

The lower Snake.....

River of Opportunity
or Reservoirs of Defeat?

Presented by Jim Waddell

Civil Engineer, PE US Army Corps of Engineers Retired

Website: Damsense.org

Background and Sources

- 35 Years with the Corps
- Field Constr/Operations to Policy, Authorities, Legislation, etc., in DC HQ
- Deputy District Engineer for Programs, Walla Walla District, 1999-2002
- Oversaw last 1-2 years of the Lower Snake Feasibility Study (LSFS)

- Retired 2011...ButIn 2013 Captured In the Documentary DamNation
- Since Then, 10,000 Hours Trying To Decypher All the 4 LSRD Issues,
This is Where 90% of "My Knowledge" Comes From
- Not Paid by Anyone, Don't Belong to/Represent Any Organizations

- DamSense is a Website Where Volunteers, In and Out of Gov, and Small Number of
Compensated Staff/Consultants, Post Information, Reports, Letters etc.

Sources

- 95% Government Data, Reports, Websites, etc.
- 2002 LSFS/EIS is Key
- 95% Is in the Public Domain
- 5% From FOIA Requests
- Individuals or Retirees From the Corps, NOAA/NMFS, BPA, EPA, USFWS, States and Tribes Have Explained and Pointed Out Relevant Documents in the Public Domain
- Some Helped Research and Write Key Reports, eg., Supplemental Breach Plan to the 02 EIS

Overarching Economic & Cost Drivers

- The 4 LSRD's have never been economically viable, In 1947 .87 to 1, Today and BCR is well below 1 **compared** to Breaching which ranges between 4 to 1 and 19 to 1-----depending on the desire to replace the lost power.
- Full-up costs to tax and ratepayers appear to have exceeded power revenues for the last 5 years and is adding to BPA's "dire financial situation"
- \$1 Billion spent on passage improvements since the 2002 EIS was signed on the 4 dams.
- No passage improvement, What next and at what cost?

Cost of Dam Operations, Maintenance, Rehab

6 categories in Economic analysis, numbers for 2017

- Corps O&M, 92% BPA Debt, \$42m
- Turbine Rehab, BPA funded,\$18m
- Power Services, BPA funded O&M, \$37m
- System Improvements, Corps CRFM, 92% BPA Debt, \$30m
- Compensation Plan Hatcheries, BPA funded, \$33m
- Conveyance & Nav Dredging, 80% BPA Debt, \$12m

