REGIONAL & NATIONAL IMPACTS TRIGGERED BY BREACHING LOWER SNAKE RIVER DAMS: SUMMARY OF TRANSPORTATION, CLIMATE AND SOCIAL JUSTICE CONCERNS

I. SUMMARY AND OVERVIEW

The breaching and related mitigation costs of four Lower Snake River Dams are conservatively expected to range from $10.3 to $31.3 billion (expressed in discounted 2022 dollars).[1]

This report focuses on two key elements associated with dam breaching — transportation/navigation impacts and irrigation/farm impacts.

Findings illustrate a significant direct impact on underserved populations. While this report discusses economic consequences of the economic, climate, and social justice impacts, it does not address the loss of power generation nor the financial costs of dismantling the earthen portion of the projects, nor the feasibility of funding the billions in transportation, infrastructure and other mitigation projects attributed to the consequences of dam breaching.

It is now clear that LSR dam breaching would have detrimental economic, climate and social justice impacts on local governments, communities, property owners, farmers, and businesses in Washington, Oregon, and Idaho.

Pacific Northwest Waterways Association contracted with FCS GROUP (financial and economic consultants) to provide an independent and economically conservative evaluation of the social/infrastructure/transportation/ farm impacts that would be caused by Lower Snake River (LSR) dam breaching and closure of four LSR locks.

The Columbia/Snake River system is the largest wheat export gateway in the U.S. Almost half of the wheat exports arrive by barges moving through the Columbia / Snake River system. Each year, over 4.2 million metric tons of commodities are estimated to move through the lower Snake River locks.

In 1945, Congress authorized the construction of four Lower Snake dams (Lower Granite, Little Goose, Lower Monumental, and Ice Harbor) as multiple-purpose projects to serve the Northwest's growing economy.

Report Organization

[1] Findings based on *Lower Snake River Benefit Replacement Final Report*, August 2022, a study prepared for Governor Jay Inslee and U.S. Senator Patty Murray of Washington.

Summary of Findings

The main objectives of these dams were and continue to be the creation of hydropower, transportation of freight (via river barge shipping for commodities moving from farms to domestic and global markets), and providing an adequate water table for irrigating the dusty but productive farmland along the Snake River. The four LSR locks and their dams were erected between 1957 and 1975 by the Army Corps of Engineers.

With the elimination of the Snake River barge transportation option and reduction in the aquifers that over 7,640 farms in Washington, Oregon, and Idaho depend upon, LSR dam breaching will fundamentally change this tri-state region.

This paper evaluates the expected economic and social justice impacts on 12 counties and several cities located in the tri-state region (see Figure 1).

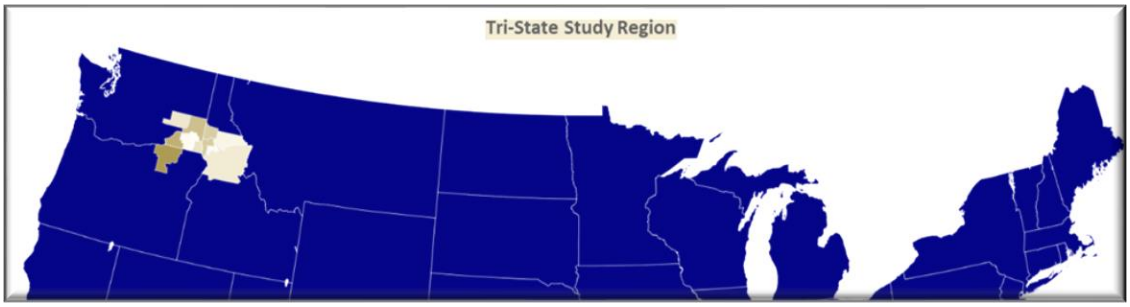


Figure 1: Tri-State Region Location Map

In 2021, Washington Gov. Jay Inslee and U.S. Senator Patty Murray commissioned a comprehensive study to describe the range of costs and benefits of the dams to inform decisions about whether the dams should be retained or breached. The estimated replacement and mitigation costs from that comprehensive study range from $10.5 to $65.7 billion, as shown in **Exhibit 1**.

Exhibit 1. Summary of Dam Replacement and Mitigation Costs

Impact Category		Low Est.		High Est.
Energy		$8.3 B	to	$56.9 B
	Source:	*Energy Strategies (2022)*		*Energy GPS (2022)*
Breaching		$1.2 B	to	$2.0 B
	Source:	*CRSO EIS*		*Simpson Proposal*
Navigation & Transportation		$0.54 B	to	$4.8 B
		EcoNW		*FCS (2020)*
Irrigation		$0.19 B	to	$1.0 B
	Source:	*EcoNW*		*US Army Corps of Engineers*
Recreation		$0.19 B	to	$1.0 B
	Source:	*EcoNW*		*US Army Corps of Engineers*
Total		**$10.5 B**	**to**	**$65.7 B**

Source: Lower Snake River Dams, Benefit Replacement Report, August 2022.

