

# Snake River Juvenile Salmon Survival

# SPINS

you need to know

"Consider what's at stake if we fail to protect our vital hydropower infrastructure. Hundreds of millions of ratepayer dollars have successfully adapted it to accommodate record salmon runs, where an average of 97% of young salmon successfully make it past the dams."

-Congresswoman Herrera Beutler (WA-03) [1] in press release of June 29, 2017 supporting legislation to halt any changes in the operations of the lower Snake River dams.

SPIN 1

# 97%

Supporters of the status quo on the lower Snake River want the public to believe 97% of Snake River juvenile salmon and steelhead survive their migration over, through or around the eight dams standing between the juveniles' place of origin and the Pacific Ocean.

SPIN 2

# 95%

The U.S. Army Corps of Engineers describes Snake River juvenile survival as "trending towards a rate of 95%."

SPIN 3

# 66%

Dig deeper and you'll discover the 97% and 95% figures apply to each dam. Never mentioned is the fact that a 95% survival rate at each of eight dams results in a cumulative rate of 66%. However, this 66% cumulative survival rate includes only passage from the dams' forebays (upstream side of the dam) to their tailraces (on the downriver side of the dam).

The 66% cumulative survival rate does not capture the additional mortality that occurs in the large reservoirs behind the dams.

INCOMPLETE

# 50%

Conservationists and fish managers often speak of juvenile survival rates that do include both reservoir and dam passage.

While the numbers vary slightly by species and year, 50% is a common juvenile fish survival estimate through the dams plus the reservoirs.

**THESE ESTIMATES ALL HAVE SOMETHING IN COMMON: THEY ARE ALL INACCURATE OR INCOMPLETE IN DESCRIBING JUVENILE SNAKE RIVER SALMON SURVIVAL.**

Any informed discussion about the effects of the Federal Columbia River Power System on Snake River salmon requires facts, not spins.

*Does 50% survival reflect the best science on this topic?*

# THE REALITY: PART 1

Looking at National Oceanic and Atmospheric Administration [NOAA] 2018 data on juvenile fish survival [2], plus data gathered by fish scientists on river sections not included in NOAA's analysis, we can arrive at a more accurate estimate of the cumulative impact of the Federal Columbia River Power System on migrating juvenile Snake River salmon.

**1,000,000**

Let's follow a hypothetical migration of 1,000,000 Snake River juvenile spring/summer Chinook salmon downstream.

**900,000**

Let's make a conservative assumption that 90% of these fish survive their trip to the head of the reservoir above (upstream of) Lower Granite dam at Lewiston, Idaho. [3] Thus 900,000 of these juvenile fish enter slackwater thirty miles upstream from Lower Granite Dam.

**792,000**

NOAA estimates the 2018 survival rate from the head of slackwater through Lower Granite dam (the dam's tailrace) at 88%. That leaves 792,000 juvenile Chinook to continue downstream.

**580,536**

From Lower Granite's tailrace to the tailrace below McNary Dam on the Columbia River, NOAA estimates 2018 survival at 73.3%. That leaves 580,536 juvenile Chinook entering the next reservoir.

**250,792**

The survival estimate from the McNary Dam tailrace to the tailrace below Bonneville dam is 43.2%. That leaves 250,792 surviving juvenile Chinook.

**235,745**

NOAA's data includes mortality caused by avian and fish predation through the 8-dam hydropower system (to the Bonneville dam tailrace). But downstream from Bonneville, the last dam on the juveniles' journey, thousands of Double-Crested Cormorants and Caspian Terns, along with California and Ring-billed gulls, await the juveniles. These avian predators often launch their fishing flights from nesting islands the Walla Walla District of the U.S. Corps of Engineers created with dredging spoils.

A research study that used recovered pit tags deposited on bird nesting islands below Bonneville dam found terns and cormorants consumed an estimated 4.4% of remaining juvenile spring/summer Chinook. [4] The other bird species listed above added to those juvenile fish losses.

Predatory fish below Bonneville dam (pike minnow, bass, and walleye) also consume an unknown percentage of smolts. We can conservatively estimate a minimal combined avian-piscine predation on spring/summer juvenile Chinook at 6% as the juveniles travel below Bonneville dam to and through the Columbia River estuary. That leaves an estimated 235,745 of our hypothetical 1,000,000 juvenile Chinook as survivors.

