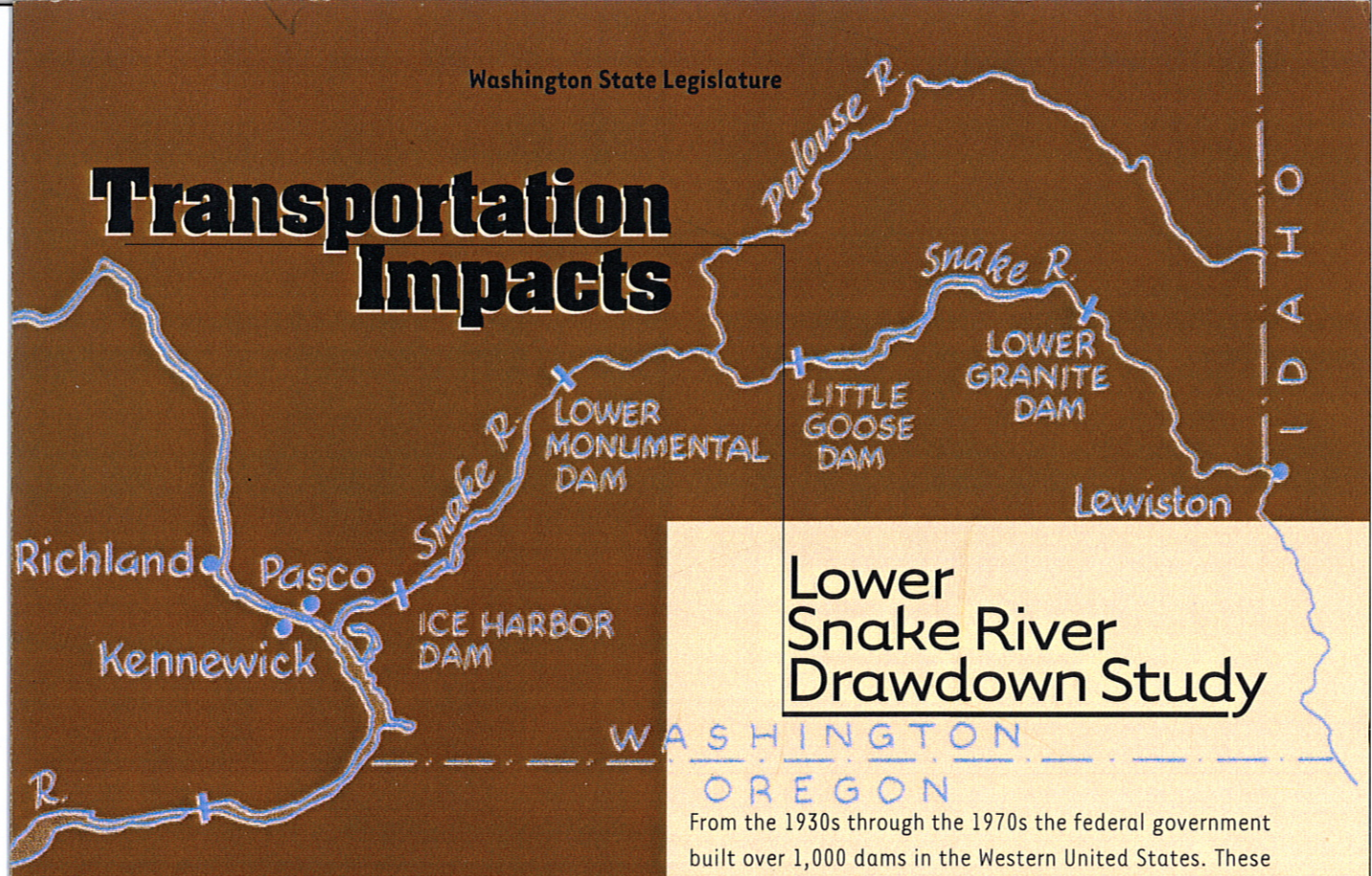
Washington State Legislature

Transportation Impacts



Lower Snake River Drawdown Study

From the 1930s through the 1970s the federal government built over 1,000 dams in the Western United States. These multipurpose dams were used for irrigation, flood control, hydroelectric power, and navigation. Among the last to be built were four dams on the lower Snake River in Washington State. By the time the last of these dams had been completed in 1975, ports as far inland as Lewiston, Idaho had been opened to oceangoing navigation. Washington wheat and other commodities were shipped by barge down the Snake River to Portland and southwest Washington ports, and from there to the entire world.