II. SOCIAL JUSTICE CONCERNS

This study defines the regional market area that would be directly impacted by the breaching alternative as 12 counties that are generally within a two-hour drive of the ports of Lewiston and Clarkston. This includes six (6) Washington counties, five (5) Idaho counties, and one (1) Oregon county. These counties primarily include rural agricultural areas that depend heavily upon the LSR locks and barge transportation systems for the movement of wheat, fuel, and other bulk products.

Local Counties Directly Affected by Dam Breaching

State	# of Counties	Population (2021)	Notes
Oregon	1	80,075	Includes Umatilla County
Washington	6	159,693	Includes Adams, Asotin, Columbia, Garfield, Walla Walla and Whitman counties
Idaho	5	110,415	Includes Clearwater, Idaho, Latah, Lewis and Nez Perce counties
TOTAL	**12**	**350,183**	

Findings contained in this study rely upon most current data provided by the U.S. Census, the White House Climate and Economic Justice Screening Tool, the U.S. Department of Agriculture, the Federal Reserve Bank, and the United Way to ascertain environmental and social justice issues.

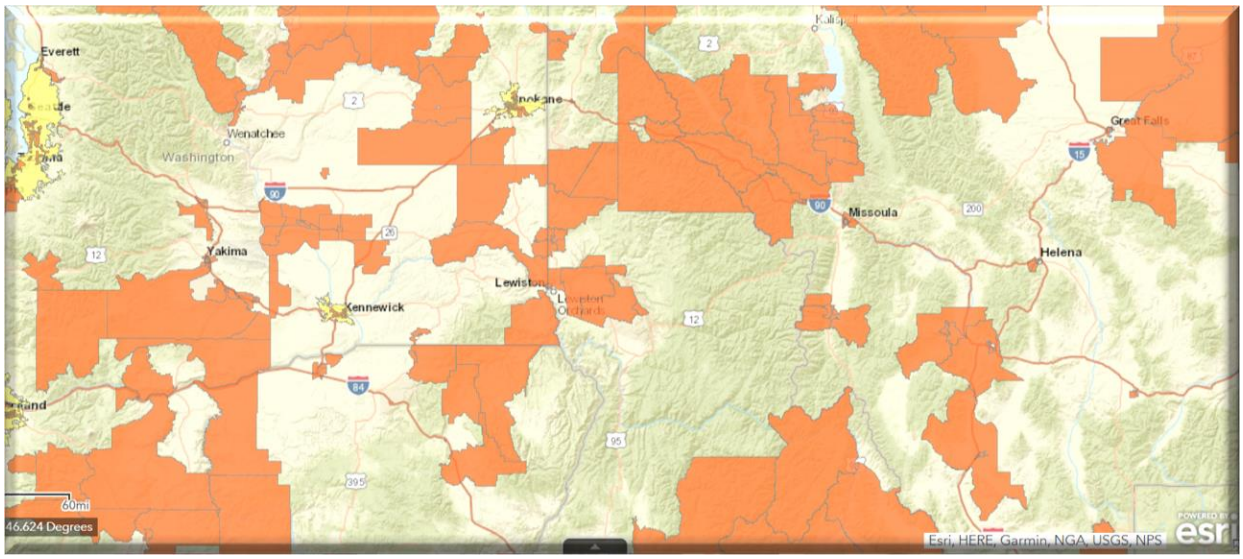
Appendix B provides social-economic comparisons between the tri-state study region and the nation.

Overall findings illustrate that the dam breaching alternative would exacerbate existing climate and social justice issues in a tri-state region that includes 350,183 people and 90,124 jobs. Existing social justice concerns are expected to grow exponentially should the land be left without a reliable, consistent supply of water.

Social Justice Findings:

- The tri-state study region includes 350,183 residents (*U.S. Census, ACS, 2021*). The majority of residents are White (83.5%). Other races include Latino/Hispanic (17.2%) and American Indian (2.03%).
- The share of the study region's population that is disabled (15.3%) is higher than the national average (13%).
- The median age of the region's residents is older (41.2) than the national median (38.8).
- Net cash income for farms reporting receipts averaged only $52,695 in 2017.
- In addition to households experiencing poverty (16.5%), United Way indicates that 31% of the study region's households are Asset Limited Income Constrained and Employed (ALICE). The combination of poverty and ALICE measurements indicate that nearly half of all households in the region are living "on the edge" — going paycheck to paycheck to make ends meet in light of relative housing, childcare, health care, and transportation costs.
- Regional income is lower, and poverty rates are higher in the study region compared with the nation. In 2021, 16.5% of the study region's residents between the age of 18 and 64 were below the poverty level — compared to 11.9% for the nation. **Exhibit 2** reflects Census Tracts within the region with "Persistent Poverty."