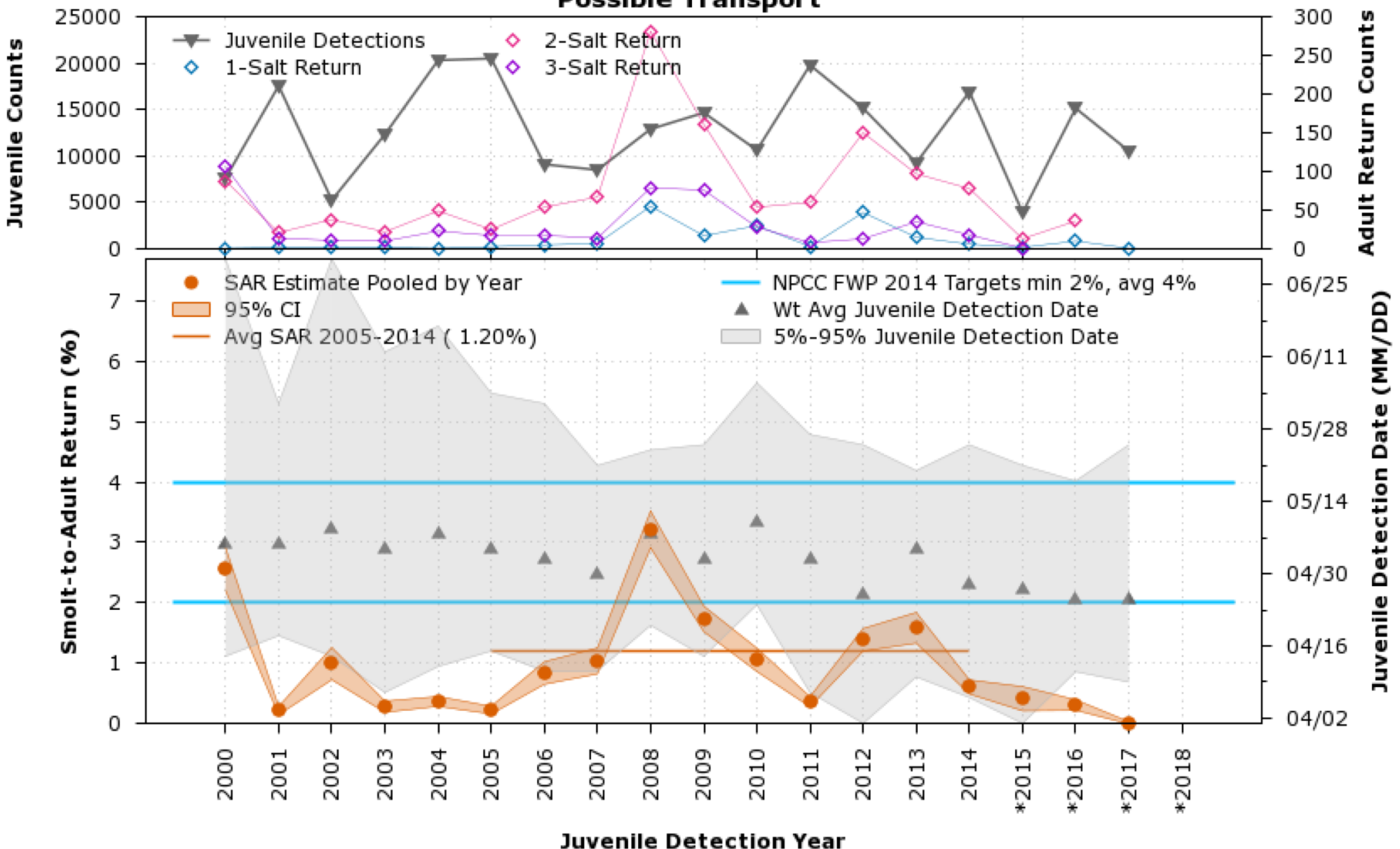
NREX is missing from this, estimate, \$10m

Total \$182 million

Interest/Debt Service \$45m, Grand Total \$227million

Power Revenue \$200 million.....**Loss \$27m**

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



Benefit Cost Ratios

Economic / Ecologic Change
 Positive Neutral Negative

AA = Average Annual Cost at 6.8% Discount Rate

National Economic Development Benefit Cost Ratios →	Keep the Dams 15¢ return on \$1 spent	Remove the Dams \$4.30 – \$19.76 return on \$1 spent
Endangered Species Mitigation		
Endangered Southern Resident Killer Whales (SRKW) & Salmon Species	The USACE spent \$800.0M over 15 years on failed system improvement efforts for juvenile salmon passage thru the four dams	Only remaining alternative in EIS for ecosystem recovery, increasing salmon numbers <i>and</i> prey availability for SRKW
Climate Change Challenges	Warming reservoirs kill salmon and favor predators, methane emissions increase	Diurnal cooling in natural rivers increases fish survival, allowing more fish to utilize high elevation spawning grounds in Idaho
Hydropower		
Hydropower	Benefit \$202.6M AA, <i>high side</i> Power generated is 2.9% of regional, with production trending downward due to aging infrastructure and the benefit likely a transfer from idle wind turbines	Cost \$0 - \$261.8M AA Shift to wind or other surplus sources; costs trending downward, regional grid surplus is 5 times production of LSR dams
Life Cycle Implementation	Cost \$269.4M AA, 91% of costs	Cost \$29.0M AA, breach 1 dam / yr
Transportation		
Inland Navigation	Benefit \$7.6M AA, <i>high side</i> \$1.4 AA, 9% of dam	Cost / Loss \$7.6M AA, rail improvement \$100M
Agriculture		