In 1992, following a petition by the Shoshone-Bannock tribe, the Snake River sockeye salmon and the spring/summer and fall chinook salmon were listed as "endangered" under the Endangered Species Act. Such action has triggered an analysis by the federal government of the four dams—Ice Harbor, Lower Monumental, Little Goose, and Lower Granite — for possible permanent drawdown as one alternative to prevent extinction of these species.

Drawdown, or breaching, of the dams will result in the end of barge shipping on the lower Snake River and will shift the movement of commodities in eastern Washington from barge to truck or rail. Estimates of transportation-related costs of dam drawdowns in Washington State vary widely, depending upon geo-technical considerations. Costs could total $132 million to $406 million.

prepared for
Washington State Legislative Transportation Committee
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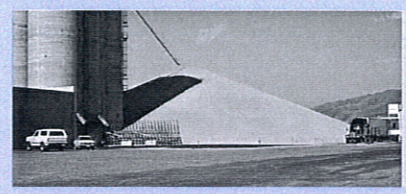


Commodities of Note

Wheat and barley constitute nearly 75% of the volume of 4.4 million tons of commodities barged annually on the lower Snake River.

	volume *(in tons)*	direction
wheat and barley	3,200,000	downstream
wood products	590,000	downstream
containers	458,000	downstream
petroleum	115,000	upstream
fertilizers	33,000	upstream

Geo-technical Impacts

As the dams are drawn down and the level of the river is lowered, saturated soil in nearby embankments will be drained of water. Many of these soils are already compromised, as the man-made embankments were constructed of random, uncompressed material. Water will flow back into the river through rock joints and cracks, and through the embankments. Depending on the rate of drawdown, this movement of water could result in reduced soil strengths and slope instability, or worse, slope failure. Slope failures would impact adjacent roadways and railroads, and may cause damage ranging from soil settlement to catastrophic landslides.

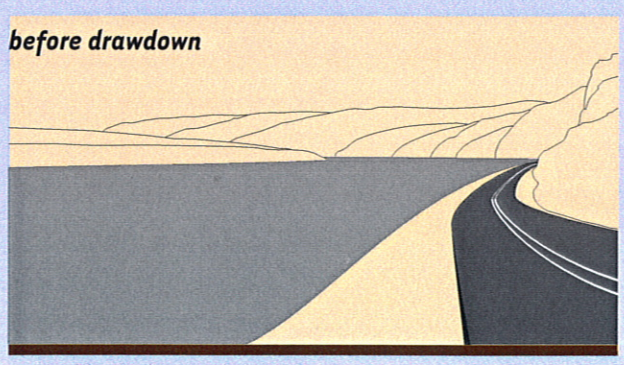
Additionally, bridge foundations may also be impacted. Increased river velocity and lateral movement caused by a drawdown may contribute to instability of the foundations.

The costs of these geo-technical impacts range from $48 million to $192 million.

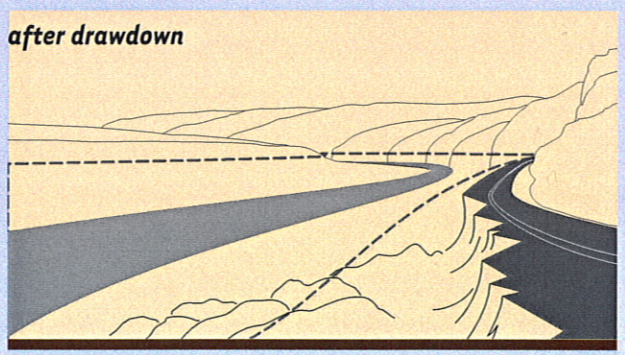
Soils Stabilization Costs in millions*

Unit & Location	Mitigation[1] low	Mitigation[1] high	Repair[2] low	Repair[2] high
Union Pacific RR *Ice Harbor to Lyons Ferry*	$25	$45	$12	$53
Camas Prairie RR *Lyons Ferry to Clarkston*	40	80	24	93
Northern Pacific RR *Ice Harbor to L. Monumental*	5	10	1	6
State & County Roads *various short segments*	2	4	2	10
Whitman Cty. Rd. 9000 *Wawawai to Clarkston*	4	8	3	15
Highway Bridges *various*	4	10	4	10
Railroad Bridges *near Lyons Ferry*	2	5	2	5
Totals	**$82–$162**		**$48–$192**	

*Cost estimates prepared by HDR Engineering, Inc.
[1] to stabilize before drawdown [2] after drawdown



navigable slack water behind dams
Current conditions allow for navigation on flat water with adjacent roadways in stable condition.



free-flowing river during drawdown
Slope instability will likely occur on roads adjacent to former slack water reservoirs.