Exhibit 2. Persistent Poverty Census Tracts, LSR Region

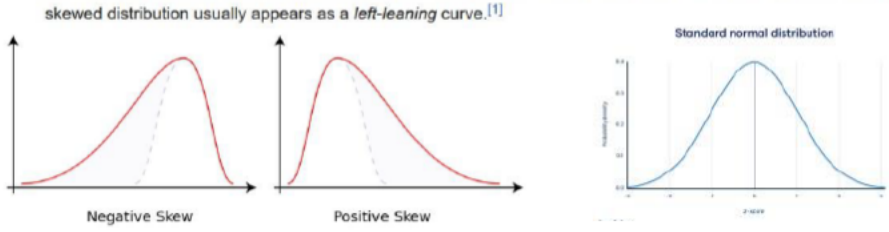


Source: https://maps.dot.gov/BTS/GrantProjectLocationVerification/

- Home ownership rates in the region (58.7%) are lower than the national average (69.4%).
- The share of regional households experiencing severe rent burden (with over half of the annual income paid towards housing) is higher (24.4%) than the national average (22.9%).
- The share of households participating in SNAP (Supplemental Nutrition Assistance Programs) is higher in the study region (13.4%) than the nation (12.3%).
- The share of unemployed civilians in the region is higher than the national average. The crucial jobs at risk of being lost include hard-working haulers, planters, pruners, and harvesters -- all essential for providing agricultural produce to consumers. They are already in short supply with first-generation Americans, seasonal farm workers, and disadvantaged workers.
- According to current White House Climate and Social Justice data, the **region is at a relative disadvantage in terms of unemployment, poverty, energy cost burdens, risk of natural hazards (such as fire), asthma, and travel barriers** *(source: White House Climate and Economic Social Justice Screening Tool).* See **Exhibit 3**.

1. *negative skew*: The left tail is longer; the mass of the distribution is concentrated on the right of the figure. The distribution is said to be *left-skewed*, *left-tailed*, or *skewed to the left*, despite the fact that the curve itself appears to be skewed or leaning to the right; *left* instead refers to the left tail being drawn out and, often, the mean being skewed to the left of a typical center of the data. A left-skewed distribution usually appears as a *right-leaning* curve.[1]
2. *positive skew*: The right tail is longer; the mass of the distribution is concentrated on the left of the figure. The distribution is said to be *right-skewed*, *right-tailed*, or *skewed to the right*, despite the fact that the curve itself appears to be skewed or leaning to the left; *right* instead refers to the right tail being drawn out and, often, the mean being skewed to the right of a typical center of the data. A right-skewed distribution usually appears as a *left-leaning* curve.[1]

How to interpret *White House Climate and Economic Social Justice Screening Tool Statistics shown on next exhibit*



(1) Illowsky, Barbara; Dean, Susan (27 March 2020). "2.6 Skewness and the Mean, Median, and Mode - Statistics"

Exhibit 3: Climate and Social Justice Screening Tool: Indicators for the Tri-state Study Region

Notable Statistics	Tri-State Study Region	National Median	Study Region Deviation
Unemployment	55.34%	50.00%	-5.34%
Percent of individuals < 100% Federal Poverty Line (percentile)	57.83%	50.00%	-7.83%
Energy burden (percentile)	55.37%	50.00%	-5.37%
Expected population loss rate (Natural Hazards Risk Index) (percentile)	63.74%	50.00%	-13.74%
Share of properties at risk of fire in 30 years (percentile)	79.15%	50.00%	-29.15%
Current asthma among adults aged greater than or equal to 18 years (percentile)	71.2%	50.00%	-21.15%
DOT Travel Barriers Score (percentile)	52.83%	50.00%	-2.83%

Source *: White House Climate and Economic Justice Screening Tool*

These major climate and social justice concerns will grow exponentially should the land be left without a reliable, consistent water supply.

Local and State Economic Impacts of Dam Breaching

LSR dam breaching would significantly reduce river and groundwater levels, negatively impacting business establishments, especially farmers, industrial employers, and Lewiston/Clarkston area cruise ship operations. Concerns range from the inability to irrigate crops to logistics of shipping commodities and products from manufacturing firms through existing port terminals, mitigation costs for wastewater outfalls, and new investments in water intakes, filtration and pumping/transmission systems.