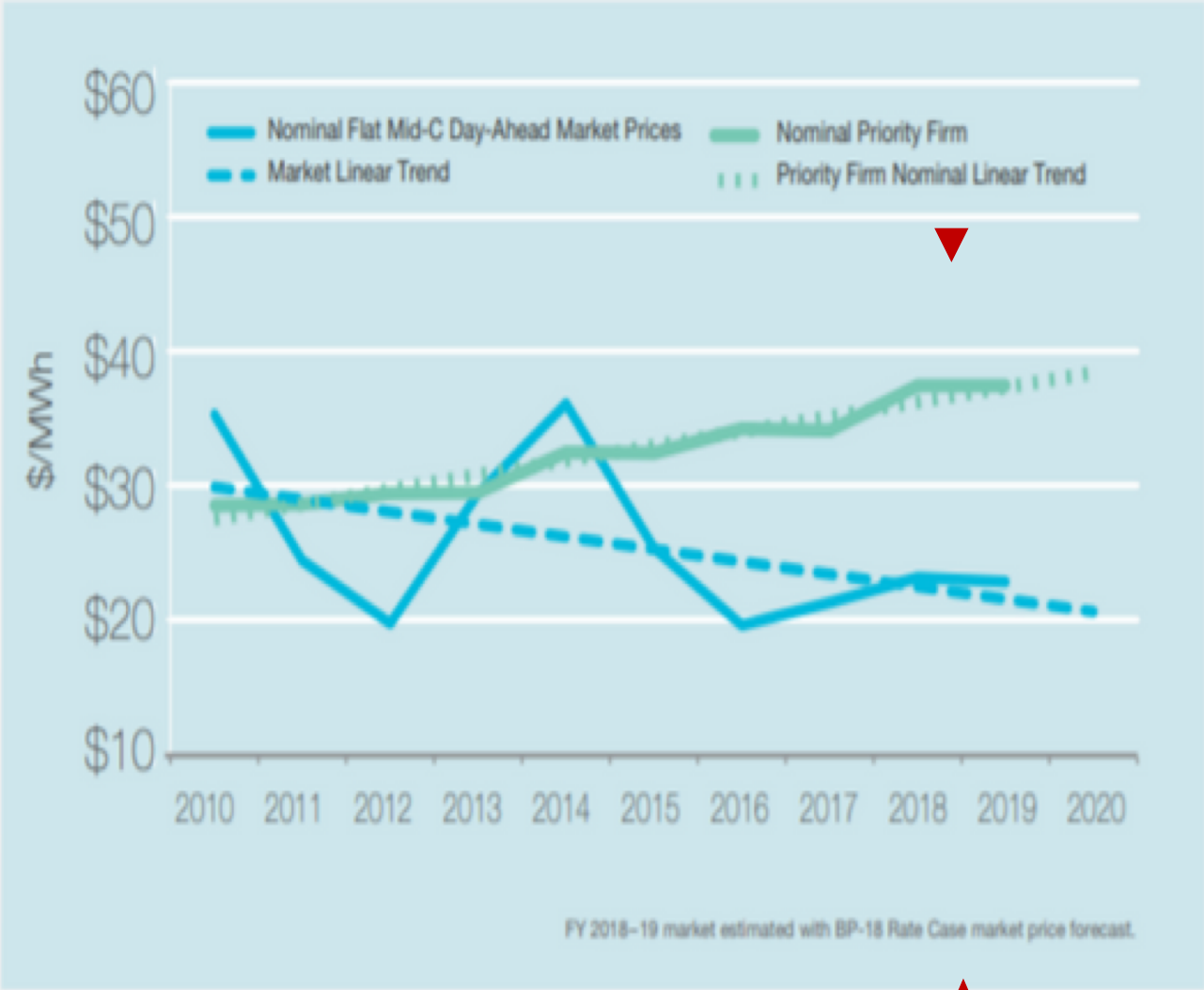
But What About Our Cheap Hydro Power?



