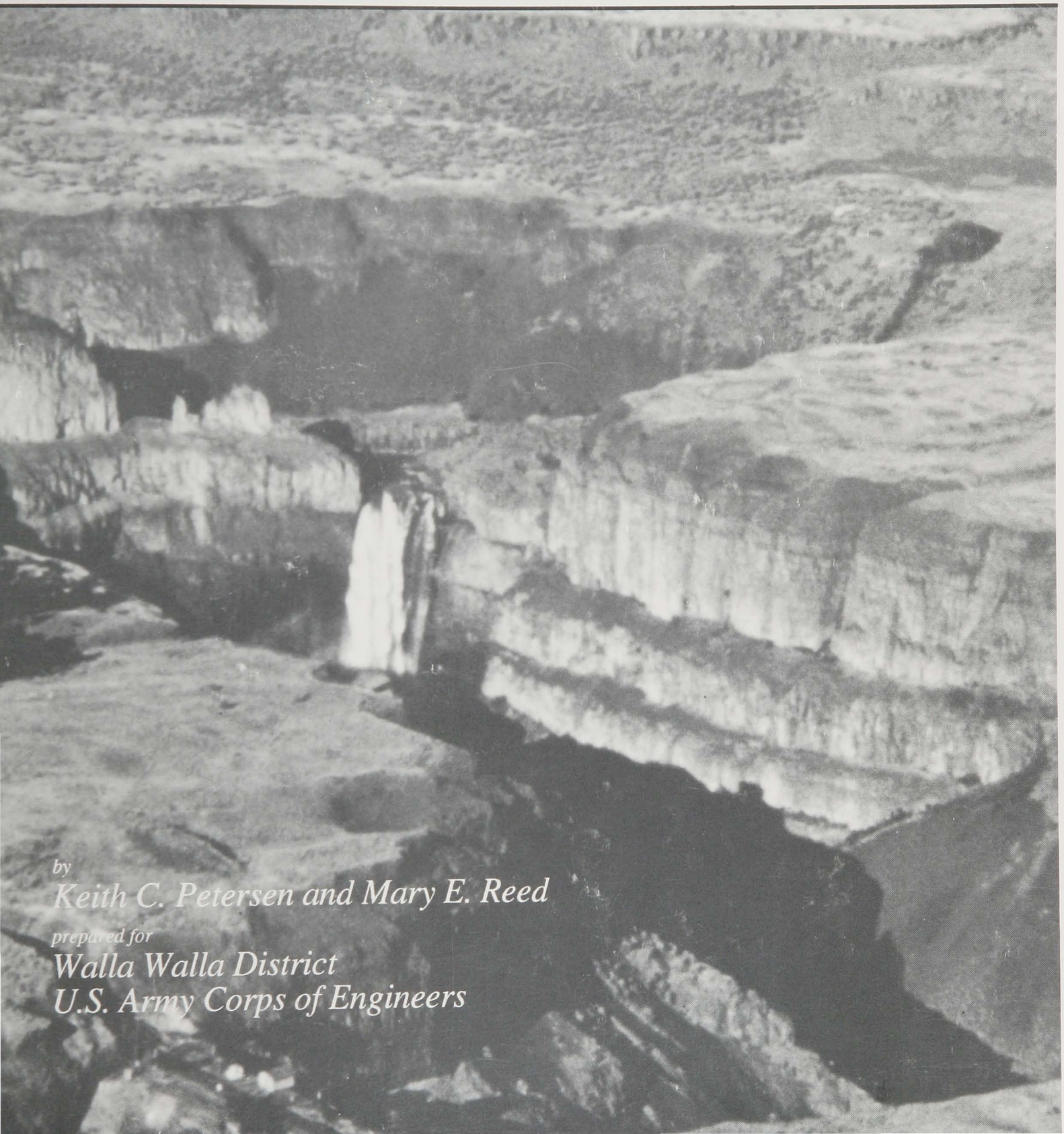
Controversy, Conflict and Compromise: A History of the Lower Snake River Development



by
Keith C. Petersen and Mary E. Reed

prepared for
Walla Walla District
U.S. Army Corps of Engineers

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
1994		**00-00-1994 to 00-00-1994**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Controversy, Conflict and Compromise: A History of the Lower Snake River Development	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **US. Army Corps of Engineers,Walla Walla District,201 North Third Avenue,Walla Walla,WA,99362-1876**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**257**	

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Contents

Acknowledgments

Names on a book's cover invariably reflect only a small part of the team required to complete the manuscript. Many people were on our team.

John Leier, Walla Walla District archaeologist, served as our contracting representative and provided helpful editorial assistance. Before John's appointment, James Hackett and Carol Wolff of the Public Affairs Office served as contracting representatives and assisted us on research trips to the District office.

William Willingham, North Pacific Division historian, offered insightful comments on various manuscript drafts. Several people at Walla Walla--both current District employees and retirees--reviewed all or part of the manuscript. We especially acknowledge the help of John Leier; Chuck Wolfkiel, resource management officer; Michael Taylor, chief of the Office Operations Branch; Joseph McMichael, project manager of the Lower Snake River Fish and Wildlife Compensation Plan; John McKern, biologist in the Operations Division; and Bertram Hoare, Harry Drake, Willard Sivley, and Edwin Franzen, all retired chiefs of the District's Engineering Division.

Several people allowed us to interview them. The final manuscript is better because of them. Patrick Seward, University of Idaho geologist, who gave us a fascinating tour of the channeled scablands and lower Snake region; Richard Daugherty, one of the Northwest's preeminent archaeologists; Robert Lee Sappington of the University of Idaho's Laboratory of Anthropology; Ray Oligher, retired Walla Walla District biologist; Pullman historian Glen Lindeman, who knows the history of Western exploration as well as anyone; Jack Thompson and Jim Weddell of the Port of Whitman County; Eldon Crisp, Superintendant of the Port of Wilma; Steve Pettit, fish passage specialist with the Idaho Department of Fish and Game; Rex Baxter, biologist at Little Goose Dam; Bill Knox, biologist with the Oregon Department of Fish and Game; Scott Sutliff, chief of the Maintenance Section at Ice Harbor Dam, who gave us an adrenaline-flowing tour "behind" and "below" the scenes there; Ed Ferrell, maintenance worker at Lower Granite Dam; and Cory Egan, Snake River tugboat pilot, who let us share a fine day and evening on the river on the Juvenile Fish Transportation Program barge; Bill Carter, resource maintenance foreman for the Corps' lower Snake wildlife habitat units; and Fred Miklancic, chief of the District's Geotechnical Branch.

Many archivists and librarians helped us during the project, expecially Rose Marie Moore at the Walla Walla District Library; Martin Gordon at the Corps' Office of History in Fort Belvoir, Virginia; Lawrence Dodd, archivist at Whitman College's Penrose Memorial Library, Walla Walla; Patricia Hopkins and David Hastings at the Washington State Archives and Records Center in Olympia; M. Gary Bettis and Elizabeth Jacox at the Idaho State Historical Society in Boise; Joyce Justice and Scott Roley at the National Archives--Pacific Northwest Region, Seattle; Karyl Winn, Janet Ness, and Jo Lewis at the Archives and Manuscript Section of the University of Washington Library, Seattle; Richard Hobbs and Emma Meissner at Eastern Washington University Library in Cheney; and Alan Virta, Archivist at Boise State University Library.

The *Lewiston Morning Tribune* and Idaho State University published portions of this manuscript while we worked on the project; Diane Pettit and Stephen Lyons provided editorial help. They helped us think of ways to write a complicated story so readers might understand.

Our friend and colleague, Craig Holstine of Archaeological and Historical Services at Eastern Washington University, Cheney, assisted us in finding helpful research materials in the collections there.

Alice Gronsk, curator of the Museum of Anthropology, Washington State University, and Carol Lichtenberg of the Holland Library, Washington State University also assisted.

The U.S. Geological Survey Library in Denver, Colorado was helpful in researching materials.

We have no doubt left out the names of many deserving recognition, and for that we apologize. We hope they know that we thank them as indispensable parts of our "team."

Authors

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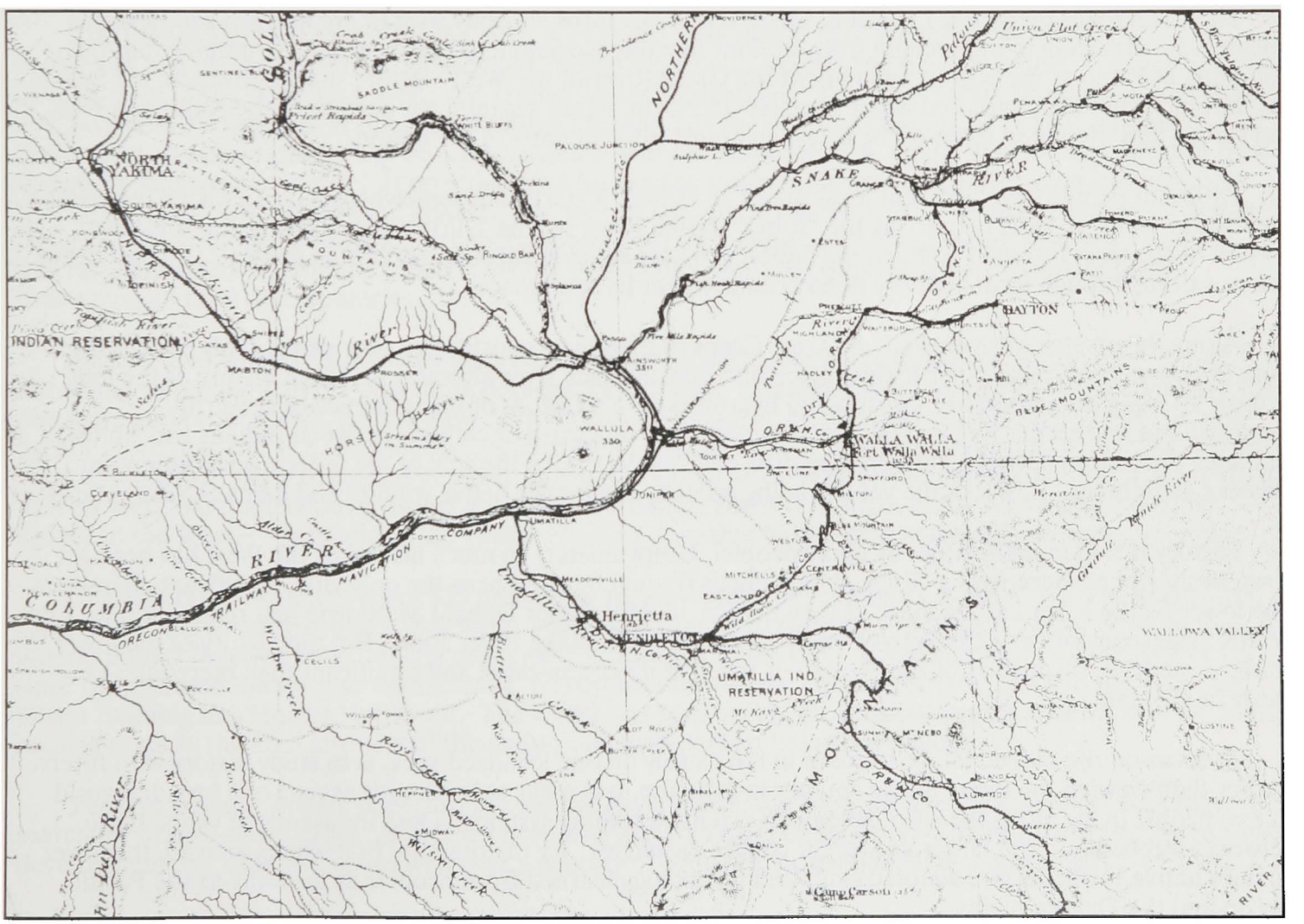
Introduction

Rivers slice through time and place. The Snake River has carved deep canyons into the landscape while it has cut through more than 10,000 years of human history. During that time it has provided many of life's essentials for those living near it: food, water, protection, transportation, and power. Studying a river like the Snake reveals much about people and place and changing times. As historian Donald Worster has said, "To write history without putting any water in it is to leave out a large part of the story. Human experience has not been so dry as that." [1]



Map of lower Snake River region, prepared by the Engineer Office, Department of the Columbia, 1881.

In western Wyoming, high mountain peaks shed water into creeks with names like Fox, Wolverine, Rodent, Crooked, Sickle, and Basin. Their union produces the Snake River.

The Snake flows west to the Lewis, then turns south into the Jackson Hole country. Paralleling the Teton Range, it gains additional energy from the Gros Ventre and Hoback rivers before entering Idaho.