Summary of Findings

The region's economy is centered on agriculture, with 7,644 farms that generate $2 billion in annual sales (U.S. Dept. of Agriculture, 2017 Census of Ag.). It should be noted that the Ag. Census is published once every 5 years, and the region's economic output level is expected to be much higher today than it was 5 years ago.

In comparison with the nation, the tri-state region's gross domestic product is nearly 10 times more dependent on agriculture than the national average. The number of jobs that are at risk represents approximately 15% of the regional workforce. (IMPLAN, 2020).

Fragile regional economies are at-risk with LSR dam removal and any reduction in the underground aquifer water table. At-risk agricultural exports (primarily wheat) shipped from the Snake River to ocean ports support over 14,000 regional jobs and generate over $30 million in federal tax revenues annually. The number of jobs that are at risk represents 15% of the regional workforce.

Removal of the LSR locks, even if phased in over many years, will permanently lead to direct negative economic and social justice impacts in the region as well as the nation as a whole:

- **Removal of the locks will likely bankrupt thousands of farms** (producers) as they attempt to change their freight distribution network from efficient river barges to far more costly long-haul truck or rail service.
- T**he existing highway and rail network would need a short-term capital investment of $1.3 billion to handle the 4.2 million tons of annual shipments to and from the tri-state region.** *(Source: Appendix A, engineering cost estimates prepared for the Washington Transportation Commission, adjusted to 2023 dollars).*
- If billions in federal dollars were somehow appropriated to increase the highway and rail capacity and address required local street and infrastructure needed to mitigate the impact of LSR locks/dam removal, the **design and permitting time would take several years, and inflationary pressure would push these cost estimates up even higher.**
- Potentially shifting commodity exports from barge to truck and rail would increase the overall cost of shipping commodities to export terminals along the Pacific**. Moving commodities by truck/rail would increase the cost per bushel of wheat by 8% or more. An increase in the wholesale cost of grain would push the breakeven price for grain up to nearly $8.00 per bushel — well above the spot price of $7.19 in today's market** (*per USDA, Wheat Index, July 26, 2023*).
- **Because the market price for grain is determined by global factors such as international demand, global supplies, and currency rates, increasing wholesale prices for commodities is not an option and has a high probability of bankrupting over 7,600 farms unless U.S. farm subsidies to the tri-state region increased by $55M/year or $1.65 billion over 30 years** *(FCS Group estimates).*
- Removal of the LSR dams would also impact underground aquifers by requiring irrigation water for crops to be pulled from groundwater sources. Non-irrigated cropland in this region is inhospitable for food production. **With nearly 352,000 acres of irrigated farmland in the tri-state region, the loss of irrigated farmland would conservatively reduce land value**

by at least $1.1 to $1.6 billion *(values reported by the USDA, Land Values Summary, Aug. 2022).*

- As farmland valuation is reduced, local assessed values will decline in the tri-state region. This will in turn reduce local property tax revenue by over $17 million per year in the tri-state region — $520 million over 30 years. **The consequential negative fiscal impact would devastate local municipalities, schools, emergency services, hospitals, libraries, and special districts — as municipal and county tax revenue is reduced by $12M/year ($360M over 30 years) and public-school tax revenue is reduced by $6M/year ($180M over 30 years) in the tri-state region.**
- In addition to direct losses associated with reduced agricultural capacity, the 12-county region will experience significant secondary losses. **Every agricultural job in the region results in just under two additional secondary jobs, and every $1 of agricultural GDP produced in the region results in $5 in secondary GDP,** according to IMPLAN modeling performed for this study.
- Regional farm and government sectors account for nearly 15% of the tri-state GDP with 15,700 jobs. The **long-term permanent job losses in the tri-state region attributed to LSR breaching are difficult to quantify but would likely place over 15,000 jobs at risk. The secondary and tertiary impacts of these job losses would be far more significant.**
- **The Port of Clarkston has identified four specific cruise lines and seven vessels at risk, which support thousands of workers**[2]. These **cruise lines will cease ALL operations if the Snake River portion of the waterway is unavailable. This would cause a ripple effect on local economies and at several ports of call along the lower Columbia River in Oregon and Washington.**
- At least three cities (Clarkston, Lewiston, and Asotin), regional counties, and major industrial businesses have permits to discharge treated wastewater into the river. A share of the economic contribution of these communities will be at-risk with dam breaching, with nearly $1.5 billion in combined annual GDP. Note, this is a conservative estimate of the regional GDP since many other communities in Washington and Idaho will also be impacted.