**141,447**

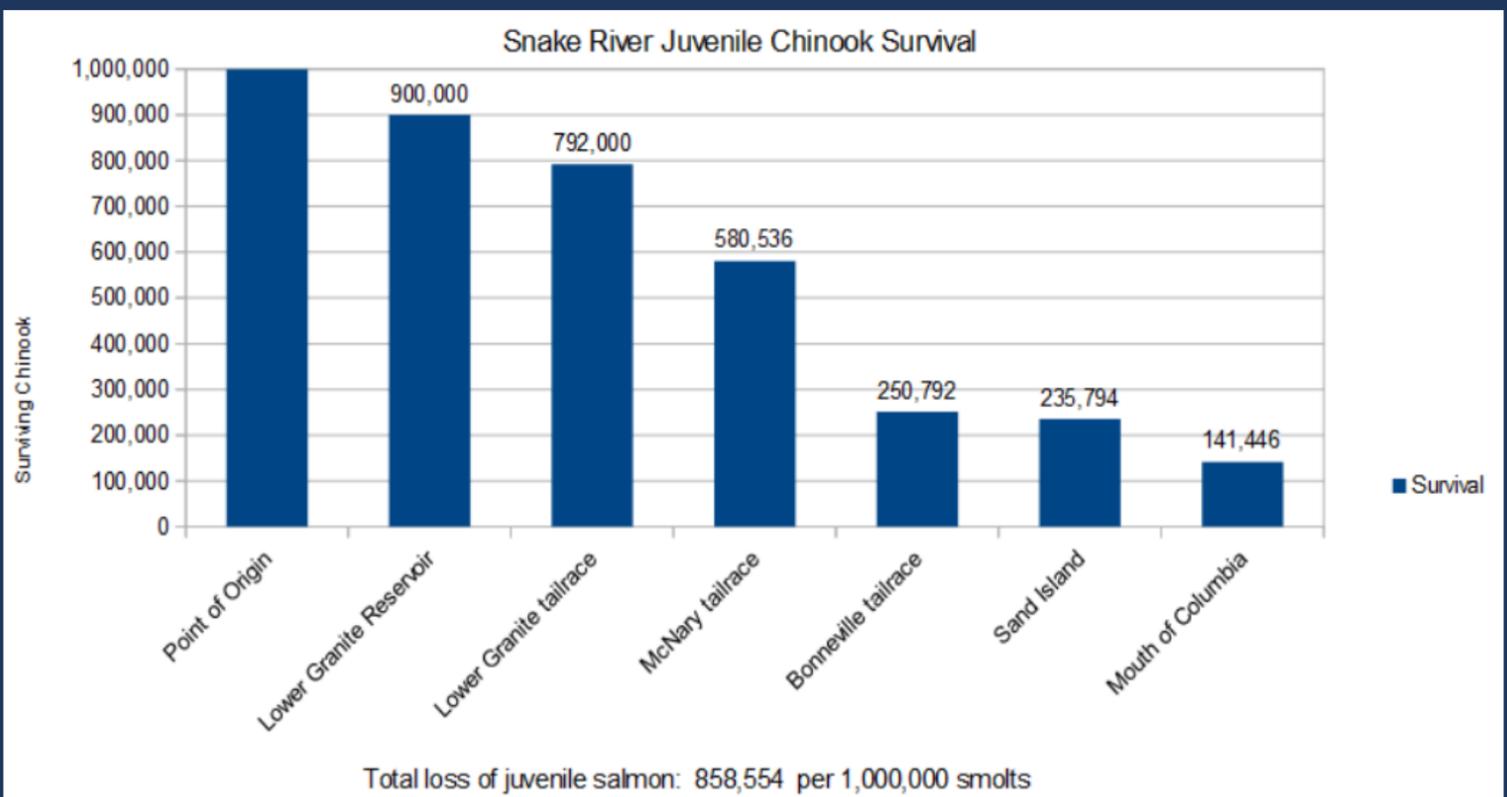
However, many of these survivors will suffer from what fish scientists call "delayed mortality," which refers to fish that die in the estuary after exiting the hydrosystem as a result of the cumulative stresses of negotiating their way through dams and reservoirs. These juvenile Chinook have run a gauntlet of turbines, bypass systems, mild to severe changes in hydraulic pressure, extended travel times, repeated stress, and sometimes life-threatening water temperatures.