Moving west, in the days before dams and irrigation diversions, it dropped precipitously in a series of spectacular waterfalls, some of which lent their names to cities: Idaho Falls, American Falls, Twin Falls, taller–than–Niagara/Shoshone Falls, Augure Falls, and Salmon Falls, all the time gathering force from the accumulated waters of the Blackfoot, Portneuf, Raft, Big and Little Wood, and Bruneau rivers.

Reaching Idaho's western border, it juts briefly into Oregon, then turns abruptly north, forming the boundary between those two states, taking on the waters of the Owyhee, Malheur, Burnt, Powder, Boise, Payette, and Weiser rivers. Flowing now with the force of one of the world's great streams, the Snake hurtles through Hells Canyon, the deepest and narrowest gorge in North America. The Salmon and the Grande Ronde enter, and the river becomes the boundary between Idaho and Washington.

The Clearwater merges at Lewiston, where the Snake turns abruptly west to arc through southeastern Washington, amassing more strength from streams like the Tucannon and Palouse before merging into the Columbia at Pasco as the biggest tributary of the Great River of the West. Before that confluence, the Snake has flowed 1,036 miles, gathered water from six states, cut across a significant portion of the American West, and served as a lifeline to some of the driest and most isolated parts of the nation.

Different people have different ideas about just where it starts, but somewhere near Lewiston, where the Clearwater feeds in, most people say the "lower" Snake River begins. During its last 140 miles, this lower portion of the river transects some of the nation's richest agricultural country, cutting gorges 2,000 feet deep, before exiting through fertile but dry desert country near its confluence.

Along this stretch of river the U.S. Army Corps of Engineers constructed four dams. This book is the story of how people came to settle this region and demand such river alterations. It is a history of the long struggle to bring navigation to Lewiston and hydropower to a region; of the influence of powerful congressional representatives and booster organizations; of a clash of cultures between Indians and whites and later contention between environmentalists and developers; of the role of the federal government in Western settlement. It is, too, the yet unfolding account of whether native wildlife and dams can long coexist.

History is told in many ways, by many people. Unfortunately so much history of the West has been set down in shorthand stereotypes. Rugged individuals frequently emerge as the only vital, significant characters. The lower Snake River had its share of such people, like fur trader Donald McKenzie and riverboat pilot Len White, stagecoach driver Felix Warren and bachelor recluse Snake River John. But the history of the lower Snake––indeed, the history of the West––is much more complicated and significant than mere tales of hardy individuals.

To focus on the individual, or to zoom in too closely on one localized area, is to study history with filters. Rather than viewing the lower Snake country in isolation, it is wiser to think of it as part of a broader world. Native people living along the river developed extensive trading systems. Over thousands of years, these networks webbed out into larger and larger concentric circles. By the time the first whites arrived, the lower Snake's native residents had adapted skills and technology learned from peoples as far away as the Pacific Ocean and the Dakota plains.

Those first white visitors came bent on staking a nationalistic claim to the land, sent by a visionary President ruling an embryonic country from a capital nearly 3,000 miles away. The next excursioners came searching for furs, goods that could enrich company coffers when sold in the eastern United States and Europe. Gold seekers came, found color in the Clearwater and Salmon country tributary to the Snake, and, like the fur traders, shipped their resource out. Cattlemen came, fattened stock, then drove their herds far to the east for transport to market. Farmers came and planted wheat, and that wheat sailed halfway around the world, first in Europe, and more recently in Asia. Finally, dams came and provided vast amounts of hydropower, far more than lower Snake residents could use; and this product too, arteried out in a maze of electric lines, serving the needs of people living between the borders of Mexico and Canada.

Like much of the West, the lower Snake River country, sparsely populated but productive, has always been a land of export. Today, two of its most important exports are wheat and hydroelectricity. Were it not for outside demands for these products, the lower Snake would today be undammed. The Corps' huge monoliths bisect the river not so much to serve people living near the dams as to meet the needs of others residing far away. The lower Snake country has always depended on the outside world. We cannot understand this region's local history without taking into account the influence and intricacies of national and international markets and politics.

The role of the state in settling the West is even less understood than the influence of international economics and national politics. To spotlight rugged individuals negates the most important component in the development of the American West: the United States government. The government provided homesteads and gave land for schools. It offered incentives for railroads to crisscross the region. It gave money to researchers to assist farmers and brought irrigation water to those farmers' lands. It offered protection from threats by humans and nature. It provided land for grazing stock, timber to feed mills, electricity to power factories, contracts to employ the masses. Yet, we can read library shelves full of Western literature, stories of farmers and ranchers, cowboys and trappers, towns and cities, clubs and organizations, and never find the federal government mentioned. That is history in a vacuum, for it ignores the most prominent thread connecting all their diverse stories.

It is not that writers have totally ignored the federal government's role in the American West. Some fine historians, particularly in the past three decades, have written excellent pieces about this subject. But popular literature and history have, for the most part, bypassed this story. Perhaps writers have ignored no federal agency more than the U.S. Army Corps of Engineers. The Bureau of Reclamation and its role in watering the West has had the luxury of good syntheses. [2] But the Corps, with its influence centered more on navigation, hydropower, and flood control, awaits such skilled analysis. Yet, it is difficult to think of a single federal agency in the West--particularly the Pacific Northwest--that has more dramatically affected the region.

The federal government spent $33 million on Western water development in 1939. Just ten years later, it expended seven times that much, and water budgets continued to rise. By the 1940s, one out of every four federal dollars invested in waterways development flowed into the state of Washington. Nothing before or since transformed the state so dramatically. Historians now call the period from the 1930s to the 1970s the "Dam Building Era" in the Northwest. The Corps was responsible for constructing most of the federal dams, helping to mold the area into one of the nation's most important industrial regions. [3]

Perhaps popular writers disregard the federal government and agencies like the Corps because they search for drama and conflict. If so, they have overlooked a compelling story. The history of the lower Snake development, for example, spans well over a century of controversy, conflict, and compromise.

"The history of the West," Worster wrote in 1985, "has tended to remain, against all evidence to the contrary, what it was in Thoreau's time: a saga of individual enterprise. . . . It is time that [the] emergent technological West, the West of the hydraulic society . . . be put beside the storybook West of fur trappers, cowboys, sodbusters, and intrepid adventurers." [4]

In fact, the real history of the West is not so much the story of the individual as it is the story of the government: government power, government money, government expertise, government technology, government bureaucracy. Some vigorous individuals traveled along and lived beside the lower Snake River. But it was the government, through the Corps of Engineers, that altered the stream. And the historical implications of that action far outweigh all the individualistic acts of all the rugged people who ever set foot on the river's banks.

This is the story of how that river was developed and some of the consequences of that action, consequences that will affect the lives of many generations of Westerners to come.

Endnotes

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[1] Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Pantheon Books, 1985), p. 19.

[2] See especially Worster, *Rivers of Empire*; Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water* (New York: Penguin Books, 1986); and Richard Lowitt, *The New Deal and the West* (Bloomington: Indiana University Press, 1984).

[3] The statistics come from Worster, *Rivers of Empire*, pp. 266, 269.

[4] Worster, *Rivers of Empire*, p. 11.

Palouse Falls is one of the most dramatic pieces of geological evidence for the Missoula Floods.

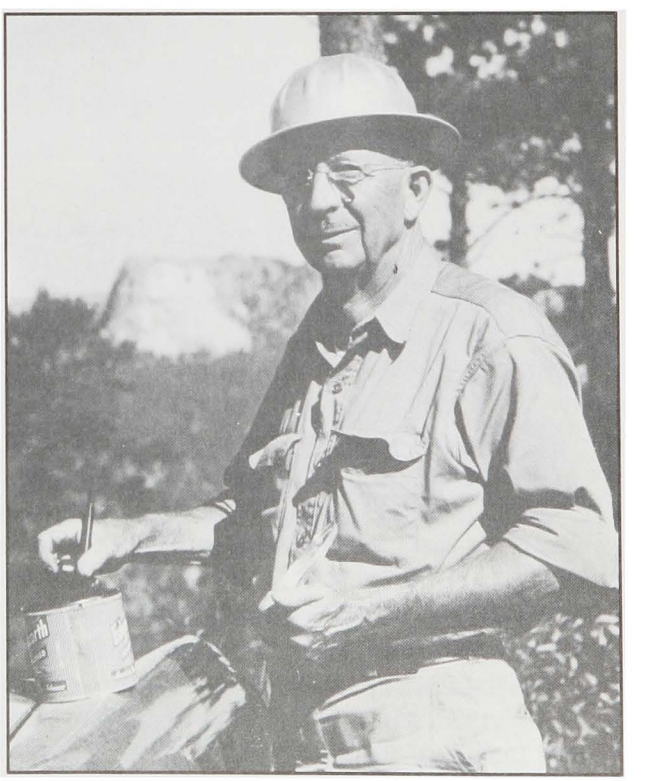
Chapter 1
Fire and Water

In the 1920s, geologist J. Harlen Bretz, working in eastern Washington, uncovered evidence of the world's largest prehistoric floods. He discovered gravel deposits as big as hills, waterfalls and canyons formed in a day or two by torrents, and thousands of acres scoured clean of topsoil by rushing waters.

Other geologists had observed the region Bretz named the Channeled Scablands and speculated about its origins. They concluded that slow geological change, glacial runoff flowing gently over thousands of years, created this landscape. But Bretz brought a new theory to the study. In a series of controversial publications stretching over five decades, he hypothesized that huge floods shaped the country.

According to Bretz, an ice dam in the Bitterroot Mountains created Lake Missoula, backing thousands of square miles of water into Montana during the last Ice Age, 12 to 15,000 years ago. Eventually, the lake topped and broke through the plug, releasing tons of water. Once the lake had drained, ice dams reformed, creating other giant lakes that eventually breached the dams in a downstream rush. Over and over the floods poured out, destroying everything in their paths.

The giant floods took three routes before converging into the Columbia River. The easternmost one Bretz called the Palouse–Cheney tract. Following this course, water rushed into the lower Snake River before plunging into the Columbia.



J. Harlen Bretz

Palouse Falls, a few miles upstream from the confluence of the Palouse and Snake rivers, is 185 feet high, one of the most dramatic pieces of evidence for these floods. There were no falls before the floods. Indeed, no river or canyon existed here. The land's formation began when continental plates collided, buckling the basalt underlying this area. This bending motion weakened the rock. When the flood waters rushed through, tons of water cracked the basalt, eroding part of the land, forming Palouse Falls and the canyon below.

As the flood roared out of the Palouse canyon into the Snake, they struck a high basalt knob on the opposite shore of the bigger river and split in two directions, some going downstream and some up. A portion of the water rushed up the Snake about 80 miles to present-day Lewiston, burying Lewiston/Clarkston Valley under approximately 600 feet of water. The Snake, seventh largest river in the United States, reached this point flowing at full power. It was no easy task to force such a river to reverse its flow. This was perhaps the only example of this phenomenon occurring on a river if this size anywhere in the world.

Evidence of the floods seems obvious to geologists now. But in the 1920s, J. Harlen Bretz endured the ridicule of his colleagues for proposing such a theory. A modest flow of water over millions of years could create a Grand Canyon. But a deluge in a few days could not create a Palouse Canyon. Nature did not work that way. Or so geologists thought until Bretz came along. [1]

Bretz was 96 years old when the Geological Society of America awarded him its highest honor in 1979. The award came from a new generation who had learned to see the world as Bretz did. His contemporaries had been less approving. To understand why, we would have to go back several centuries. [2]

In 1788, James Hutton wrote *Theory of the Earth*, a radical departure from the day's standard thinking. Most Westerners of the 18th century believed the earth had formed in the Biblical time frame of 6,000 years. But according to Hutton one could not explain the earth's geology by thinking of catastrophic events packed into a few thousand years. Rather, a slow process taking millions of years created landscapes. Mountain peaks rose slowly and eroded slowly; it took eons to shape river canyons.

Hutton's theory left room for natural catastrophes: volcanos, earthquakes, and floods could transform landscapes. Indeed, along the Snake River geologists had long accepted the idea that the catastrophic Bonneville Flood, the second largest ever documented in the world behind only Missoula, had dramatically altered the river's canyon.

G.K. Gilbert uncovered evidence of the great Bonneville Flood as early as 1878, and geologists accepted the notion of tremendous torrents of water rushing from Utah's Lake Bonneville, overflowing Red Rock Pass, and cascading down the Snake somewhere between 15,000 and 30,000 years ago. Flood waters reached a depth of 300 feet, eroded channels, created cataracts, scabbed land, and deposited bars of huge boulders and gravel, the same characteristics Bretz noted about the Missoula floods. Most of the Bonneville Flood's impact can be seen along the upper Snake because the Missoula floods covered all evidence of Bonneville along the lower river. But geologists know that the Bonneville Flood had enough energy to deposit large gravel mounds as far downstream as Lewiston before exiting out the lower Snake into the Columbia.