III. TRANSPORTATION CONCERNS

This analysis is consistent with the 2023 benefit-cost analysis (BCA) guidelines prescribed by the U.S. Department of Transportation (*US DOT*). Findings are used to define outcomes from local perspectives (social justice concerns and reductions in employment, farm output/sales, property value

[2] October 2020 Lewis Clark Valley Cruise Boat Industry Economic Impact Assessment

and government revenue), regional impacts (transportation/freight impact) and national (transportation and infrastructure cost, air quality, safety, tax revenue) perspectives.

The findings are based on the recent BCA Analysis of the LSR Dam Removal provided by FCS GROUP, with updates to prior assumptions to reflect current 2023 construction costs (*based on McGraw Hill Engineering News Record, Seattle Construction Cost Index*) and benefit-cost factors provided by US DOT (*Benefit Cost Analysis Guidelines, Jan. 2023*).

The 1992 drawdown experiment concluded that existing wastewater infrastructure would be damaged or rendered useless as the river level drops. The river drawdown would impact local infrastructure such as roadways, public docks, outfalls, stormwater infrastructure, and various public and private capital investments, as well as land values. These costs would have significant fiscal impacts on local and state governments and the nation.

This analysis conservatively excludes additional local, regional, and national costs associated with the following:

- **The construction cost of dam breaching and related access changes**
- **Truck and rail costs associated layover time**
- **Rail safety/accident costs**
- **Replacement of hydropower capacity and transmission facilities**
- **Water supply and wastewater discharge facility costs to municipal and industrial users**
- **Investment in new transloading storage facilities and short-line rail connections**
- **Loss of revenues at the ports of Lewiston and Clarkston and potential closure of the Lewiston airport, which relies heavily upon cruise ship patronage to remain open**
- **Regional (non-agricultural) economic development dislocation costs**

Findings from the national transportation benefit-cost analysis are summarized in Appendix C and include:

- The **removal of four lower Snake River dams will increase transportation and related environmental costs in the U.S. by well over $7.3 billion over 30 years. This equates to a net present value of approximately $4 billion** (based on a standard 7.0% annual discount rate).
- **Removing the Snake River locks would cause diesel fuel consumption to increase by nearly 5 million gallons per year** as barges are replaced by less efficient truck-to-rail shipments.
- The current distribution of commodities moving out of the 12-county tri-state region to deep draft export ports are as follows: 90% barge and 10% rail. With the removal of the LSR locks, commodities transported by barge would no longer exist — as producers try to shift commodity freight from efficient river barge to truck and rail.
- Bulk commodities are shipped out of and into this study region utilizing three modes of transportation: river, road, and rail:
    - two public transportation options (US highway system and the M-84 inland river navigation system); and

    - one private transportation option (rail)
- Removing one of the public systems is problematic when the privately owned system controls management, capacity, and rates.
- **Even if billions in federal and state transportation mitigation were appropriated, LSR dam breaching would require at least 201 additional unit trains and 23.8 million miles in additional trucking activity annually**. However, unit trains of commodities from Montana and the Dakotas will take priority over any shipments originating in the study region as Class 1 rail operators see higher profits on shipping longer distances. Hence, a greater demand for rail service will significantly increase transportation costs for ALL regional shippers.
- **Freight rail is already the leading cause of passenger rail delays in the U.S.[3], a condition which would worsen with increased use of freight rail in the region.**

Increased truck and rail traffic will result in more fatalities and related costs

Related engineering studies have concluded that **over $1.3 billion in infrastructure investments would need to be constructed in the near term to address transportation, railroad, grain storage capacity, and local infrastructure changes that would result with LSR dam breaching.** No funding for these improvements has been identified and these improvements would not be required if the LSR locks remain operational.

Increased reliance on truck-to-rail or truck-to-barge terminal shipping is expected to result in an increase of 23.8 million miles of travel per year on county, state, and federal highways. **The increased trucking activity will increase fuel costs, highway maintenance costs, terminal facility maintenance costs, driver time, and vehicle maintenance costs by over $69 million per year.**

Diesel fuel consumption will increase by nearly 5 million gallons per year, thereby reducing our nation's ability to achieve energy independence.

Additionally, residents of the study region are within the 71st percentile of asthma patients in the nation, according to the White House Climate and Economic Justice Screening Tool. Further diesel pollution will exacerbate that condition.

An increase in unit trains of 1-2 per day enhances the probability of train-related incidents and fatalities; the cost of train safety incidents have not been included in this study. A similar train derailment recently occurred in the

Figure 2. Recent unit train derailment in Mosier, Oregon (2016).