Scientific studies estimate loss of juvenile Chinook to delayed mortality below Bonneville Dam ranges from 34%-76%. [5] From that range, using a conservative delayed mortality estimate of 40%, the surviving number of juveniles entering the ocean would be 141,447, just 14% of our hypothetical 1,000,000 smolts that began their journey in the Snake River watershed. Thus, an estimated 858,553 juvenile spring/summer Chinook salmon have perished. [6]

**14%**

of Snake River spring/summer Chinook salmon survive their perilous journey to the sea.

# THE REALITY: PART 2



Any claim of 95%-97% Snake River juvenile spring/summer Chinook salmon passage through the lower Snake and lower Columbia River hydro-system is pure balderdash and, we can only assume, an attempt to dupe the public.

Estimates of 66% represent only dam passage; that is, from each dam's forebay to its tailrace.

Posing a survival rate of 50% through dams and reservoirs fails to capture losses that occur in the slackwater behind Lower Granite dam and losses between Bonneville and the sea attributable to avian/piscine predation and delayed mortality.

To Be Accurate: the estimated loss of Snake River juvenile spring/summer Chinook salmon between hatchery or spawning grounds and the ocean stands at a likely minimum of 86%; survival at 14%.

And yes, electricity ratepayers across the Pacific Northwest spend millions of dollars each year producing millions of juvenile Snake River salmon and steelhead, only to have at least 85% die before they get to the sea.

According to the Fish Passage Center the Smolt-to-Adult Return [SAR] rate for Snake River ESA-listed Chinook salmon consistently remains below the 1% level needed for species survival. [7]

## NEED WE ANY LONGER WONDER WHY THESE FISH CONTINUE THEIR PATH – THEIR DECLINE – TO EXTINCTION?

### Sources :

[1] <https://mcmorris.house.gov/mcmorris-rodgers-herrera-beutler-newhouse-schrader-walden-introduce-legislation-address-fcrps-biological-opinion-2/>

[2] [http://pweb.crohms.org/tmt/agendas/2018/1003\\_2018\\_Preliminary\\_Survival\\_Estimates\\_Memo.pdf](http://pweb.crohms.org/tmt/agendas/2018/1003_2018_Preliminary_Survival_Estimates_Memo.pdf)

[3] NOAA reports the mean survival of hatchery Chinook from release site to Lower Granite Dam from 1998-2018 is 65.1%. The estimate in this document of 90% survival from place of origin to the head of the pool behind Lower Granite dam represents a minimal estimate of smolt loss.

[4] [http://www.birdresearchnw.org/Evans%20et%20al%202015\\_Avian%20Predation%20on%20AT%20smolts%20\\_Final%20Report.pdf](http://www.birdresearchnw.org/Evans%20et%20al%202015_Avian%20Predation%20on%20AT%20smolts%20_Final%20Report.pdf)

[5] [https://www.nrcresearchpress.com/doi/10.1139/cjfas-2013-0226#.XLo\\_jafMyis](https://www.nrcresearchpress.com/doi/10.1139/cjfas-2013-0226#.XLo_jafMyis)

see also:

<https://collaboration.idfg.idaho.gov/FisheriesTechnicalReports/Evidence%20Linking%20Delayed%20Mortality%20of%20Snake%20River%20Salmon%20to%20Their%20Earlier%20Hydrosystem%20Experience.pdf>

[6] One could argue that delayed mortality below Bonneville dam includes smolts eaten by avian and piscine predators as well as loss due to the cumulative impacts of dam and reservoir passage. I included avian and piscine-caused mortality below Bonneville to remind readers that juvenile salmon continue to be killed by predator birds and fish between Bonneville Dam and the sea. I thus used a percentage for delayed mortality at the low end of the range of research results.

[7] [http://www.fpc.org/documents/CSS/2018\\_Final\\_CSS.pdf](http://www.fpc.org/documents/CSS/2018_Final_CSS.pdf)

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