inland Waterway Users Board meeting
10. July 19, 2017 | James M Waddell Comments for the Inland Waterway Users Board meeting
11. July 12, 2017 | John Twa Letter to the Army Corps of Engineers Environmental Advisory Board meeting in Traverse City, MI
12. July 12, 2017 | James M Waddell Letter to the Army Corps of Engineers Environmental Advisory Board meeting in Traverse City, MI
13. April 17, 2017 | John Twa to the Nez Perce County Commissioners about dam breaching
14. Feb. 23, 2017 | Jim Waddell Addendum ASACW Darcy letter to the Honorable Michael H Simon
15. Feb. 13, 2017 | Jim Waddell Amicus Brief to the Honorable Michael H Simon
16. Dec. 1, 2016 | Letter from London Fletcher, public input to Federal Agency Scoping Meeting
17. Dec. 1, 2016 | Letter from Joel Fletcher, public input to Federal Agency Scoping Meeting
18. March 16, 2016 | Earth Economics Press Release Snake River Dams

## Environmental and Other Organizations

1. Dec. 23, 2018 | Full-page newspaper ads published in The Seattle Times, The Oregonian, The Bellingham Herald, Peninsula Daily News, and the Journal of the San Juan Islands
2. Sept. 17, 2018 | Amy Eberling to the Environmental Advisory Board
3. Oct. 29, 2018 | Southern Resident Orca Task Force Draft Report: A Guide for BOLD Commenting
4. Aug. 22, 2018 | Letter to Gov. Inslee & Orca Task Force by Joyce Parks
5. Aug. 20, 2018 | Letter to Mark Pointer by Joyce Parks
6. May 20, 2018 | Tacoma News Tribune, John Burkhart
7. May 8, 2018 | News Release from University of Washington Tacoma, 'Hope for Orcas' to Discuss Threats, Prospects for Southern Resident Killer Whales



8. May 5, 2018 |Hope for Orcas: Orca researcher Ken Balcomb and an Urgent Call to Action and Jim Waddell, UW-Tacoma William Philip Hall
9. April 29, 2018 |Salmon and Orca are on the Edge of Extinction, Anacortes Library Community Room
10. Jan. 10, 2018 |Ad expands to the The Olympian to bring attention to plight of Southern Resident Killer Whales and endangered wild salmon they depend upon.
11. Jan. 7, 2018 |Seattle Times Full-page Ad: Dammed to extinction, Southern Resident Orcas are starving. Time is running out!
12. Jan. 6, 2018 |Press Release re Ad Informing Governor Inslee and Senator Murray
13. Jan. 5, 2018 | The Journal of the San Juan Islands: Thousands start ad campaign to breach Snake River dams