[3] https://www.amtrak.com/on-time-performance

City of Mosier, Oregon — spurring fire and emergency response (*Figure 2*).

IV. CLIMATE IMPACTS

Negative air quality emissions would result from dam breaching— creating unintended consequences.

Shifting commodity flows from barge to truck and rail will result in increases in NO_x, CO_2, and other harmful emissions by over 1,251,000 tons per year (*source: Appendix C, FCS Group*).

This annual amount of harmful air emissions is equivalent to the following:

- **Removing 6,927 acres of trees through deforestation or**
- **Adding 181,889 passenger cars or**
- **Adding 90,365 standard-size homes or**
- **Adding one large coal-fired power plant every 2-3 years — such as the recently decommissioned PGE plant in Boardman, Oregon (Figure 3).**

Figure 3. The Boardman Coal Fired Power Plant in NE Oregon was closed in 2020. According to PGE, the plant produces about 2 million tons of greenhouse gas emissions annually.

While this study focuses on quantifiable climate impacts, there are unknown environmental risks to humans, fish, and wildlife from the potential for hazardous materials such as PCB (polychlorinated biphenyl) compounds, used in the construction of the dams, to leak or leach into the river and air during the dam decommissioning process (*source: PGE*).

Photographs from 1992 Snake River Drawdown *(credit: Port of Lewiston)*

For questions regarding this study, please contact the Executive Director of Pacific Northwest Waterways Association at www.pnwa.net

Appendix A: Regional Transportation and Infrastructure Mitigation Costs

Transportation & Infrastructure Improvements Required with LSR Dam Removal (millions)	Low Estimate (2023 $)	High Estimate (2023 $)	Midpoint Estimate (2023 $)
Major Roads			
Bridge and Road Repair*	$97	$387	$241.6
State Road Improvements*	$169	$203	$186.2
Rail and local Infrastructure improvements			
Rail Facilitiy Improvements*	$366	$431	$398.7
Other Local transportation and infrastructure facility improvements**	$49	$73	$61.1
Subtotal	$681	$1,094	$887.6
Standard contingency (@20%)	$136	$219	$177.5
Total Capital Cost	$817	$1,313	**$1,065.1**

Notes

***** *Lund Consulting and HDR Engineering, LSR cost mitigation study for Washington State Legislative Committee.*

*** Cost assumptions allowance based on stakeholder interviews to account for other local infrastructure (roads, water, storm, sewer, riverbanks).*

****Escalation rate based on McGraw Hill Seattle ENR Construction Cost Index, 1998-2023 time frame.*

Appendix B: Regional Demographics and Socio-Economic Data

Tri-State Study Region (Direct Impacts)

State	# of Counties	Population (2021)	Notes
Oregon	1	80,075	Includes Umatilla County.
Washington	6	159,693	Includes Adams, Asotin, Columbia, Garfield, Walla Walla and Whitman counties
Idaho	5	110,415	Includes Clearwater, Idaho, Latah, Lewis and Nez Perce counties
TOTAL	**12**	**350,183**	

Lower Snake River - Socio-Economic Analysis
Demographic Research
Census of Agriculture 2017

	Tri-State Study Region
Farm Operations - Number Of Operations	7,644
Farm Operations - Number Of Operations Area Operated: (1.0 To 9.9 Acres)	1,525
Farm Operations - Number Of Operations Area Operated: (10.0 To 49.9 Acres)	1,759
Farm Operations - Number Of Operations Area Operated: (50 To 179 Acres)	1,304
Farm Operations - Number Of Operations Area Operated: (180 To 499 Acres)	917
Farm Operations - Number Of Operations Area Operated: (500 To 999 Acres)	560
Farm Operations - Number Of Operations Area Operated: (1,000 Or More Acres)	1,579
Farm Operations - Acres Operated	6,624,453
Farm Operations - Area Operated, Measured In Acres / Operation	11,064
Farm Operations - Area Operated, Measured In Acres / Operation, Median	1,967
Ag Land, Incl Buildings - Asset Value, Measured In $ / Operation	19,437,750
Ag Land, Incl Buildings - Asset Value, Measured In $ / Acre	22,751
Machinery Totals - Asset Value, Measured In $	1,408,405,000
Machinery Totals - Asset Value, Measured In $ / Operation	2,158,102
Ag Land, Cropland - Number Of Operations	5,735
Ag Land, Cropland - Acres	4,417,625
Ag Land, Cropland, Harvested - Number Of Operations	4,319
Ag Land, Cropland, Harvested - Acres	2,668,950
Ag Land, Irrigated - Number Of Operations	2,211
Ag Land, Irrigated - Acres	351,965
Commodity Totals - Sales, Measured In $	1,865,375,000
Commodity Totals - Sales, Measured In $ / Operation	2,554,654
Crop Totals - Sales, Measured In $	1,074,908,000
Animal Totals, Incl Products - Sales, Measured In $	264,229,000
Commodity Totals - Operations With Sales	7,644
Corn, Grain - Operations With Area Harvested	137
Wheat - Operations With Area Harvested	1,872
Oats - Operations With Area Harvested	35
Barley - Operations With Area Harvested	320
Soybeans - Operations With Area Harvested	8
Hay & Haylage - Operations With Area Harvested	2,361
Sunflower - Operations With Area Harvested	12
Vegetable Totals, In The Open - Operations With Area Harvested	256
Potatoes - Operations With Area Harvested	74
Orchards - Operations With Area Bearing & Non-Bearing	363