Elliot Mainzer Testimony to Northwest Power and Conservation Council March 2018

Historical Priority Firm Power Rates

FY 2010 – 2019



As wholesale market prices (blue) have trended downward, BPA's Priority Firm power rates (green) have trended upward. BPA's rates and wholesale market prices are not entirely comparable because there are attributes of our power products that are not fully reflected in market prices. But our public power customers have made it clear that BPA's pattern of rate increases since 2008 is unsustainable. They are also facing competitive pressures and are prepared to look for alternative suppliers when it comes time to renegotiate long-term power contracts in just a few years.

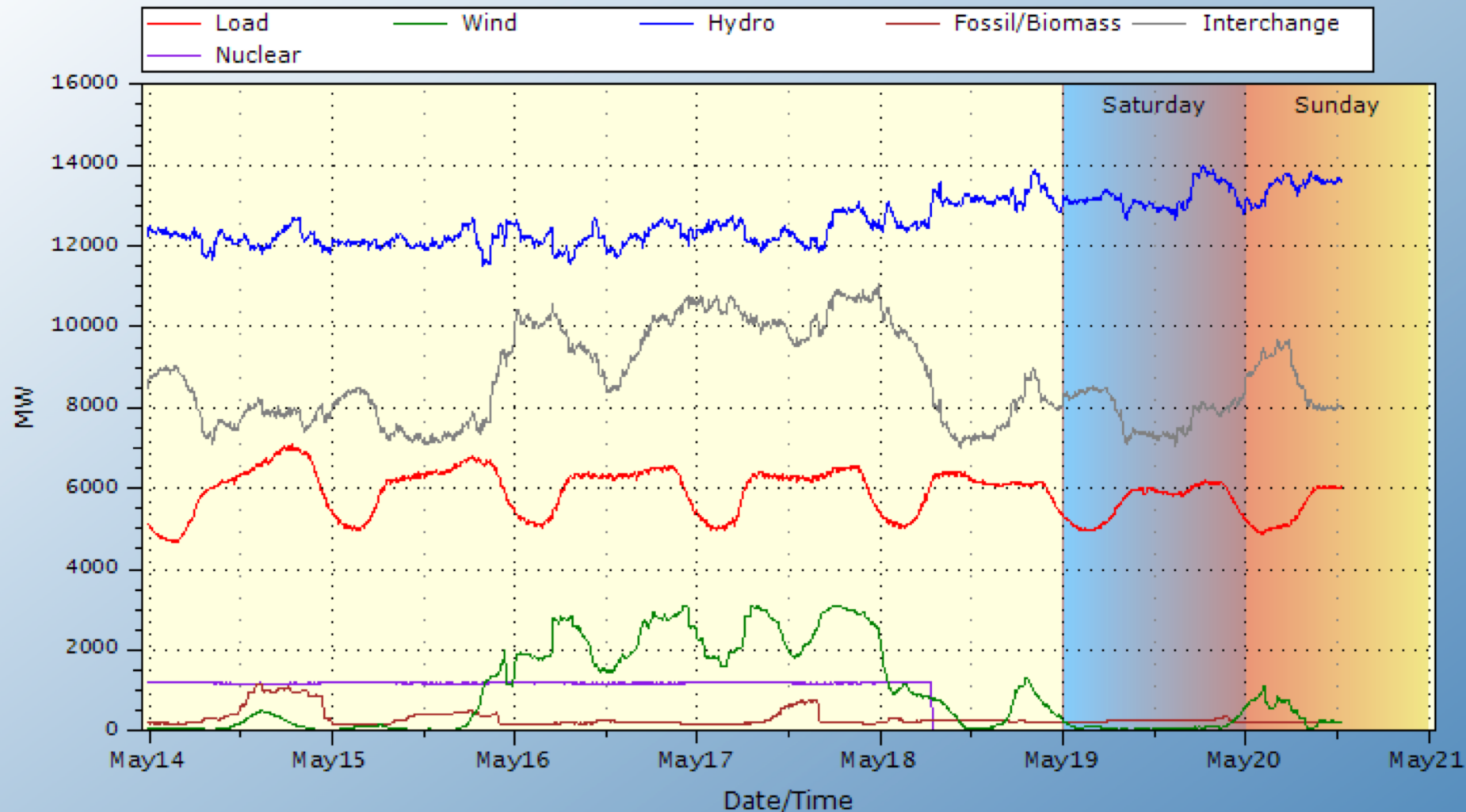
- \$16 at California Intertie

93,000 Hours of Production From 4 LSRD's
But
Only 2 Hours Were Needed
By BPA Customers

The Rest Sold As Surplus
Most Well Below Cost of LSRD's, \$50Mgh

Wind Was "Curtailed" 40 Times In 2017

Balancing Authority Load & Total Wind, Hydro, Fossil/Biomass, Nuclear Generation, and Net Interchange Last 7 d
14May2018 - 21May2018 (last updated 20May2018 12:46:02)



Based on 5-min readings from BPA's SCADA system for points 45583, 79687, 79682, 79685, 164377, and 70681.
Balancing Authority Load in Red, Wind Gen. in Green, Hydro Gen. in Blue,
Fossil/Biomass Gen. in Brown, Nuclear Gen. in Cobalt and Net Interchange in Gray.

Click chart for installed capacity info

BPA Technical Operations (TOT-OpInfo@bpa.gov)

BPA Debt Equals Assets,
The Hydro System Is “Underwater”

BPA Has Nearly Zero Days Cash Reserve

Customers Are Leaving Because of BPA’s High Cost

Habitat Funding Is the Target for Budget Cutbacks

Removing High Cost Under Performing Assets Only