Hutton's theory could accommodate a Bonneville Flood, impressive though it was. Bonneville had a flow of 12 to 16 million cubic feet per second. It was catastrophic, but geologists with imagination could contemplate that much water. The Missoula floods were of a totally different scale. Missoula waters flowed at 380 million cubic feet per second, 25 to 30 times greater than Bonneville's, an amount of water difficult to envision. [3]

Although most people came to accept Hutton's ideas by the 20th century, it had been difficult to wean the Western world from its Biblical time frame and to convince people to think in terms of millions and billions of years rather than thousands. Geologists were reluctant to condone a theory that once again explained the origins of the earth by the abandoned views of rapid, catastrophic change. Consequently, many protested loudly when Bretz proposed that a Genesis–like flood had created a vast landscape in eastern Washington.

Bretz, however, remained undeterred by his numerous critics. He did his field work, hot summer after hot summer in the 1920s, walking, riding horseback, or driving an old Dodge across the scablands. "With eyes only a few feet above the ground the observer today must travel back and forth repeatedly and must record his observations mentally, photographically, by sketch and by map before he can form anything approaching a complete picture," Bretz wrote in 1928. It was this type of painstaking field work for which he became famous.

Channeled Scablands of eastern Washington.

Gradual geological change could not explain what Bretz observed on those summer excursions. He was convinced that only a catastrophic flood could move boulders and create gravel bars and cataracts of the size he discovered. So he published his ideas, and his fellow scientists condemned each in turn as "inadequate," "preposterous," and "incompetent." Eventually, through persistence and convincing arguments, Bretz won the day. In the 1950s aerial photography showed the evidence of floods that had been difficult to detect from ground level. [4]

Today, no geologist doubts that the floods occurred. They debate the number of floods and spend time refining Bretz's theory. But they agree the floods helped to shape dramatically the landscape of the lower Snake River country.

The Missoula floods were perhaps the most dramatic event in the geologic history of the region. But the floods occurred only a few thousand years ago, and to understand how land formed around the Snake River a we must go back farther than 12,000 years. [5]

The Precambrian Era covers 85 percent of the earth's 4.6 billion years. But this is a shadowy time to geologists studying the Snake. Most of the landscape lies hidden under tons of earth detritus deposited later. The story of this land becomes clearer as geologists research more recent periods.

During the Paleozoic Era, 600 to 225 million years ago, much of the land around what is now the Snake River was covered by ocean waters inhabited by unfathomable numbers of sea creatures. Their shells now form limestone deposits hundreds of feet deep. The earth's inner heat broke through its crust during the Paleozoic Era, Idaho's Seven Devils volcanos rose, and some of Idaho ascended above the ocean. On this land forests grew, and creatures left the water to find food and shelter. By 375 million years ago, insects roamed over these forests unmolested by birds and other animals, which had not yet appeared. Then the forests died and became coal and peat.

In the Mesozoic Era, 225 to 65 million years ago, dinosaurs ruled the Snake River region. Tyrannosaurus rex, 25 feet tall, the largest carnivore that ever moved on land, roamed the valleys and hills. Pterodactyls glided overhead. Once again heat rose from the earth's core, and from southwest Idaho all the way into Canada old surface rock melted and became granite, the deep rock of the Idaho batholith that shapes the state's mountains. Ore deposits formed at this time. Gold, silver, lead, and zinc deposited in cracks of the batholith created some of the world's richest mineral veins. As the temperature cooled, forests of cedar, sequoia, pine, and juniper replaced the palm trees now buried and turning to coal. The first birds and mammals came to the Snake River region, eating insects, plants, and fruits.

The modern era, the Cenozoic, arrived about 65 million years ago, ushered in by cold that dropped temperatures several degrees. Huge reptiles died, but some insects, birds, mammals, and small reptiles evolved and survived. The land then warmed again, and for a time these creatures lived in forests much like those found in the southeast United States today, forests of persimmon, hickory, and hazel. Then the Cascade Mountains folded out in gigantic wrinkles to the west, forming a rain barrier that created a drier and cooler climate on the Snake River plateau. For a time in the Cenozoic Era, horses the size of dogs, camels the size of rabbits, and rhinos the size of sheep roaming the Snake River plains were gradually replaced by a tremendous variety of animals, including squirrels, beavers, bears, elephants, and monkeys.

The Cenozoic was also the time of great lava eruptions in the lower Snake River region, flows that, more than any other geologic event, gave the land its shape. It could have been the greatest outpouring of lava in geological history.

Beginning about 17 million years ago and continuing for some 10 million years, molten lava oozed from cracks in the earth's surface and poured over 60,000 square miles. The earth's crust cracked down to the basaltic mantle that lies as a shell encircling the world, and lava belched out in flow after flow. It left behind what geologists today call the Columbia River basalts. Time after time the earth spewed basalt, each time laying down layers of lava 50 to 100 feet thick. Scientists have detected over 50 of these eruptions along the Snake, and there might have been more than 200, enough lava to bury all of New England in a one–half–mile deep ocean of molten rock. In some places along the lower Snake the accumulated basalt, cooled and hardened into blocks and columns, is nearly 2.5 miles deep.

The lava vented from several places, but Moscow, Idaho, just north of the Snake, was a primary source. The lava flowed west, burning everything in its way, filling valleys and inundating uplands. Here and there peaks of an old mountain range composed of Precambrian rocks uplifted during the late Mesozoic or early Cenozoic Era, proved too tall for the lava to cover. One such peak now is known as Steptoe Butte, in Whitman County, Washington; and geologists worldwide today use the term "steptoe" to describe an island of older rock surrounded by lava.

The basalt did not flow smoothly. It created mounds, valleys, and flats, giving regions adjacent to the Snake their distinctive shapes. The lava also disrupted the flow of the lower Snake, filling canyons and forcing the river to meander into its present course. Some geologists actually believe that this was not Snake River water being channeled, but rather the flows of the Clearwater and Salmon rivers. The Snake, they say, drained through Oregon not Washington. The river gradually changed course to merge with the Clearwater and Salmon, flowing down the canyon they had cut. Because the Missoula floods ripped so much of the geologic record from the canyon, the history of the Snake and its course remains an enigma.

Steptoe Butte

After the lava stopped flowing, the area of the lower Snake again cooled. The Ice Ages commenced about 2 to 3 million years ago. The ice gathered and then melted several times, covering all of Canada and much of northern United States, then melting, then advancing again. Each advance lasted thousands of years, with long, warm, dry periods in between. The last glacial period, the Wisconsin Ice Age, most dramatically affected the Pacific Northwest.

This advance began about 70,000 years ago and consisted of several periods of glacial growth and retreat. The last one occurred between 15,000 and 12,000 thousand years ago, the time of the latest and largest Missoula floods.

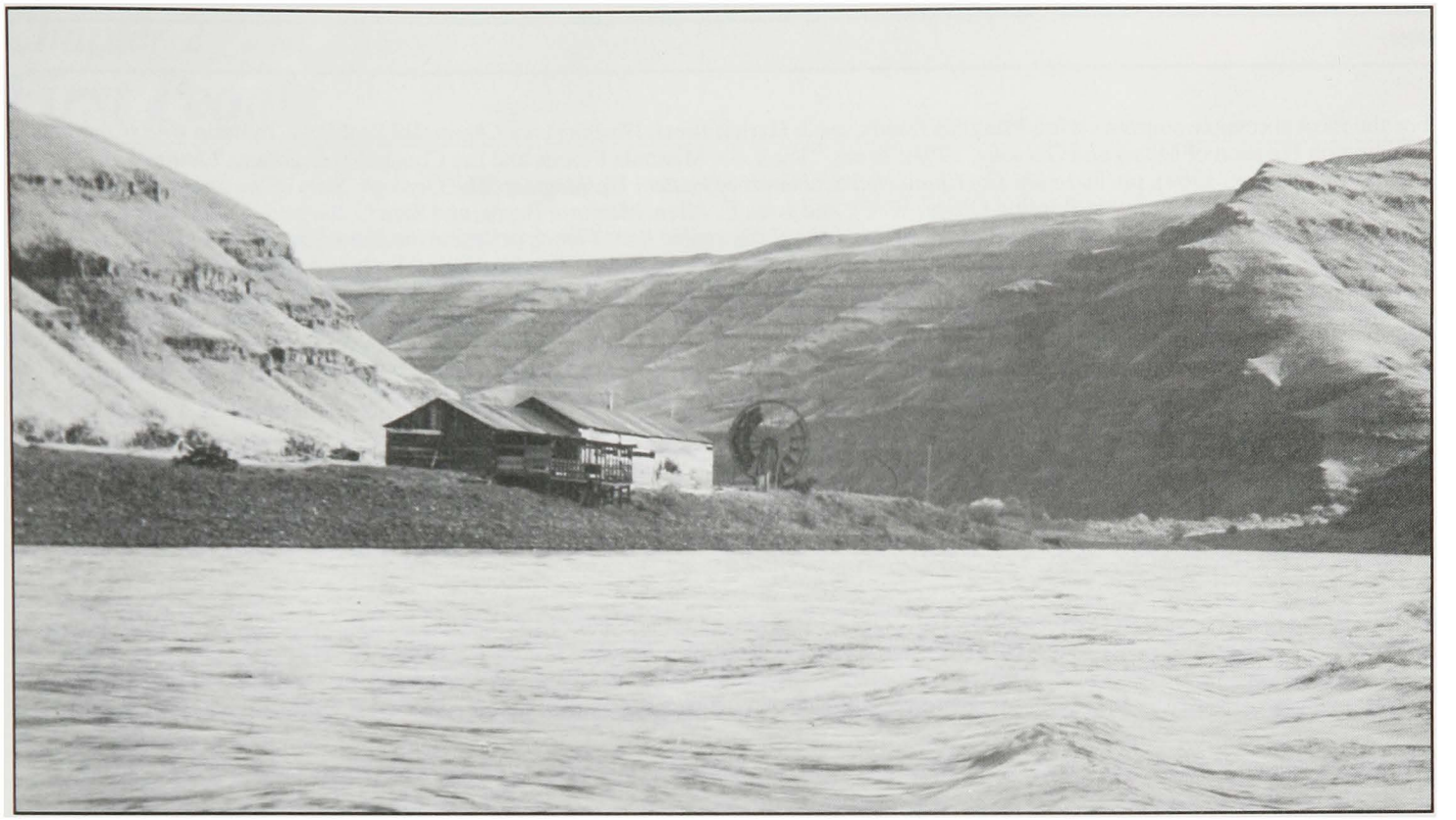
Wisconsin-age glaciers did not creep all the way to the Snake, but they got within 80 miles. During this glacial period the Snake country cooled again, appearing much like Alaskan tundra. In fact, archeologists found the remains of an arctic fox at the Marmes Rockshelter near the confluence of the Palouse and Snake rivers. Mammoths, sometimes 14 feet tall, were the largest creatures inhabiting the country. Bison with horn spreads of six feet also roamed the region, as did giant sloths and saber-toothed tigers. Man appeared in time to hunt the last of the mammoth and bison. He chased them into narrow canyons and bogs, killing them with razor-sharp spears.

The giant fields of ice ground rock into a rich soil--a sort of glacial flour--and winds blew it down over the hills the Columbia River basalts had created. Thousands of years of wind gently reformed it into soft sculpted dunes. Geologists call this wind-deposited silt loess. It forms a rolling landscape of incredibly fertile topsoil over 200 feet deep in places, some of the richest land on earth. On that land farmers would eventually plant wheat, peas, and lentils and seek ways to ship their products to market. They would look to the nearby Snake River for their access to the outside world.