Lower Snake River - Socio-Economic Analysis

Demographic Research

USDA Agricultural Data

Irrigated and Non-Irrigated Cropland Average Value per Acre - States: 2018-2022 (continued)

	2018	2019	2020	2021	2022	% Change (2021-2022)
Idaho, all cropland	$3,740	$3,930	$4,070	$4,450	$4,950	11.20%
Irrigated	$5,690	$6,020	$6,210	$6,800	$7,550	11.00%
Non-irrigated	$1,590	$1,650	$1,720	$1,890	$2,100	11.10%
Washington, all cropland	$2,630	$2,630	$2,610	$2,700	$2,940	8.90%
Irrigated	$7,930	$7,690	$7,650	$7,800	$8,400	7.70%
Non-irrigated	$1,260	$1,260	$1,240	$1,310	$1,450	10.70%
Oregon, all cropland	$3,000	$3,080	$3,120	$3,310	$3,650	10.30%
Irrigated	$5,180	$5,290	$5,430	$5,800	$6,350	9.50%
Non-irrigated	$2,200	$2,220	$2,220	$2,340	$2,600	11.10%

Source

USDA Land Value Report, Aug. 2022.

Lower Snake River - Socio-Economic Analysis

Demographic Research

Social Justice ACS 2021 5-Year

Census Table Referenced		Tri-State Study Region	National Data
P1	Population	350,183	331,449,281
	White pop	292,254	204,277,273
	White Share	83.5%	61.6%
	Non-White share	16.5%	38.4%
	American Indian and Alaska Native Alone	7,107	3,727,135
	American Indian and Alaska Native Alone % of Pop	2.03%	1.12%
	Latino/Hispanic pop	60,081	62,080,044
	Latino/Hispanic share	17.2%	18.7%
S1601	Population that Speaks a language other than English	50,066	67,203,410
	% of pop Language other than English	14.3%	21.6%
S1810	Disabled Pop	53,481	41,055,492
	Disabled share	15.3%	13.0%
S2101	Veteran Pop	22,342	17,431,290
	Veteran share	6.4%	6.4%
DP05	# of Pop over age 65	59,656	52,888,621
	% of Pop over age 65	17.0%	16.8%
	Median Age	41.2	38.8
	Source: U.S. Census, American Community Survey, 2021 (Appendix B).		
S1701	Population for whom poverty Status is determined	326,599	321,897,703
	Population in Poverty	49,162	40,661,636
	% of People in Poverty share	15.1%	12.6%
	Under 18 Population	74,476	72,996,065
	Under 18 Population below poverty level	11,973	12,443,424
	% Under 18 Population below poverty level	16.1%	16.9%
	18 to 64 Population	194,125	197,195,974
	18 to 64 Population below poverty level	32,077	23,280,096
	% 18 to 64 Population below poverty level	16.5%	11.9%
	65 and Over Population	57,998	51,705,664
	65 and Over Population below poverty level	5,112	4,938,116.0
	% 65 and Over Population below poverty level	8.8%	10.3%
S1901	Median HH Income	$ 54,865	$ 69,717
	Population of legal working age (16 or older)	281,716	264,087,642
	In labor force	164,371	167,869,126
	Employed	154,337	157,510,982
	Unemployed	9,642	9,161,615
	In Armed Forces	392	1,196,529
	Not In Labor Force	117,345	96,218,516
DP03	Employment Rate	58.3%	63.6%
	Avg Travel Time to Work (min)	19.5	25.6
DP04	Home Ownership Rate	58.7%	69.4%
	Median Gross Rent	$ 798	$ 1,191
B25070	# Of Renters	46,511	43,858,831
	Rent Burden HH #	21,267	20,169,402
	Rent Burden HH Share	45.7%	46.0%
	Severe Rent Burden HH #	11,340	10,048,573
	Severe Rent Burden HH Share	24.4%	22.9%
B19058	# of HHs	130,133	124,010,992
	# of Households w/ SNAP	17,395	15,297,335
	SNAP Participation rate	13.4%	12.3%