Way Out of Insolvency For BPA

So How Many Fish will return?

- 2002 EIS Appears to Provide an Answer, But Does Not.
- Studies focused on relative returns between alternatives based on post dam runs. Even so, these studies viewed to be too optimistic.
- Then, BPA paid NMFS to do probability of extinction study between alternatives.
- While probability of extinction was less with breach, difference was marginal
- Economic valuation was drawn from these narrowed outputs
- Result is far less than would might be expected with natural river even in consideration of Hells Canon and Dworshak blockage of habitat.

Cost/Economics with Natural River

- Corrected breach cost now around **\$340 million**, not 1 or 2 billion
- Benefit to cost ratio is at least **4 to 1** if the hydro power is replaced, **much higher if surplus is not replaced**
- But, not really needed and will free up grid space allowing more wind and solar, **2000 megawatts of solar alone waiting** in BPA Integration que
- Breaching will save money for BPA/Corps which can be used on higher value dams and habitat restoration efforts. Eg., **Puget Sound Near Shore, \$400 million needed.**
- Provides **3-4 thousand more jobs** in State
- Land lease for restored viticulture/orchards could add **\$20-30 million a year to State School budgets and \$200 million in direct economic benefit**
- Shifts federal funding for waterborne navigation to other needs in Washington State, eg, Dredging, Jetties, Columbia River Locks, etc

Recreational Expenditures & Jobs Without Dams

The spending associated with recreation along a free-flowing LSR will generate substantial economic activity throughout the region, with the greatest economic activity occurring in the first four years.