Corridor Impacts of a Drawdown

Following a drawdown of the four dams on the lower Snake, producers must then choose between shipping via truck or rail. Two scenarios are presented, one in which a combination of trucks and barges would carry the majority of commodities, and one with a significant shift in the movement of commodities to rail.

Highway Scenario

Downstream of the Tri-Cities, commodities will continue to be shipped by barge down the Columbia River to Portland and southwest Washington ports. Upstream of the Tri-Cities, commodities will be moved by truck to the nearest slack water port, which is assumed to be the Port of Pasco. From there, commodities will be transferred onto barges and sent to ocean ports.

Three primary highway corridors and their tributary roadway systems will be affected — US 395 between the Tri-Cities and Ritzville, SR 124/US 12 from the Tri-Cities to Clarkston, and SR 26/Pasco-Kahlotus Highway between Pasco and Colfax. These highways will receive an annual increase in 2.4 million tons of freight, or 169,000 additional one-way truck trips per year.

Infrastructure improvements will be necessary to maintain levels of traffic service, as well as minimize congestion. Improvement projects include intersection and interchange improvements, as well as some localized capacity increases. Additionally, roadway surfaces will require increased maintenance, and more frequent resurfacing.

The total cost impacts of the highway scenario are estimated at $84 million to $101 million, as shown below.

Cost Impacts, Highway Scenario in millions*

Corridor	Infrastructure low	Infrastructure high	Accidents annual incr.
US 395 *(Tri-Cities to Ritzville)*	$20.4	$24.4	$0.5
SR 26/Pasco-Kahlotus Hwy *(Tri-Cities to Colfax)*	18.9	22.7	0.5
SR 124/US 12 *(Tri-Cities to Clarkston)*	31.5	37.8	1.3
Tri-Cities Area	13.3	15.8	0.1
Totals	**$84.1**	**$100.7**	**$2.4**

*Cost estimates prepared by HDR Engineering, Inc.

Rail Scenario

There would be a shift of 2.2 million tons of commodities per year to rail. Existing railroads would not be able to handle all additional traffic, so truck traffic would increase as well, by approximately 1.8 million tons per year.

In some cases, tracks and related facilities that have been abandoned for decades would require substantial investment for rehabilitation. Short line railroads will be most affected.

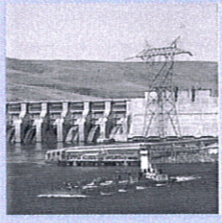
The total estimated cost is $182 million to $214 million.

Cost Impacts, Rail Scenario in millions*

	Improvements low	Improvements high
Blue Mountain RR[1]	$0.4	$0.5
Palouse River RR[2]	17.2	20.7
Camas Prairie RR[3]	2.8	3.4
BNSF/UP Mainline[1]	8.4	10.1
Coulee City Palouse R.[2]	11.0	13.2
Columbia Basin[1]	1.6	1.9
Columbia R. ports[1]	35.0	42.0
New rail cars	50.0	55.0
Related highway improvements	56.0	67.2
Totals	**$182.4**	**$214.0**

[1] includes improvements to elevators & loading facilities
[2] includes improvements to elevators & loading facilities, track upgrades, interchanges, and bridges
[3] includes improvements to elevators & loading facilities and interchanges

*Cost estimates prepared by HDR Engineering, Inc.



Focus on Tri-Cities

Eliminating river navigation above the Tri-Cities would force most commodities that were formerly trucked to an upriver port to be trucked to the next nearest port, presumably one in the Tri-Cities region. From there, commodities would be shipped via barge down the Columbia to ocean ports. For example, Tri-Cities ports would thus be required to handle an additional 100 million bushels of grain annually, which is three to four times the amount of grain now handled there. Impacts include an additional 696 trucks per day on state highways in the Tri-Cities area, much of which will be directed toward ports and off-loading facilities.

Increases in traffic at Richland, Pasco, and Kennewick will be a benefit to the local economy as more goods pass through local ports and transshipment points. New investments in port-related facilities to handle additional traffic would be expected, as well as increases in port-related employment in this area.

However, traffic increases also mean traffic congestion and more accidents. New truck traffic, most of it bound toward local ports, would necessitate improvements to local roads and intersections totalling $13 million to $16 million.

One indirect cost impact of dam drawdowns is a regional shift in earnings and employment. Some port facilities upriver from the Tri-Cities may close. This would mean a loss of port-related jobs, as well as the economic ripple effect of job layoffs. Although the loss to specific areas would likely be offset by an economic gain in the Tri-Cities area, such news may be of small consolation to those in the affected communities but may be short lived if dams are breached on the Columbia.