Appendix C: National Transportation and Environmental Benefit – Cost Analysis Summary

Lower Snake River Dam Breaching Alternative

Transportation, Infrastructure and Farm Subsidy Impact Analysis Summary (national costs)

	Amount	Source Note
Outbound Commodity Freight through LSR locks, 2017 (short tons)	2,623,000	1
Inbound Commodity Freight through LSR locks, 2017 (short tons)	874,000	1
Economic Competitiveness, Change of Freight Movements	**Annual Change over No Build (no discount rate)**	
Change in Barge Miles	(144,877)	2
Change in Rail Miles	52,319	2
Change in Truck Miles	23,809,595	2
Change in Barge Ton-Miles	(1,014,136,000)	2
Change in Rail Ton-Miles	522,808,000	2
Change in Truck Ton-Miles	561,592,400	2
Net Change in Fuel Required (gallons)	4,665,973	2
Capital & Maintenance Investment (annual average)		
Annualized Capital Cost of Transportation	($38,490,398)	3
Annualized Capital Cost of Rail/Barge Terminals	($28,112,441)	3
Annualized Capital Cost of Local Infrastructure	($4,784,744)	3
Net Annual Change in Fuel Costs (@$3 per gallon)	($13,997,919)	2
Net Annual Barge/Rail Terminal Maint. & Replacement Reserve	($13,938,849)	2
Net Annual Truck Maintenance Cost	($27,503,344)	2
Net Annual Highway Maintenance Cost & Replacement Reserve	($13,333,373)	2
Safety Impacts (annual average)		
Change in Truck Accident costs (injuries)	($4,052,191)	2
Change in Truck Accidents costs (fatalities)	($3,174,771)	2
Net Environmental Impacts, Annual Emissions (tons)		
Carbon Dioxide (CO_2)	855,445	2
Carbon Monoxide (CO)	70	2
Volatile Organic Compounds (VOC)	7	2
Nitrogen Oxide (NOx)	306	2
Particulate Matter (PM)	7	2
Net Environmental Impacts, Annual Cost of Emissions		
Carbon Dioxide (CO_2)	($54,748,462)	2
Volatile Organic Compounds (VOC)	($17,068)	2
Nitrogen Oxide (NOx)	($5,805,704)	2
Particulate Matter (PM)	($6,808,705)	2
Net Change in Federal Direct Payments to farmers		
Annual direct payment to farmers (to achieve neutral profit condition)	($54,910,412)	5
Summary of Cost Impacts, Annual Cost		
Transportation & Infrastructure Capital Cost	($71,387,582)	4
Transportation & Infrastructure Maintenance Cost	($27,272,222)	
Transportation Fuel Cost	($13,997,919)	
Truck Maintenance Cost	($27,503,344)	
Truck Safety Impact Cost	($7,226,963)	
Environmental Air Quality Cost	($67,379,939)	
Net Change in Local Property Tax Revenue (midpoint estimate)	($11,549,735)	
Summary of Annual Impacts (Costs)	**($226,317,704)**	
Permanent Decrease in Farm Value due to loss of irrigation (midpoint)	**($1,051,000,000)**	7
Value of Transportation and Infrastructure in Year 30		
Remaining life of capital assets in year 30	**$634,481,517**	3
Residual Value of Transportation & Infrastructure Investments in Year 30	**$634,481,517**	6
NPV of 30-year Impacts (no discount rate)	**($7,251,000,000)**	rounded
NPV of 30-year Impacts (w/ @7% annual discount rate)	**($3,751,000,000)**	rounded

Notes to table

1) Reflects 2017 freight volume through Lower Snake River locks, U.S. Army Corps. of Engineers.

2) Based on assumptions consistent with U.S. Dept. of Transportation, Benefit Cost Analysis Guidance for Discretionary Grant Projects, Office of the Secretary, Jan. 2023, and U.S. Dept. of Transportation, Benefit-Cost Analysis Guidance for Rail Projects, June 2016.

3) Based on capital improvement cost estimates for transportation, bridges, rail and local roads/infrastructure.

4) Upper end estimates included in table; excludes unknown net costs associated with breeching four LSR dams, power supply/transmission impacts, and any related regional economic development dislocation costs.

5) Assumes midpoint of expected increase in shipping/transportation cost to farmers in 10-county region.

6) Assumes 60-year life cycle for major transportation/rail investments and 40-year life cycle for local infrastructure investments.

7) Analysis based on decrease in irrigated farm acres using USDA values and estimates.