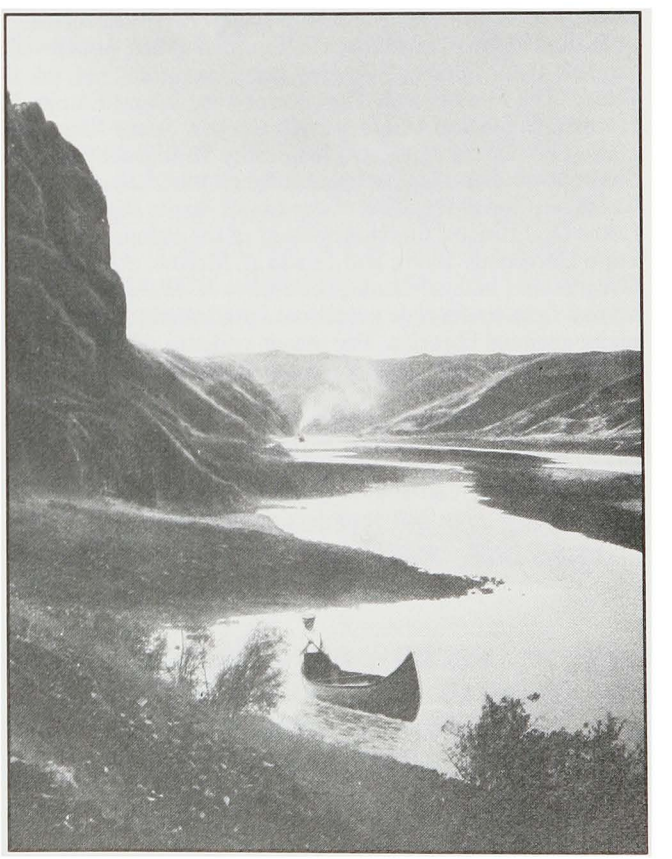
Indeed, the geology of the region set the foundation for its history. The Snake connected with the Columbia and formed a network to the sea. Young salmon and steelhead followed this waterway, migrating to the ocean and returning as adults on their way to spawn. The earliest residents found shelter in caves formed from various lava flows and set up homes in the warm Snake River canyon. They hunted on the hills surrounding the river and fished for salmon and steelhead.

Later, settlers of a different culture came to the region. They extracted minerals in nearby hills and established a raucous tent city at a place called Lewiston. Merchants supplied the city and mines with goods that sternwheelers brought up the Snake River. Still later settlers built frame houses on low benches along the river and grew fruit on rich soil the stream deposited. On plateaus above the river, farmers cultivated the loess-covered hills, and ranchers grazed sheep and cattle in the Channeled Scablands. Towns grew up to serve the farmers and ranchers. And the Snake River became a vital lifeline for these farms and towns, a means to send crops downstream and bring supplies up. The river also eventually became a place to recreate and a source of power to light barns, houses, schools, and businesses.

This human history is layered over the land just as basalt is layered over Precambrian rocks and loess is layered over basalt. It reveals itself in chapter after chapter of human use and alteration of the river. That part of the story begins with the first people to see the Snake River.



above and at right: Lower Snake River scenes



[1] For the most accessible sources on the Missoula floods, see J. Harlen Bretz, *Washington's Channeled Scabland*, Bulletin #45 (Olympia: Washington Division of Mines and Geology, 1959); Bretz, "The Lake Missoula Floods and the Channeled Scabland," *Journal of Geology*, 77:5 (Sept. 1969), pp. 505–43; *The Channeled Scablands of Eastern Washington: The Geologic Story of the Spokane Flood* (Washington, D.C.: Government Printing Office, 1976); and John E. Allen, Marjorie Burns, and Sam C. Sargent, *Cataclysms on the Columbia: A Layman's Guide to the Features Produced by the Catastrophic Bretz Floods in the Pacific Northwest* (Portland, OR.: Timber Press, 1986). Other useful sources, more technical in tone, include Bretz, "The Channeled Scablands of the Columbia Plateau," *Journal of Geology*, 31:8 (Nov./Dec. 1923), pp. 617–49; "Glacial Lake Missoula . . . ," *Guidebook for Field Conference E* (International Association for Quaternary Research, 7th Congress), pp. 68–89; Bruce D. Cochran and John H. Bush, "A Channeled Scabland Field Trip, Eastern Washington," in Patricia Beaver, ed., *Tobacco Root Geological Society 11th Annual Field Conference* (Spokane: Tobacco Root Geological Society, 1986), pp. 52–65; and Donal R. Mullineaux, et. al., "Age of the Last Major Scabland Flood of the Columbia Plateau in Eastern Washington," *Quaternary Research*, 10:2 (1978), pp. 171–80.

[2] The following discussion of the Bretz controversy comes from Allen, *Cataclysms on the Columbia*; Bretz, "Alternative Hypotheses for Channeled Scabland," *Journal of Geology*, 36:3 (Apr./May 1928), pp. 193–223; 36:4 (May/June 1928), pp. 312–41; and Stephen Jay Gould, *The Panda's Thumb: More Reflections on Natural History* (New York: W.W. Norton & Co., 1980), pp. 194–203. For a brief biographical sketch of Bretz, see *American Men of Science: A Biographical Directory; The Physical and Biological Sciences*, 11th ed. (New York: R.R. Bowker Co., 1965).

[3] For background on the Bonneville Flood see G.K. Gilbert, "The Ancient Outlet of Great Salt Lake," *The American Journal of Science and Arts*, 15:3 (Apr. 1878), pp. 356–9; Harold E. Malde, *The Catastrophic Late Pleistocene Bonneville Flood in the Snake River Plain, Idaho,* Professional paper #596 (Washington, D.C.: Geological Survey, 1968); and Eric Craig Swanson, "Bonneville Flood Deposits Along the Snake River Near Lewiston, Idaho" (unpublished masters thesis, Washington State University, 1984).

[4] For the importance of aerial photography in redeeming Bretz, see Bretz, "Lake Missoula Floods and Channeled Scablands," p. 508.

[5] While information on the Missoula floods is accessible to lay audiences, an easily understood description of Snake River geology remains to be written. The best overview for nonspecialists is Eugene H. Walker, "The Geologic History of the Snake River Country of Idaho," *Idaho Yesterdays*, 7:2 (Summer 1968), pp. 18–32. For Columbia River basalts see Newell P. Campbell, *Geology of the Yakima Area* (Yakima, WA.: self published, 1981; rev. ed. 1984). Also useful for understanding the geology of the region are: John C. Reed, "The Fiery Floods That Formed the Inland Empire," *Natural History*, 47 (April 1941), pp. 200–10; T.L. Vallier and P.R. Hooper, *Geological Guide to Hells Canyon, Snake River* (Pullman: Washington State University Department of Geology, 1976); Hallett H. Hammatt, "Late Quaternary Stratigraphy and Archaeological Chronology in the Lower Granite Reservoir Area, Lower Snake River, Washington" (unpublished Ph.D. dissertation, Washington State University, 1977); Mark Thomas Wheeler, "Late Cenozoic Gravel Deposits of the Lower Snake River, Washington" (unpublished Masters thesis, Washington State University, 1980); Louis Don Ringe, "Geomorphology of the Palouse Hills, Southeastern Washington" (unpublished Ph.D. dissertation, Washington State University, 1968); and Edwin H. McKee, et. al., "Duration and Volume of Columbia River Basalt Volcanism, Washington, Oregon, and Idaho," *Geological Society of America Abstracts with Programs*, 9:4 (February 1977), pp. 463–4. Also very useful are the several field conference guidebooks published for annual conferences of Spokane's Tobacco Root Geological Society, available in most major regional libraries. For recent evidence of the size of the Columbia River basalt flows––now considered by some to be the largest in the world––see *Spokane Spokesman–Review*, 12 Dec. 1990.

Chapter 2
First People

For 500 years people have debated how long humans have lived in North America. The controversy goes back to the 15th century when Christopher Columbus thought he had discovered a New World, only to find others already living there. This initiated continuing speculation into how and when Columbus' Indians had arrived.

At first, Europeans believed unknown pilots, perhaps Carthaginians, had sailed the Atlantic and settled America. Next came the idea that the ancient continent of Atlantis had once connected Spain to the Americas. When it sank, so people theorized, it stranded early colonizers in the New World. Then came a persistent belief that American Indians were part of the exiled Ten Lost Tribes of the Hebrews who had spread over the world, somehow making their way to the western hemisphere.

As early as 1589, a Jesuit missionary named Jose de Acosta wrote a remarkable book. Nearly 150 years before Vitus Bering sailed through the strait named for him and while Siberia was still a blank spot on world maps, de Acosta suggested that Indians had not arrived by sea, nor crossed the Atlantic. Rather, "savage hunters driven from their homelands by starvation or some other hardship" took an overland route through Asia to America.

In 1856 Samuel Haven wrote *The Archaeology of the United States*, the most influential tract published on American archaeology to that time. Like de Acosta, he stated that the first Americans came from Asia and had crossed the Bering Strait. Many still questioned the hypothesis, but by mid–19th century, people increasingly believed Indians arrived first on the western coast of the Americas, not the eastern. [1]

Most people at first thought these ancient settlers arrived by boat across the narrow Bering Strait. Gradually, however, de Acosta's concept of people walking from the old world to the new gained adherents. If people walked, they needed something to walk on, and that something was Beringia, a piece of land at times 1,000 miles wide, connecting Siberia and Alaska. It is more popularly known as the Bering Land Bridge, though it really did not resemble a bridge. It was broad country with rolling hills, indistinct from the Siberian and Alaskan lands it connected. People traveling along this route would not have known they were crossing from one continent to another.

Beringia lay exposed because glaciers trapped so much water that sea levels lowered. Less than three percent of the earth's water is salt free, and most of that is locked in glaciers. Today's ice sheets hold so much water that, should they melt, oceans would rise 300 feet, covering places like Los Angeles and New York. Yet today's glaciers trap only a fraction of the water they held in the ice ages. During the last ice age, glaciers retained so much water that ocean levels shrank more than 200 feet below today's shore lines. And Beringia appeared.

Between 10,000 to 25,000 years ago, people could have walked from the old world to the new. At earlier times, during earlier ice ages, the land bridge also appeared. It was during one of these periods that tribes of hunters first followed herds of mammoth and other large game into Alaska. As glaciers melted, Beringia disappeared, cutting off the wanderers. These people multiplied, eventually populating two continents.

Some archaeologists believe the settling of the Americas began early. Louis Leakey, famed hominid hunter of Africa, once claimed a site in California showed evidence of human occupation over 200,000 years old. That would mean humans considerably unlike us had crossed the Arctic land bridge, a hypothesis most think unlikely since people of this period were probably incapable of adapting to harsh northern climates. Other archaeologists think they have found evidence of human occupation of North and South America more than 40,000 years old, but the record is sketchy.

By 35,000 years ago, modern homo sapiens evolved, and about 10,000 years after that Beringia was exposed for its latest run as a land bridge. Most investigators agree it was during this time that the first person stepped onto Alaska and discovered a new world. Speculation runs high as to just when that momentous event occurred. But archaeological records indicate the presence of people in the new world by 13,000 years ago, and possibly before that. [2]

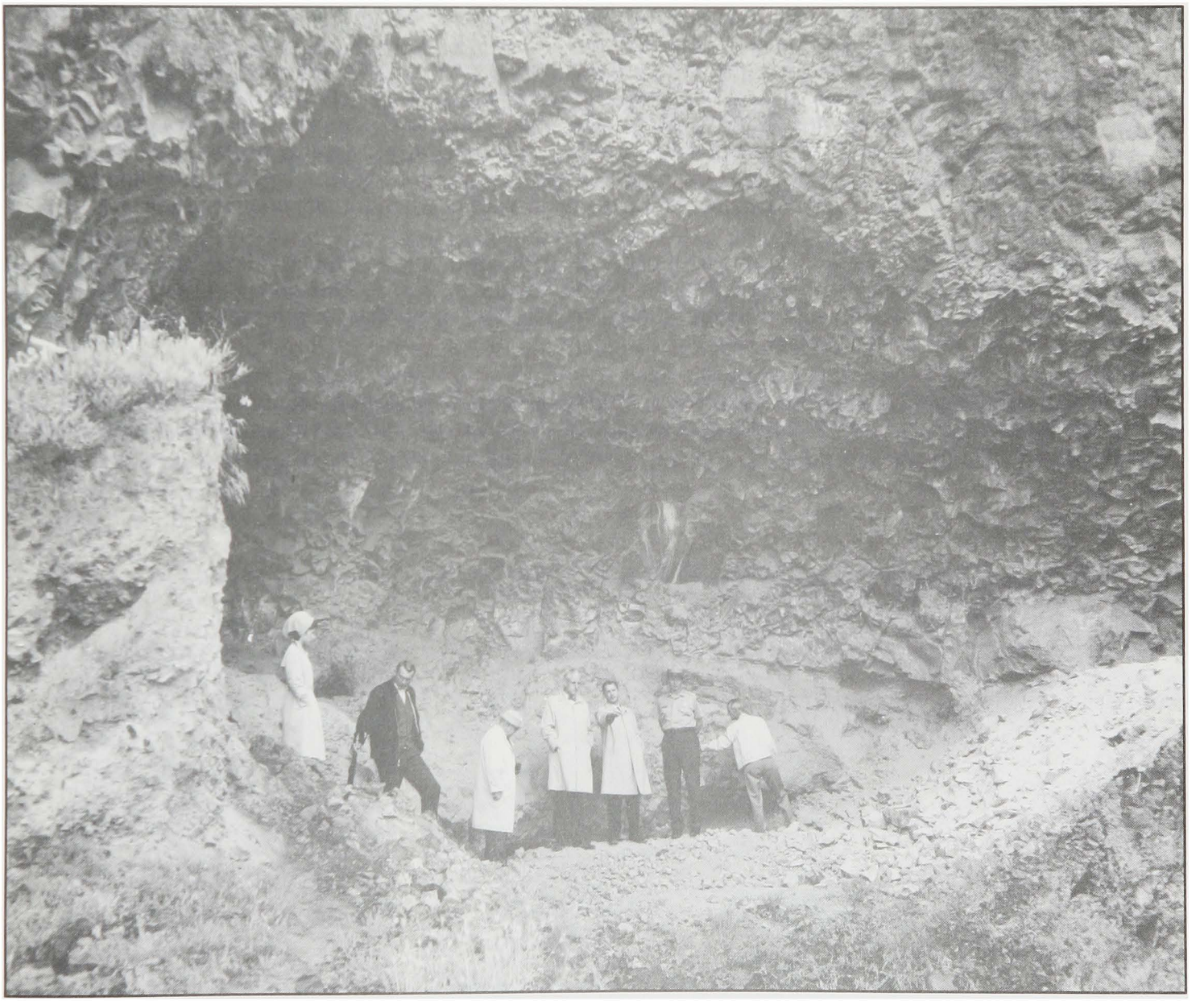
Beringia was broadest precisely when North American ice was thickest. Gigantic glaciers, the Laurentide in the east and the Cordilleran in the west, covered Canada with hundreds of feet of ice, blocking the southern migration of Beringia's wanderers. However, interior portions of Alaska, a zone archaeologists call the Alaskan Refuge, remained ice free, and here the Asian nomads lived and hunted.