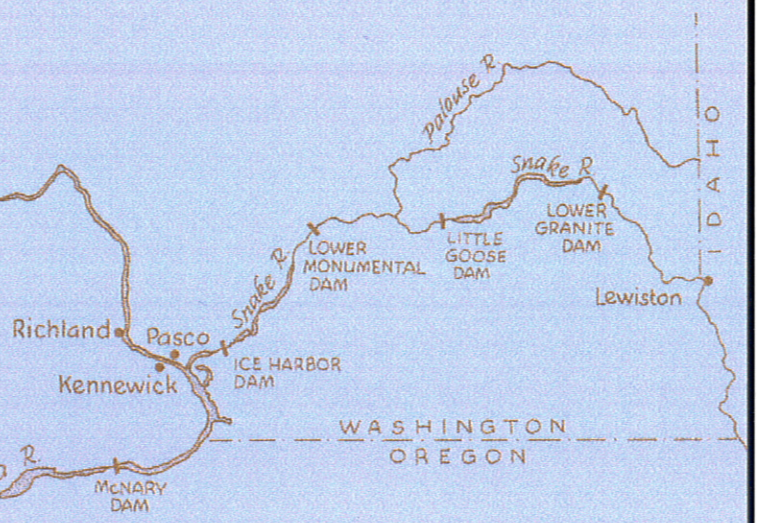
A second indirect impact is the potential loss in value of some agricultural land. Shipping cost increases may cause some producers to go out of business. For others, lower profits due to increases in shipping costs would lead to reduced land values.

On the Horizon

As the Snake empties into the Columbia, the Columbia River is also being studied for possible impacts to endangered fish. Changes to the McNary and John Day dams, the two easternmost of the four dams on the lower Columbia River, would impact future navigation on the Columbia as well as commodity movements.

An initial drawdown study was begun for the John Day Dam in 1998. The study will determine if natural river drawdown of this dam could improve salmon survival rates. A second phase would analyze impacts resulting from a drawdown of the Columbia.

A drawdown study of McNary Dam was recommended by the National Marine Fisheries Service (NMFS) in its 1998 biological opinion. It is likely that the Corps of Engineers will request Congress to authorize such a study in the near future.



Decision Making Process

The Army Corps of Engineers, together with the NMFS, will recommend a preferred alternative in the Final EIS due in late 1999 or early 2000. The Final EIS will then be sent to Congress for action. If the preferred alternative is to breach the dams, Congress must authorize the Army Corps of Engineers to breach the federal dams on the lower Snake, and it must make available necessary funds to accomplish that task.

Timeline

mid to late 1999	Draft EIS on lower Snake River drawdown *by US Army Corps of Engineers, Walla Walla*
late 1999	comment on Draft EIS *by general public, interested parties*
early 2000	Final EIS on Lower Snake River drawdown *by US Army Corps of Engineers, Walla Walla*
2000	Preferred alternative selected, recommended *by National Marine Fisheries Service, Seattle*
	authorization and appropriation to implement *by US Congress*

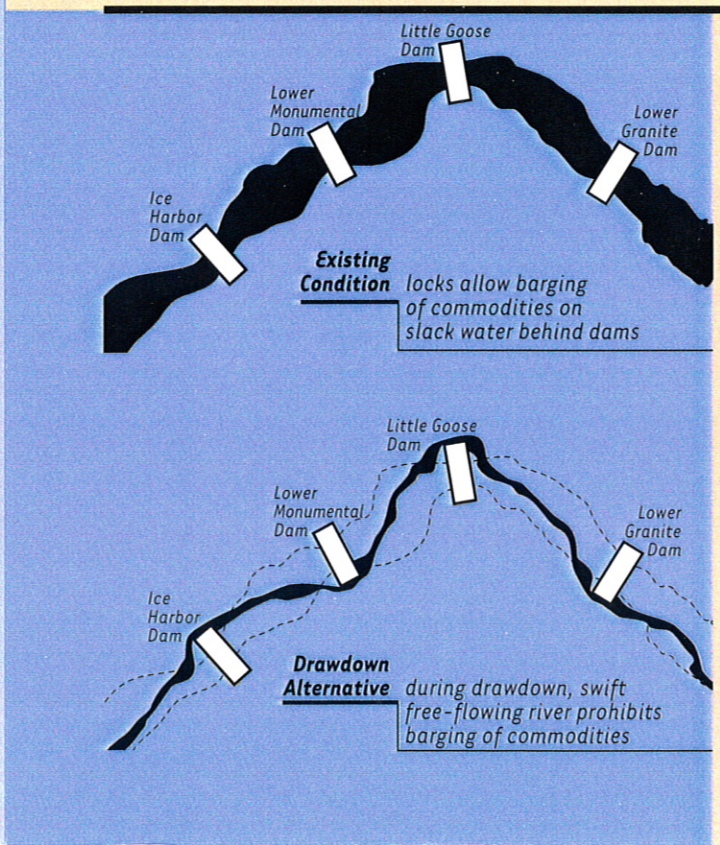
The Snake River & Endangered Species Act