- Jet Boating, Jet Skiing
- Raft / Kayak / Canoe
- Swimming
- Picnic / Primitive Camping
- Developed Camping
- Hike and Mountain Bike
- Hunting
- Angling

Table 5. Expected expenditures as a result of recreation from a free-flowing Lower Snake River (Values in millions, 2015 USD)

Year	Total	Asotin	Columbia	Franklin	Garfield	Walla Walla	Whitman
Year 1	\$501.1	\$120.4	\$23.6	\$141.8	\$30.1	\$50.5	\$134.7
Year 5	\$291.6	\$74.5	\$13.1	\$77.4	\$19.5	\$28.8	\$78.1
Year 10	\$347.9	\$86.8	\$16.0	\$94.7	\$22.4	\$34.7	\$93.4
Year 20	\$373.1	\$92.4	\$17.2	\$102.5	\$23.7	\$37.3	\$100.2

TABLE 7. JOBS SUPPORTED BY RECREATION EXPENDITURES

	Total	Asotin	Columbia	Franklin	Garfield	Walla Walla	Whitman
Year 1	4161	1104	181	1177	219	529	951
Year 5	2380	663	99	640	135	294	526
Year 10	2876	788	121	785	157	357	640
Year 20	3098	843	131	849	168	385	691

Reference: Mojica, J., Briceno, T., 2016. Regional Economic Analysis of the Four Lower Snake River Dams: A Review of the 2002 Lower Snake Feasibility Report/Environmental Impact Statement. Economic Appendix (I). Earth Economics, Tacoma, WA.

The 5 Polices or Means That Make Breaching Feasible in a Short Time Frame

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.

Details in Source Document [Five Means for Breaching 4 Lower Snake River Dams, Jim Waddell, 9.19.2017](http://damsense.org/reports/)
<http://damsense.org/reports/>

**The 5 Polices or Means That Make Breaching
Feasible in a Short Time Frame, Cont.**

2. The Corps' 2002 Environmental Impact Statement and Record of Decision provide the necessary NEPA coverage for breaching, although some updating may be required, 3-4 months.