Their population grew, testing the refuge's ability to provide sustenance. While the number of residents increased, the great ice sheets receded, raising sea levels and inundating Beringia. With no possibility of return to Asia, these early Americans, searching for food, found an ice–free corridor between the Laurentide and Cordilleran glaciers, a narrow, rugged passage through Canada. It was an uninviting journey across rocky barriers and raging rivers through an inhospitable land. But the wanderers made it, and eventually some bands arrived at the southern Canadian border, looked out upon the plains abutting the Rocky Mountains, and proceeded on. In a remarkably short period of time, perhaps a little over 1,000 years, they settled places as distant as the Great Lakes and California, Mexico and Peru, Florida and Argentina. It was one of the greatest accomplishments in human history. [3]

This is the generally accepted theory, although some archaeologists have different ideas about how and when people migrated south. But if these first Americans entered the United States through Canada's ice–free corridor, they had to arrive on either the east or west side of the Rocky Mountains. Archaeologists debate this point, too. Perhaps groups came to both sides almost simultaneously. But it is possible that the first person to see the United States crossed the Canadian border somewhere between eastern Washington and western Montana, just north of the Snake River. From that point other bands followed, chasing herds moving east, west, and south. It is possible that some of these first Americans lived along the lower Snake River, a warm place with ample shelter and food. The Missoula floods tore away any evidence of settlement prior to the last flood about 12,000 years ago. But people definitely inhabited the lower Snake after the flood, leaving behind evidence of the way they lived. [4]

In the summer of 1965 Roald Fryxell, a geologist with Washington State University's Laboratory of Anthropology, uncovered evidence of one of the earliest known homes in North America.

In 1953, local residents had first shown Washington State University's Richard Daugherty what came to be known as the Marmes Rockshelter. In 1962, Daugherty, one of the Northwest's leading archeologists, began excavating the site. Daugherty and colleagues, including Fryxell, worked the rockshelter intermittently for three summers, finding dozens of artifacts and the remains of several humans. It was a valuable site, but this was a hectic time for Washington State archeologists. The U.S. Army Corps of Engineers had completed Ice Harbor Dam in 1962. They would soon finish Lower Monumental and move on with plans for two additional dams upstream. Daugherty knew of dozens of lower Snake River prehistoric sites that deserved attention before backwater flooded them. He had small crews, little money, and less time. But Fryxell was intrigued by the potential to uncover a long geological record in the soft silt in front of the Marmes Rockshelter. He would have to fit Marmes into his busy schedule, but he would give it what time he had.



Entrance to Marmes Rockshelter.

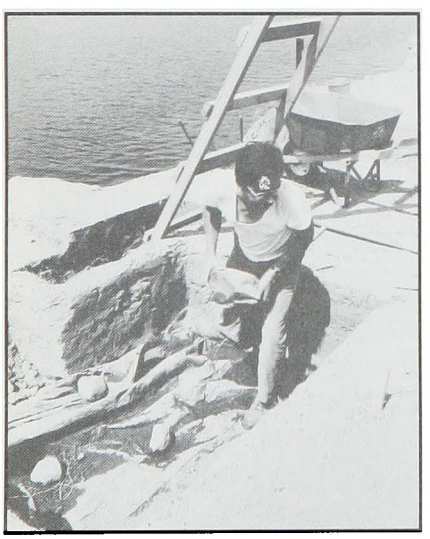
Walking behind a bulldozer driven by Roland Marmes, the property's owner, Fryxell in 1965 discovered bone fragments several feet below the ash line Mt. Mazama's eruption created about 6,700 years ago. These were obviously ancient bones. Washington State University scientists later proved they were human, between 9,000 and 11,000 years old.

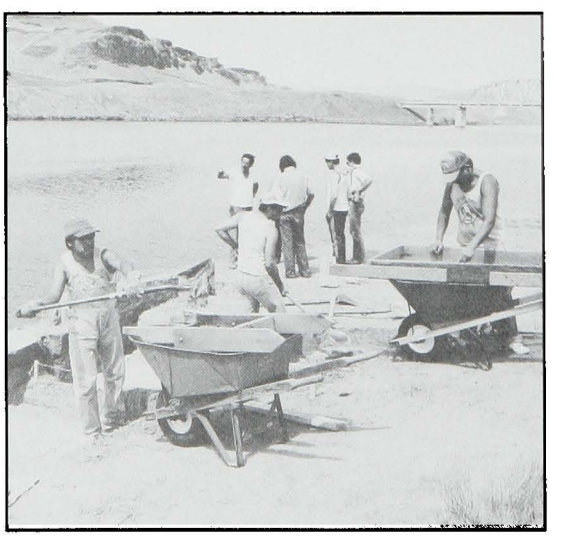
Fryxell's discovery amazed the archaeological world. These were the oldest well–documented human remains ever found in North America. Not only were the bones old, but they were also in an unusual location. Overlying the ancient remains rested layer upon layer of evidence of human use of the rockshelter, extending into the 20th century when white residents occasionally explored the cave. Here existed 10,000 years of human history, condensed into one small area, waiting to be uncovered. It represented a find of extraordinary significance. As Dr. H. Marie Wormington, president of the Society of American Archaeologists, said, "The odds against finding such a complete package of evidence within one site again are so great it is almost impossible." [5]

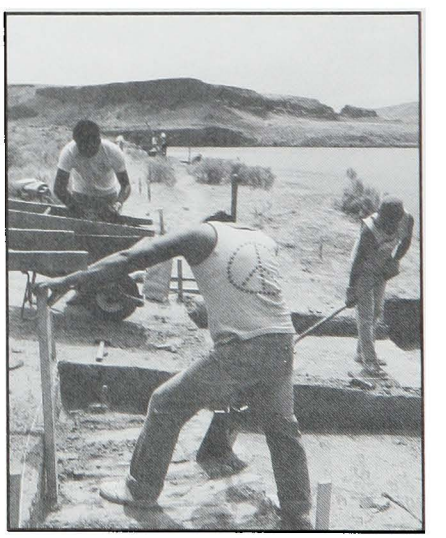
Daugherty and Fryxell decided to concentrate on Marmes as the most significant lower Snake site facing immediate inundation. Once they did, they quickly uncovered more riches. They found a tiny, perfectly preserved sewing needle. They located weapons, hundreds of artifacts, and the bones of animals; and they could tell what these people ate and how they lived. And they uncovered more ancient human remains. Each week they found more precious evidence of early life in the Americas. They worked frantically but were running out of time. The Army Corps of Engineers' Lower Monumental Dam would soon flood the site.

The archaeologists established a tent city and hired a bigger crew. They designed a field laboratory in a trailer and often worked from 6 am to 12 am, digging, sifting, cataloging. By August 1968 they had removed 5,000 cubic yards of dirt, much of it with trowels, brushes, and dental picks. Yet, they were still discovering rich cultural material. They needed more time.

In midsummer Daugherty and Fryxell requested the Walla Walla District of the Corps of Engineers to build a protective dike around the Marmes site. The District, however, did not have the authority or money for such construction. [6]







above, left to right: Archeological work at the confluence of the Tucannon and Snake Rivers.

Daugherty then asked his friend Senator Warren Magnuson for help. Magnuson sought congressional approval of $1.5 million to build a levee, but the House of Representatives killed his proposal. Undeterred, he took his case directly to President Lyndon Johnson. No American president had ever ordered funding to preserve an archaeological site. Weeks passed. Late October arrived with no presidential decision. The Corps urged Magnuson to withdraw his request, but the senator refused. The engineers tried to persuade the President not to authorize levee construction. But on the last day of October, Lyndon Johnson ordered the Corps to build a protective dike around the Marmes archaeological site. The Walla Walla District would design it, and the Seattle District would supervise its construction. [7]

The Corps attempted to intercede with Magnuson and Johnson because it was in a difficult situation. Engineers with the agency had reservations about the levee's ability to keep the Marmes site dry. The Corps was also concerned about fish. Beginning with the construction of the first federal dams along the Columbia in the 1930s, fishery agencies worried that the obstructions would harm salmon and steelhead runs. The Corps worked with the agencies to develop ways to pass fish over the blockages. Fish biologists knew the date the Corps placed Lower Monumental Dam in operation would be critical for salmon and steelhead. If the Corps filled the reservoir too late in the spring, it could jeopardize an entire year's fish migration. After meeting with fishery agencies, the Corps agreed to begin filling the reservoir by December 1968, to allow time to test fish passage equipment before the annual spring fish runs. But Lyndon Johnson's last minute authorization to construct the protective levee threw this schedule out of kilter, and fishery agencies protested.

There is a "potential fish passage crisis at Lower Monumental Dam," the Oregon State Game Commission wired Senator Mark Hatfield. "While we are in sympathy with archaeological investigations . . . we have no alternative but to oppose this particular project as serious fish passage problems would very likely result," wrote the Idaho Fish and Game Department to Senator Frank Church. [8]

But the Corps had its orders. It was to construct a levee and complete it by the end of February 1969, allowing time to test fish equipment before the spring run. There was never any doubt that the dike would hold, but water backed up by the dam could seep into the levee and fill it from behind. The Corps recognized the problem and proposed to pump the seepage back into the river. But the engineers underestimated the amount of water that would come. [9]

Marmes Rock Shelter underwater behind levy, February 1970.

In February, the Corps began filling the Lower Monumental reservoir. Water gushed inside the Marmes levee at a rate of 45,000 gallons per minute as gigantic pumps tried unsuccessfully to keep it out.

The Corps opened Monumental's flood gates to lower the reservoir and give workers a chance to find the problem. The engineers discovered the leak and knew how to fix it. But to secure the dike would take time, and the Corps did not have time if it was to save migrating salmon and steelhead.

Years after these events, Harry Drake, then chief of Walla Walla's Engineering Division, reminisced on the Marmes episode:

> *When Lyndon Johnson stepped in and said, 'Build it,' I met the Chief of Engineers in a motel room in Lewiston and he said, 'Have at it, boys, and don't worry about the cost.' I thought, 'No sweat.' We'd built these cofferdams all up the river and had good success. We might not have caught just how serious the deep leak was even if we had more time. As it was we only had days to plan. Even if we had known about the deep leak we didn't have time to do anything about it. We could not go deep enough. There wasn't a damn thing we could do. We had to close Lower Monumental that year or risk the structure and the fish run.* [10]

With the reservoir lowered, the Corps worked hurriedly with Fryxell and his team to protect the Marmes site. Crews covered the ground with giant sheets of plastic and dumped truck loads of fill over the top of them to prevent water from sloshing through and destroying the fragile stratigraphic record of events. Finally, the Corps ordered the site evacuated. As engineers removed their pumps, archaeologists watched as 40 feet of water covered one of North America's most valuable prehistoric sites. For a while the Corps contemplated "dewatering" Marmes, claiming all they needed was authorization and money. But the authorization never came.