Since 1976, Congress has invested over $200 million in an effort to restore salmon and steelhead trout to the Snake and its tributaries. Yet the numbers of returning fish have continued to dwindle. Biologists estimate that some salmon species are returning to Columbia Basin rivers to spawn at a rate far lower than is needed to ensure the survival of the species.

In 1992, after considering local and state efforts to protect the species from extinction, the U.S. Department of Commerce invoked the Endangered Species Act (ESA) and listed the Snake River sockeye salmon as endangered. Invocation of the ESA requires federal agencies with jurisdiction to determine "reasonable and prudent alternatives" to be taken in order to ensure that the species are not further jeopardized by federal action.

U.S. Army Corps of Engineers, Walla Walla District, built and maintains the four dams on the lower Snake River, and is preparing the Environmental Impact Statement (EIS) on the proposed alternatives, which is due in mid to late 1999. The study focuses on how the lower Snake River dams can be changed to improve survival and recovery prospects for salmon.

National Marine Fisheries Service (NMFS) is responsible for the final administrative agency decision on lower Snake River dam drawdowns. Its 1995 biological opinion directed the Army Corps of Engineers to prepare the feasibility study currently underway. This agency's decision on the preferred alternative will be forwarded to Congress for action.



Alternatives Under Study

These alternatives will be studied in full and results will be released in the Army's Draft EIS. The public and other interested parties will have time to comment on the Draft EIS, and a Final EIS will be issued in early 2000. The Final EIS will likely recommend a "preferred" alternative.

1. Maintain the existing system of fish transport

Some juvenile salmon, or smolts, are currently trucked or barged from slack water to free-flowing water, speeding their journey downstream. The Army Corps also augments river flow and increases spill measures to assist fish migration.

2. Major system improvements

Migrating fish must either pass through turbines, through fish bypass systems, or over dam spillways. Many fish become disoriented in slow-moving slack water pools, are killed by gas emissions from spillways, or die from the force of the dams' turbines while attempting to swim through them. Improvements proposed include construction of collection systems that divert fish away from the dams' turbines; fish guidance improvements; turbine modifications; structural changes to reduce gas levels; and operational changes such as modifying river flows and spills.

3. Natural drawdown of the river

The four dams on the lower Snake River would be breached; that is, the earthen embankments in the vicinity of the dams would be partially demolished or otherwise removed in order to allow the river to flow freely around and through the dams. Removal or demolition of the concrete dam structures is not envisioned under this scenario. Dam drawdowns will return the existing system of slack water reservoirs to a more free-flowing state, resulting in a river that flows faster, yet deeper and narrower, than it does currently. Such a free-flowing waterway, a condition that was in place prior to 1962, is not suitable for barge traffic. Breaching of the dams would thus end commercial navigation and hydropower production on the lower Snake River.

These illustrative maps show one possible drawdown scenario and are not intended to represent any proposed drawdown scenario. They are not drawn to scale.

Washington State Legislature

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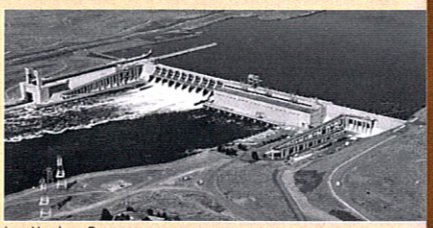
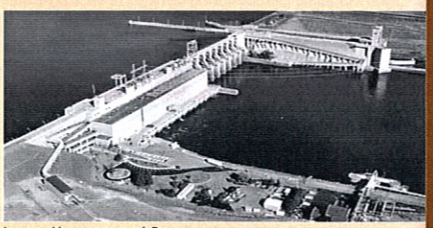
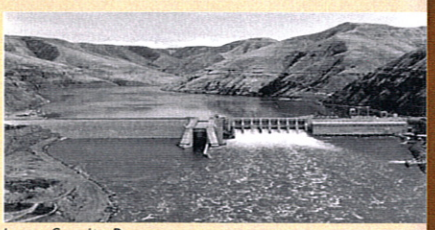


Ice Harbor Dam USACE



Lower Monumental Dam USACE

Little Goose Dam USACE



Lower Granite Dam USACE

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