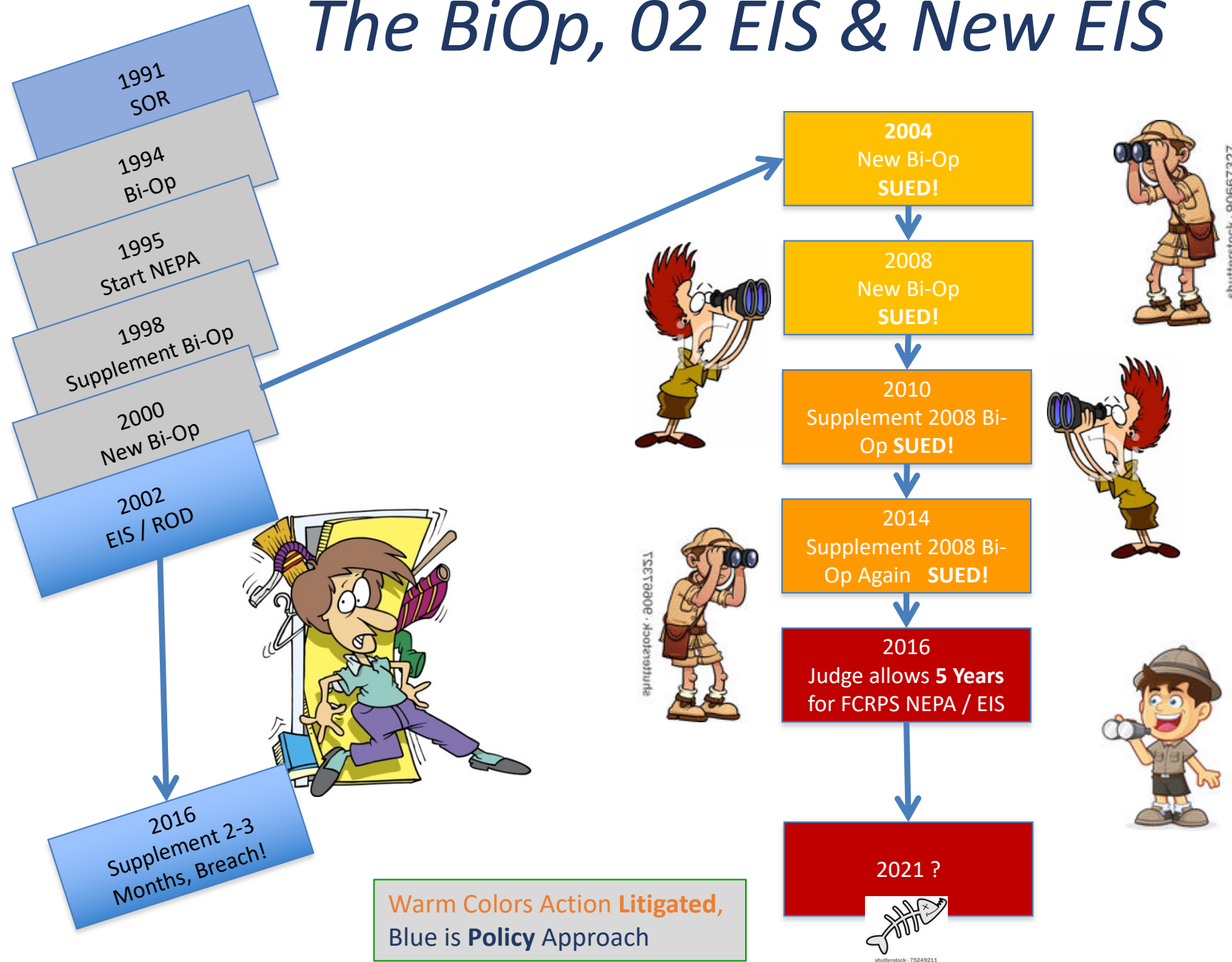
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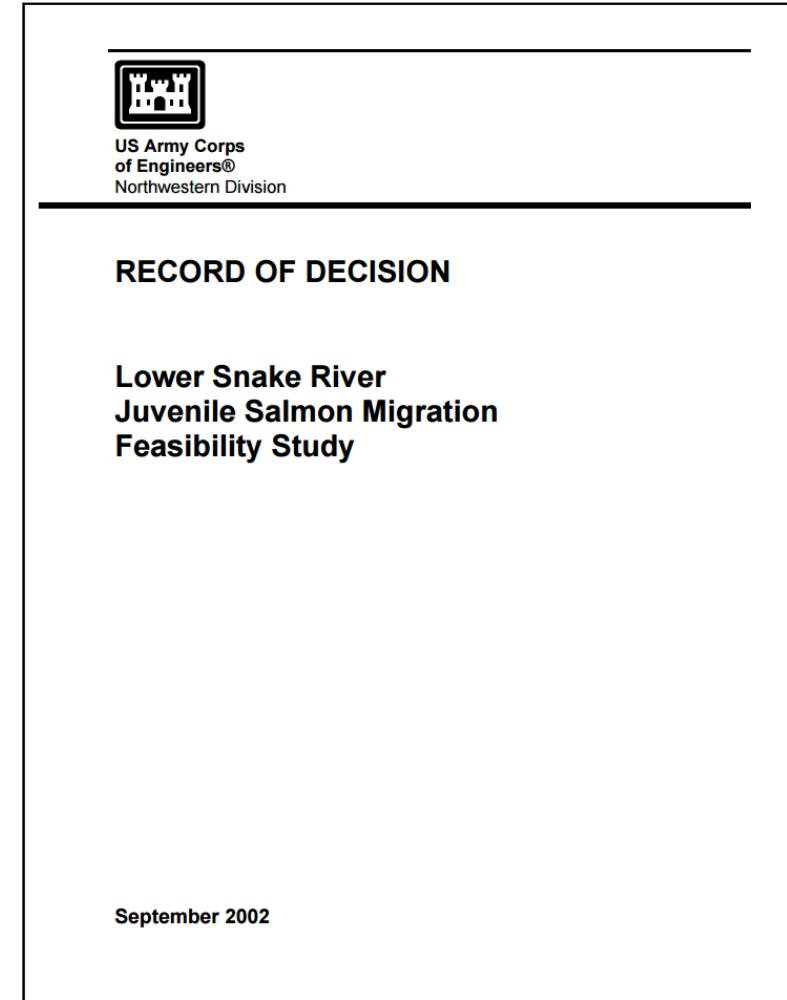
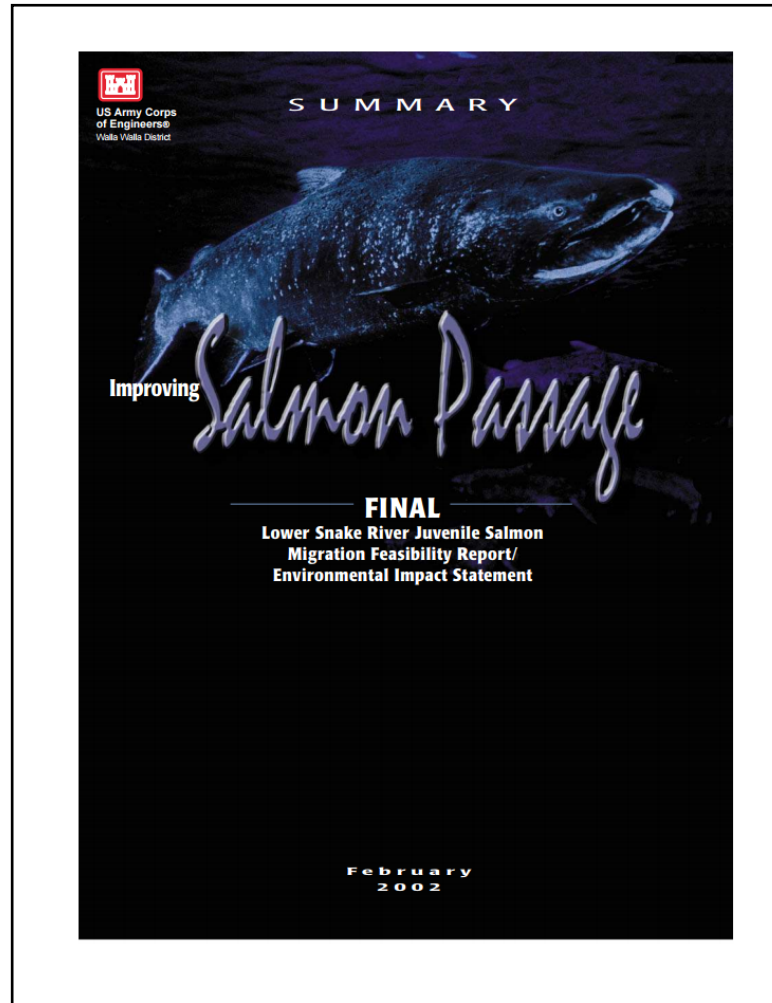
3. Neither the ongoing litigation over the 2014 Federal Biological Opinion nor the Court's order for a new EIS constrains the Corps from breaching the dams through channel bypass *now*.

Details in Source Document [Five Means for Breaching 4 Lower Snake River Dams, Jim Waddell, 9.19.2017](http://damsense.org/reports/Five%20Means%20for%20Breaching%204%20Lower%20Snake%20River%20Dams)
<http://damsense.org/reports/>

The BiOp, 02 EIS & New EIS



You will
love what
it says on
page 25.



<http://www.nww.usace.army.mil/Library/2002-LSR-Study/>

The 5 Polices or Means That Make Breaching Feasible in a Short Time Frame, Cont.

4. 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.

Details in Source Document [Five Means for Breaching 4 Lower Snake River Dams, Jim Waddell, 9.19.2017](http://damsense.org/reports/)
<http://damsense.org/reports/>

**The 5 Polices or Means That Make Breaching
Feasible in a Short Time Frame, Cont.**

5. Breaching the 4LSRD'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. And does not cost a billion or two, \$300-340 Million with contingencies for adaptive construction.



Lower Granite Dam with Channel Bypass

Break For Questions

Many More Slides If Needed