Many newspapers throughout the Northwest blamed the engineers for the flooding. But in reality, Marmes was lost by an unfortunate series of events: If only archaeologists had begun excavating earlier. If only Congress had authorized money to construct the dike in the summer of 1968, allowing ample time to plan and build a suitable breakwater. If only Congress had provided funding to dewater the site once it flooded. If only fisheries people had not put so much pressure on the Corps. If only these circumstances had changed, archaeologists might know much more about the early people who came to settle the lower Snake River after the last Missoula flood. [11]

But they know quite a bit, thanks to archaeological work undertaken at prehistoric locations all along the river. Damming the Snake flooded archaeological sites, but it also enabled archaeologists to learn a great deal about America's prehistory. The National Park Service and the Corps spent millions of dollars on archaeological investigations there, a salvage operation yielding some of the most significant information ever uncovered about early life in the West.

Marmes was the most publicized of the lower Snake archaeological digs, and many people maintain that it was the most significant. But there were dozens of others--Strawberry Island, Alpowa, Davis Bar, Windust Caves, Thorn Thicket, Wawawai, Squirt Cave, Granite Point, Three Springs Bar. Materials uncovered at these places have enabled archaeologists to piece together the story of early people along the lower Snake River.

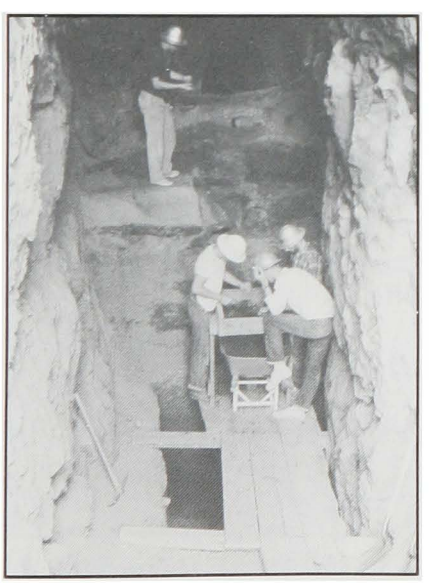
Archaeologists divide life along the lower Snake River into five phases. The earliest, dating from about 10,000 to 8,000 years ago, is the Windust. The Cascade phase runs from about 8,000 to 4,500 years ago and the Tucannon from 4,500 to 2,500 years ago. The Harder phase takes life up to about A.D. 1750 and the Numipu postdates 1750. Demarcations between phases blur: there was no sudden, drastic change from one lifestyle to another. But, by establishing these time periods, archaeologists have developed a scheme of how people lived along the river for more than 10,000 years. [12]

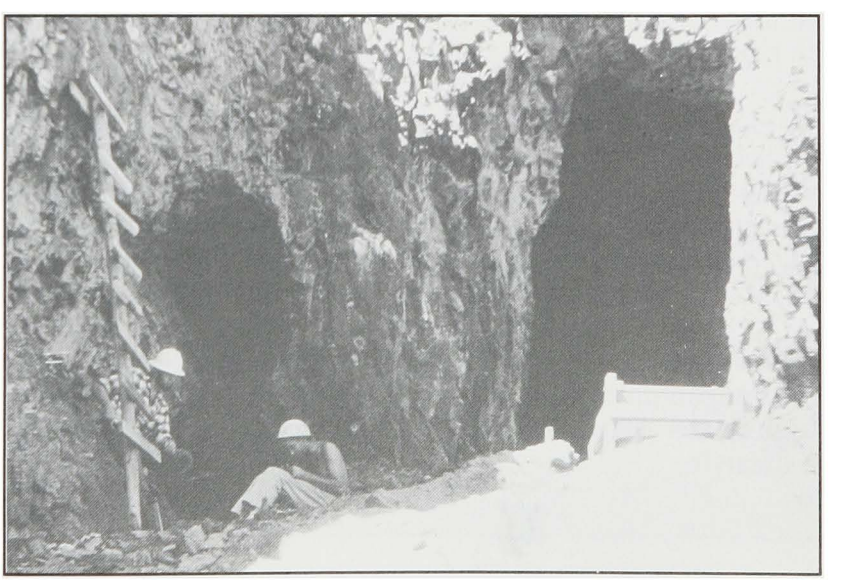
The lower Snake canyon today is inhospitable. In places, the scabbed basalt drops precipitously to the river, gravel tailings sliding down cliff faces. In other spots gentler slopes meet the water. Sparsely covered with desert grasses and sage, these provide entry to the prairies above.

This land looked different 8 to 10 thousand years ago. In those days this was a cool country. Fryxell's team found the jawbone of an arctic fox inside the Marmes Rockshelter. Flood plain vegetation more resembled a tundra than today's desert. There were probably some wooded patches nearby on protected north slopes and along river banks, for archaeologists also found the remains of red fox and pine marten, animals of the forest.

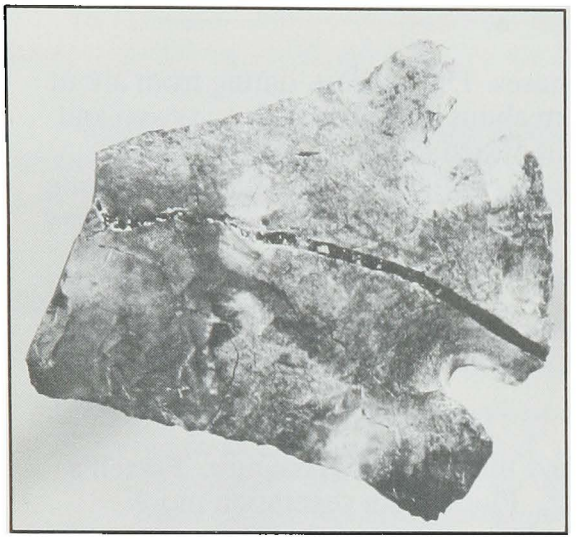
Downstream from Marmes, archaeologists excavated a series of nine rockshelters known as Windust Caves. They also worked upstream at Granite Point. At these and other lower Snake locations they found tantalizing evidence of the way people lived more than 8,000 years ago.

Life had rhythms during this Windust phase, dictated by the need to survive. During early spring people fished and gathered roots on flat land near the river and the plains above. Later they picked berries on wooded hillsides. Then came summer hunting on the uplands: summer when hides are at their best rather than autumn when animals rut. Fall found people back at the river catching fish. Mobile during much of the year, the river people concentrated in winter along the warm stream banks in and around rockshelters. Not all activity stopped. They probably harvested river mussels during cold months when water was low, and they certainly hunted any big game that wandered to the river banks. But winter was generally a time of resting for the upcoming food–gathering seasons.

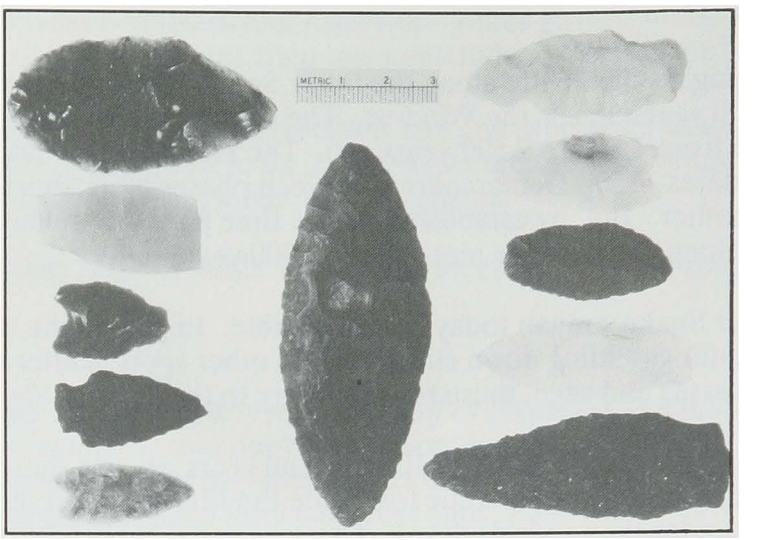




above, left and right: Archeological work at the Windust Caves site.



Native American scraping tool.



Native American tools.

These people are sometimes stereotyped as big–game hunters. Those along the lower Snake did stalk big animals. They made razor–sharp spears and hunted deer, antelope, and elk. Hunters drove the animals past companions lying in ambush who threw spears with atlatls, devices that extended a spear–thrower's arm, enabling him to hurl projectiles twice as far and with greater force. These settlers might also have trapped big game in man–made pits camouflaged in animal trails. They ate meat fresh or prepared it for winter storage, fashioned hides into clothes and shelter, and cracked animal bones to expose nutritious marrow.

But the ancient people of the Snake did not live on big game alone. They supplemented their diets with a complex diversity of food. They caught small game such as rabbits, marmots, and fox, probably trapping them. They fished trout, sturgeon, salmon, steelhead, and suckers; gathered seeds, roots, and berries.

These ancient river residents carved finely crafted, intricate bone needles as small as modern embroidery needles. They stitched skin clothing and sewed waterproof bags to transport drinking and cooking water from the river. They split large crushing, chopping, and scraping tools from basalt slabs, and fabricated delicate blades from crystalline rocks, blades many times sharper than modern surgical scalpels. They developed a trade network with neighboring peoples and treasured the tiny seashells they bartered for, seashells from an ocean 400 miles away.

Small groups of people, perhaps two or three families, lived in the Marmes Rockshelter, at Windust Caves, and in other ancient sites along the lower Snake. These people probably had more leisure time than later agricultural societies. They did not have the intensive work of sowing and harvesting, or tending to herds and flocks; and during leisure time they developed rituals and refined religion. The residents of Marmes, for example, cremated their dead, perhaps as a way of preparing them for their next life.

This was life during the Windust phase, which merged into the Cascade. Most changes between the two––different notching in projectile points and slightly varied stone tools––are too subtle for nonspecialists to appreciate. But some developments, particularly in fishing methods, portended a more substantial shift in lifestyle.

Archaeologists do not know exactly when salmon began migrating along the Snake. The catastrophic Missoula floods would have destroyed spawning grounds; and if fish ran up the Snake before the floods, it would have taken some time for them to reestablish their migratory patterns. At least by 9,000 years ago, during the Windust period, anadromous fish made their way upstream. But, during the Cascade phase, 8,000 to 4,500 years ago, fishing techniques grew more sophisticated. River residents at this time clearly knew how to harvest large quantities of fish. The salmon became to the people of the Snake what buffalo was for those on the Plains: a source of abundant, reliable food. Snake River residents balanced their diets with other foods, but rich salmon runs gave predictability. These people developed intricate rituals to help insure bountiful supplies.

The semisubterranean pithouse was the other major innovation of the Cascade period. The architecture became more sophisticated in later times, but by the end of this era or the beginning of the Tucannon, people were increasingly building their own houses rather than relying on natural rockshelters and caves. This allowed greater flexibility in determining suitable living places. People of the Cascade period also buried their dead, sometimes ceremonially placing seashells with the bodies and covering graves with piles of stone.

Archeological work at Snake River pit house in summer of 1957.

Archaeologists detect a shift to the modern era in the Tucannon phase, 4,500 to 2,500 years ago. Projectile point notching changed again and fishing equipment became more refined. Archaeologists have found numerous fishing sinkers from this era, as well as shuttles for weaving nets. Grinding materials--mortars and pestles--are more prevalent. Perhaps these people relied less on big game and more on grains and roots. Scientists speculate that a population increase could have required more intensive scouring of all available resources, while a climate change might have increased some food sources while decreasing others.

Perhaps the most significant modification was the gradual replacement of the atlatl with bows and arrows. The change was slow. People used both weapons simultaneously and only gradually placed confidence in the bow. When they did begin using bows, they had a much more efficient hunting machine. Along with a lightweight bow, stalkers could carry multiple arrows, all easily and quickly made. Arrows traveled farther than spears, and hunters could fire them from hidden, crouched positions rather than standing.

The Harder period, from about 2,500 years ago to A.D. 1750, found the region's people clustered into villages of pithouses rather than living in isolated family units. The term pithouse is unfortunate, implying humans living in grubby holes. That was not the case. The architecture was ingenious. Pits dug as much as five feet in the ground, but usually shallower along the warm Snake River, provided winter warmth and summer coolness. Builders covered a conical pole framework with mats, then banked them with an insulating layer of dirt. People could easily stand upright inside. A central hearth provided heat, with smoke ventilating out the top of the cone. In winter the mats dampened, swelled, and froze, closing out cold weather. Residents often stacked multiple layers of mats around pole frameworks for additional protection. In spring and summer they would remove the outer layers. The single mat layer remaining then dried and shrank, providing ventilation.

Their pithouses were often large. One oval-shaped home at Alpowa was nearly 30 feet long. Residents divided interiors into various activity centers: a place for cooking, for preparing hides, for making baskets. These people made intricate waterproof baskets, filled them with water, and then dropped heated rocks in them to cook food. Their villages were permanent, with the same locations often occupied for hundreds of years. People relied on pithouses more in cold weather than warm. In spring, summer, and fall they often removed mats and took them for simple shelters while foraging along the river and adjacent uplands.

The Harder phase culminated thousands of years of adaptation to the Snake River environment. The lower Snake had gone from tundra cool, to a lush period when the river banks supported a rich diversity of plant and animal life, to a dry, desert-like climate. Through it all people lived along the river, making necessary adjustments to survive.

The differences between the various archaeological periods to this point had been gradual. Then the shift became abrupt. The Numipu Phase spans the period from A.D. 1750 to the 20th century and is marked by the coming of the horse and the availability of European trade goods.

The prehistory of the lower Snake ceased on October 10, 1805, when Lewis and Clark paddled into the stream. For several more decades the Palouse, Nez Perce, Wallula, Yakima, and Wanapum dominated the river, but their days of superiority were numbered.

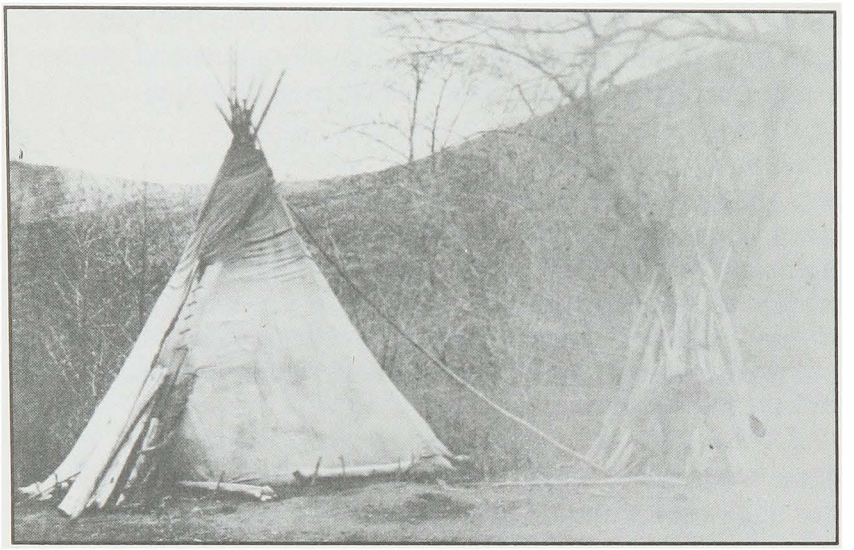
Of the lower Snake River's five phases of Indian life, the Numipu is the shortest, a little over 150 years, a period in which the river's native people rapidly reached their ultimate technological development and just as quickly declined, decimated by Euro–American diseases and chased from most of their homes by the invaders' greater numbers. The era began with a horse.

Traffic went both ways on the Bering Land Bridge. Settlers came to the Americas, but the Americas had at least one significant export: the horse. Thousands of years ago, horses roamed the American prairies. But they died out. That is, all except the ones making their way over the land bridge to Asia. Once in the Old World, people domesticated them and horses became the most important means of transportation in Asia and Europe. Spaniards reintroduced horses to the western hemisphere. Some escaped onto the plains of North America. Southwest Indians traded these horses to nomadic tribes in the north. The horse culture spread quickly, and by the early 1700s the Nez Perce probably owned some. [13]

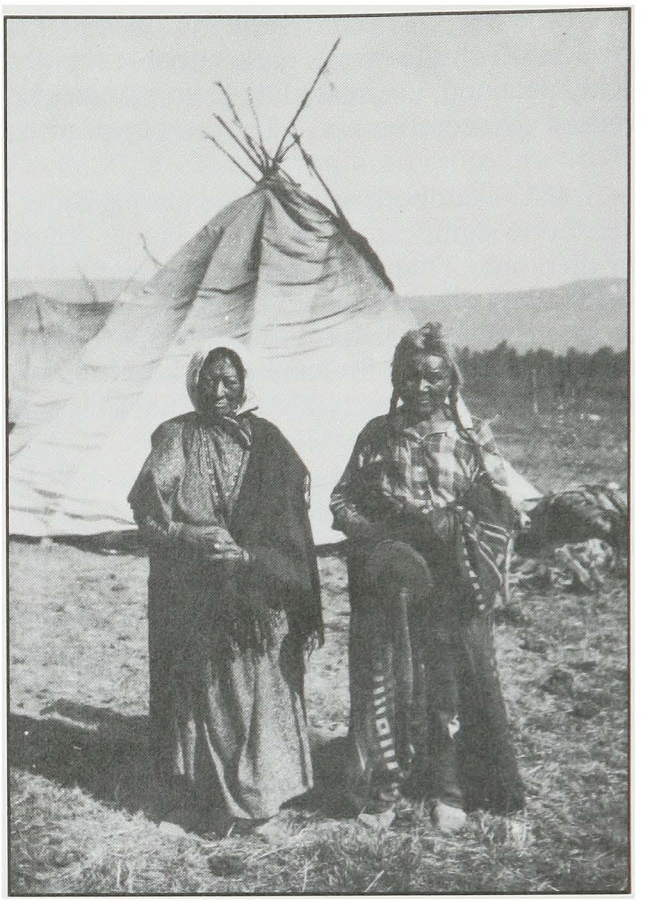
Nez Perce tradition notes that the tribe's first horse was a white mare heavy with foal purchased from the Shoshone. The mare lived in a village along the lower Snake at the mouth of Asotin Creek, and that horse and her colt spawned the thousands of Nez Perce horses the tribe eventually owned.

Probably within a generation of obtaining their first horse or horses, the Nez Perce learned how to use them, and with that knowledge came a dramatic lifestyle change. First, horses were pack animals, replacing dogs with their greater carrying power. Then Nez Perce learned to ride. Once they acquired this skill the Nez Perce and their Palouse Indian neighbors became masters at horsemanship.

Nez Perce village at Spalding.



Palouse of Nez Perce camp at Wawawai on the lower Snake.



Two Moons and his wife, Nez Perce Indians.

Thousands of horses thrived on the rich grasslands of the lower Snake country, protected from harsh winters and isolated from natural predators. The Nez Perce and Palouse counted their wealth in horses, and they were wealthy indeed. Perhaps alone among the Indian peoples of North America, the Nez Perce and Palouse practiced selective breeding. They castrated poorer stallions and traded inferior stock to neighboring tribes, breeding for stamina and speed.

Small bands of Nez Perce wanderers, who had previously ventured across the Bitterroot mountains on foot to hunt buffalo, now took to riding horses, enabling them to travel farther and carry home more dried meat and hides. Instead of a few foot travelers, whole villages crossed the Lolo and other trails. Horses also took Snake River people to the plains above the river to gather roots and grains and to hunt deer and antelope. They extended the tribe's network, enabling people to travel farther to visit and trade. The horse brought other changes. Snake River residents could now construct bigger pithouses because they could drag larger poles to the river. Increased mobility introduced Snake inhabitants to other lifestyles. They borrowed the concept of the tipi from Plains Indians, developed a more elaborate system of constructing graves, and acquired new tools. [14]

Obtaining horses changed the lifestyles of lower Snake people, but patterns established over thousands of years continued. The horse just made life easier and distances shorter.

During the Numipu period, Snake River Indians still lived in permanent villages along the stream. They constructed large gabled lodges used for meeting halls and multifamily dwellings as long as 150 feet. They placed tule mats or cattails over house poles, adorned insides with buffalo robes and animal skins, and slept on tule or rush mats. They covered some of the lodges with wood planks, especially in the lands closest to forests. People slept along inner walls and placed family fires in rows down the centers. Smoke escaped through openings in roofs along the ridgepoles. [15]

During spring, summer and fall, the river people made temporary villages on the plateaus as they hunted and gathered. They shaped these upland homes like tipis or small versions of their river lodges. They constructed the framework with unbarked, straight poles about 15 feet high and three inches in diameter. To these they lashed smaller horizontal sticks with rope or leather, then covered the whole with reeds twined together in mats, tying the mats to the pole framework.

Salmon remained the dietary staple. The people dipped them with nets, set weir traps, or speared them, often from platforms built over the water. People of the lower Snake waited expectantly for the arrival of the first salmon in spring, a time of excitement and feasting.

They supplemented their diets with a diversity of small and large game: rabbits, deer, elk, bear, antelope, buffalo. Men hunted the larger animals while women and children trapped the smaller. At times they held rabbit drives, capturing hundreds at once.

While men were hunting, women gathered roots, berries, nuts, and seeds. Particularly important were kouse and camas roots dug on the plains with sharpened sticks. The Snake River Indians' happiest communal times came while camping at the camas grounds, when people from many bands gathered to partake of the abundance, share stories, and play games.

When fully dressed, Nez Perce and Palouse men wore a breechcloth, shirt, leggings, moccasins, and blanket. Women dressed in skins also, wearing long, loose gowns with inner garments made of bark fiber. Women sometimes wore hats of twined basketry. Like their housing, which borrowed the tipi from the Plains and plank house from the Northwest Coast, their clothing reflected influences from both east and west.

After David Thompson established a trading post at Spokane in 1810, the Snake River people obtained metal blades and other trade goods, and by 1825, Indians all along the lower Snake had guns. At least by 1839, some Nez Perce or Palouse along the river were cultivating corn, and by the 1850s, Indians raised potatoes, corn, and wheat on benches along the river.

These were the lower Snake people that the first explorers encountered. The river people welcomed the whites. According to tribal tradition, an eastern band captured a Nez Perce woman in the 18th century. A white man purchased her and she lived with his family in Canada. The whites treated her kindly and healed her. She eventually left and made her way back to the Nez Perce. It was perhaps this woman Lewis and Clark met their first night on the Clearwater River, the one Clark noted had "seen white men," the one who told her tribe not to harm the white explorers because whites had been merciful to her. [16]

Throughout the early periods of exploration the Indians of the Snake treated whites with respect and friendship, serving as guides, providing food, and introducing the newcomers to their land. As the thin ranks of the explorers grew into the more numerous waves of miners, traders, and settlers clashes occurred. The Indians of the river fought well, but they had no chance against a people with superior numbers and weaponry. Indians continued to live along the river long after the period of exploration ended, though the river was no longer solely theirs. But it was these people, the Nez Perce and the Palouse, the Wallula, the Yakima and the Wanapum, that the next wanderers to the lower Snake, the explorers, found. Those exploration began in 1805.

Endnotes

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[1] For various theories on the settling of the Americas see Brian M. Fagan, *The Great Journey: The Peopling of Ancient America* (London: Thames and Hudson, 1987), esp. pp. 25–40. Jose de Acosta's quotation is on p. 28. Also very helpful in detailing the history of "early man" theories and research is Jose Luis Lorenzo, "Early Man Research in the American Hemisphere: Appraisal and Perspectives", in Alan Lyle Bryan, ed., *Early Man in America From a Circum–Pacific Perspective*, Occasional Papers #1 of the Department of Anthropology, University of Alberta (Edmonton: Archaeological Researches International, 1978), pp. 1–9.

[2] This is only a cursory summary of Beringia and various theories about when people made the crossing from Siberia. For some of the better sources on ancient man studies, particularly for nonspecialists, see Fagan, *The Great Journey;* Bryan, *Early Man in America*; David M. Hopkins, ed., *The Bering Land Bridge* (Stanford: Stanford University Press, 1967); Frederick Hadleigh *West, The Archaeology of Beringia* (New York: Columbia University Press, 1981); Jesse D. Jennings, ed., *Ancient Native Americans* (San Francisco: W.H. Freeman and Co., 1978); Richard Shutler, Jr., ed., *Early Man in the New World* (Beverly Hills: Sage Publications, 1983); L.S. Cressman, *Prehistory of the Far West: Homes of Vanished Peoples* (Salt Lake City: University of Utah Press, 1977); and an issue of *Arctic Anthropology*, 8:2 (1971) devoted to early man in North America. For recent evidence indicating the first American settlers might have arrived as early as 20,000 B.P. see Virginia Morell, "Confusion in Earliest America," *Science*, 248:4954 (27 Apr. 1990), pp. 439–41.

[3] While the description of the route covered in the peopling of the Americas is today the most accepted theory, there are some with other opinions. For example, some archaeologists believe the first migrations came down the west coast rather than through the ice–free corridor, and some archaeologists believe the peopling of North and South America took many thousands of years. For some of these contrarian views see Knut R. Fladmark, "The Feasibility of the Northwest Coast as a Migration Route for Early Man", pp. 119–28, and Lorenzo, Early Man Research in the American Hemisphere, pp. 1–9, both in Bryan, *Early Man in America*.

[4] This scenario is not the generally accepted view. Most archaeologists think the lower Snake River area was settled from the south, ancient wanderers first going down the east side of the Rockies and then filtering back up to the Snake from the Great Basin, or perhaps from California and southern Oregon. Obviously, because the Missoula floods destroyed most, if not all, evidence of any earlier occupation, it is speculative to guess the exact migration route to the lower Snake, whether very early from the north or later from the south.

[5] Quoted in *The National Observer*, 12 Mar. 1969.

[6] For details on the frantic work activity see Ruth Kirk, *Oldest Man in America: An Adventure in Archaeology* (New York: Harcourt Brace Jovanovich, 1970), esp. pp. 38, 45–6, 65; Gerald H. Grosso, "Cave Life on the Palouse," *Natural History*, 72:2 (Feb. 1967), p. 38–43; *Spokane Daily Chronicle*, 23 Feb. 1969; and Fryxell and Daugherty to Col. Robert Giesen, Walla Walla District Engineer, 16 Aug. 1968, RG 77, Acc. #T77–85–0022, WWD files, box 21, Seattle FRC.

[7] For the Corps' attempts to dissuade Magnuson from pursuing the levee see H.L. Drake, telephone record of conversation with Chief of Engineers Gen. William Cassidy, 19 Oct. 1968. For the efforts to dissuade Johnson see Maj. Harold Matthias, record of telephone conversation, 17 Oct. 1968. For the division of labor between the Walla Walla and Seattle Districts see R.W. Baunach, memorandum for Technical Engineering Branch files, 17 Sept. 1968. All are in RG 77, Acc. #T77–85–0022, WWD files, box 21, Seattle FRC. For additional background see *Seattle Times*, 27 Oct. 1968.

[8] The quotations are from P.W. Schneider, Director, Oregon State Game Commission, telegram to Hatfield, 30 Oct. 1968; and John Woodworth, Director, Idaho Fish and Game Department to Church, 24 Sept. 1968, Ibid. Also see the *National Observer*, 12 Mar. 1969.

[9] For the Corps' early concerns about seepage see Sydney Steinborn, Chief, Engineering Division, memorandum 4 Oct. 1968, RG 77, Acc. #T77–85–0022, WWD files, box 21, Seattle FRC.

[10] Harry Drake, interview with the authors, 27 Apr. 1992.

[11] For background on constructing the levee and reaction when water seeped behind it see Kirk, *Oldest Man in America*, pp. 80–91; and the following newspaper accounts: *Seattle Post–Intelligencer*, 11 Mar. 1969, 16 Mar. 1969; *Seattle Times*, 11 Mar. 1969; *Spokane Daily Chronicle*, 23 Feb. 1969; *Spokane Spokesman–Review*, 12 Mar. 1969; *National Observer*, 12 Mar. 1969. Also see Col. R.E. McConnell, Seattle District Engineer, interdepartmental memo, 5 Mar. 1969, RG 77, Acc. #T77–85–0018, WWD files, box 7, Seattle FRC.

[12] The following description of early lifestyles is taken from numerous published and unpublished materials by archaeologists who have worked in or know of the lower Snake region. See, among sources previously cited, Cressman, *Prehistory of the Far West;* Kirk, *Oldest Man in America*; and C. Melvin Aikens, "The Far West," in Jennings, *Ancient Native Americans.* Also see David G. Rice, *Preliminary Report: Marmes Rockshelter Archaeological Site*, Southern Columbia Plateau (Pullman: Washington State University Laboratory of Anthropology, 1969); Rice, "The Windust Phase in Lower Snake River Region Prehistory" (unpublished Ph.D. dissertation, Washington State University, 1972); Rice, "A Resource Protection Planning Process Identification and Evaluation for Prehistoric Archaeological Resources of the PaleoIndian Study Unit" (unpublished resource document prepared for the Washington State Office of Archaeology and Historic Preservation, 1985); Kirk and Richard Daugherty, *Discovering Washington Archaeology* (Seattle: University of Washington Press, 1978); Charles R. Nance, "45WT2: An Archaeological Site on the Lower Snake River" (unpublished masters thesis, Washington State University, 1966); Martha E. Yent, "The Cultural Sequence at Wawawai, Lower Snake River Region" (unpublished masters thesis, Washington State University, 1976); Glen S. Greene, "Prehistoric Utilization in the Channeled Scablands of Eastern Washington" (unpublished Ph.D. dissertation, Washington State University, 1975); Hallett H. Hammatt, "Late Quaternary Stratigraphy and Archaeological Chronology in the Lower Granite Reservoir Area, Lower Snake River" (unpublished Ph.D. dissertation, Washington State University, 1977); Madge L. Schwede, "An Ecological Study of Nez Perce Settlement Patterns" (unpublished masters thesis, Washington State University, 1966); Jerry R. Galm, et. al., "An Archaeological Overview of the Mid–Columbia Study Unit, Benton, Franklin, Klickitat, and Walla Walla Counties" (unpublished resource document prepared for the Washington State Office of Archaeology and Historic Preservation, 1985); John D. Combes, "Burial Practices as an Indicator of Cultural Change in the Lower Snake River Region" (unpublished masters thesis, Washington State University, 1968); and Paul E. Nezbitt, "Petroglyphs of the Snake River, Washington" (unpublished masters thesis, Washington State University, 1968).

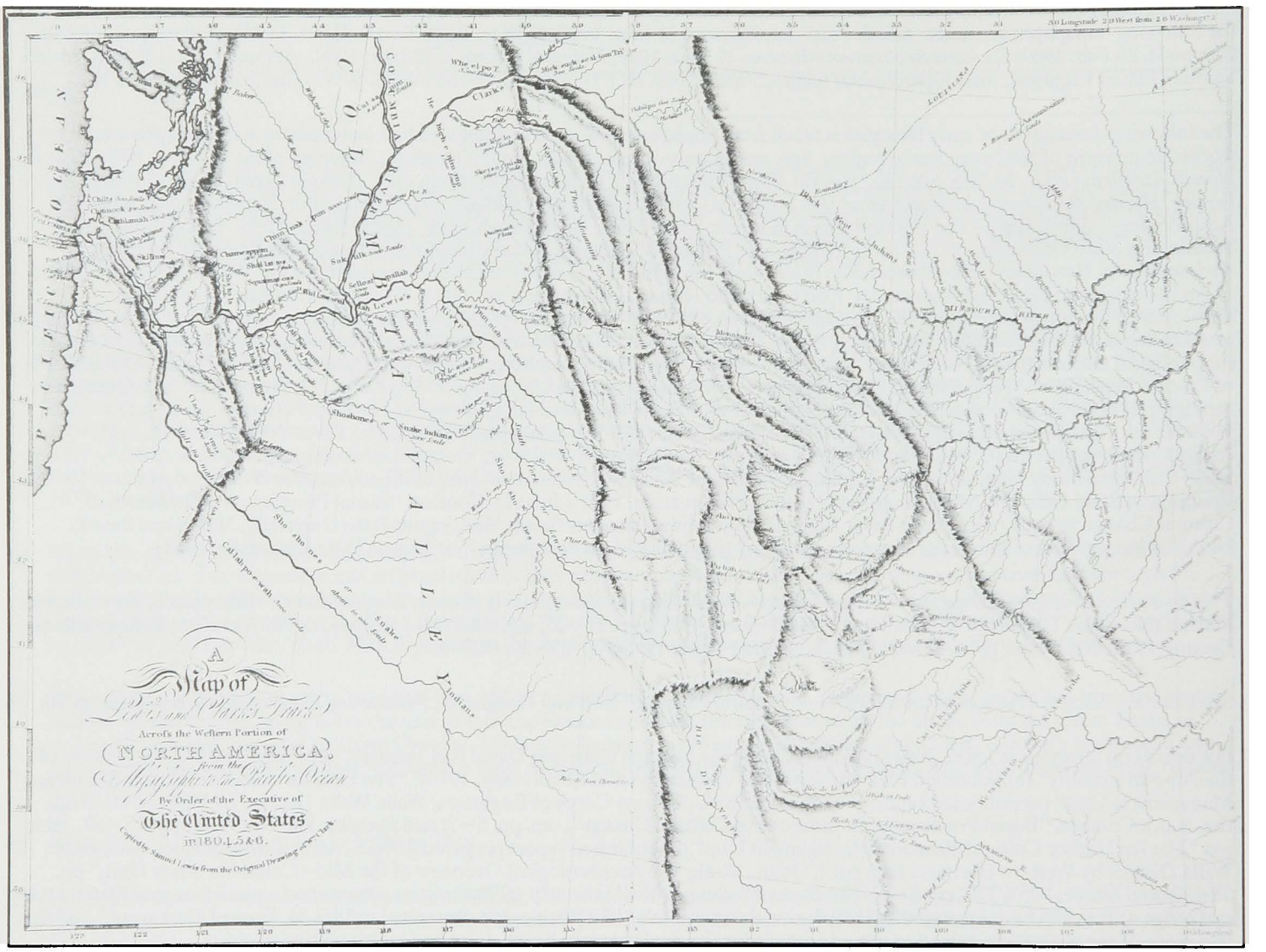
[13] This discussion of horses among lower Snake Indians comes primarily from Francis Haines, *The Nez Perces: Tribesmen of the Columbia Plateau* (Norman: University of Oklahoma Press, reprint., 1975), pp. 17–25; and Alvin M. Josephy, Jr., *The Nez Perce Indians and the Opening of the Northwest* (New Haven: Yale University Press, 1965), pp. 27–30, 648–9.

[14] See Combes, "Burial Practices as an Indicator of Cultural Change;" Kirk and Daugherty, *Discovering Washington Archaeology*, p. 70.

[15] For details on lifestyles of lower Snake residents during the Numipu phase see David Ray Brauner, "Alpowai: The Culture History of the Alpowa Locality" (unpublished Ph.D. dissertation, Washington State University, 1976); "The Granite–Goose Cultural Resource Management Unit" (unpublished report prepared for the U.S. Army Corps of Engineers, Walla Walla District, by Western Heritage, Inc., n.d.); Combes, "Burial Practices as an Indicator of Cultural Change", esp. pp. 5–7; and Josephy, *The Nez Perce*, pp. 15–39. Also see "The Ice Harbor Cultural Resource Management Unit" (unpublished report prepared for U.S. Army Corps of Engineers, Walla Walla District by Western Heritage, Inc., n.d.); Galm., et. al., "An Archaeological Overview of the Mid–Columbia Study Unit," pp. 38–40; and Nance, "45WT2," pp. 2–9. The Burke Museum at the University of Washington constructed a small seasonal Plateau tule mat lodge as it would have appeared in 1889 during the museum's 1989 Washington centennial exhibit "A Time of Gathering," and this fine piece of reconstruction helped to provide details for the small summer house described in this section.

[16] Josephy, *The Nez Perce*, pp. 37–8.

Lewis and Clark's map of the lower Snake region. They named the Snake River "Lewis's River."



Chapter 3
The Explorers

On October 10, 1805, Indians on horseback watched Meriwether Lewis and William Clark enter the Snake River. It was about 5 p.m. on a Thursday. Clark, Lewis, Sacajawea, Ordway, York, and the others of that expedition, explorers with names burned into a nation's memory, paddled out of the Clearwater into the lower Snake, the first non–Indians to see its "greenish blue" water with shoreline of "open Plain on either Side." And from that moment on, the river would change more dramatically than at any time in its long history. [1]

Lewis and Clark's Corps of Discovery awoke early on October 11, oared six miles through swift water, and stopped for breakfast. They descended what Clark called "Lewis's River," going ashore at a Palouse Indian [2] village to barter for fish, roots, and dogs. They had had limited hunting success, and dogs stilled the men's hunger for meat. Following breakfast they proceeded on, navigating nine violent rapids during the day.

They passed numerous other villages, for the Snake was well populated, although at this time of year most Indians were hunting in the Blue Mountains or gathering roots on adjacent prairies. They traveled though a steep–walled canyon, "not a tree of any kind to be Seen." After journeying about 30 miles they camped near the mouth of Almota Creek.

They made another 30 miles on October 12, until they reached what later navigators called Texas Rapids. "The Indians had told us [it] was very bad," Clark wrote. "We found [it] long and dangerous about 2 miles in length, and maney turns necessary to Stear Clare of the rocks, which appeared to be in every direction." They camped at the head of the cascade, saving their descent until the next day.

The following morning the party negotiated the rapids without mishap. Downstream they passed the mouth of the Palouse River, which they named Drewyers River to honor expedition member George Drouillard, spelled Drewyer throughout their journals. Few Indians appeared here, but at a different time of year the boaters would have witnessed the bustling village of Palus, largest community of the Palouse Indians.

Early the next morning they glided under "a remarkable rock verry large and resembling the hill [hull] of a Ship." Monumental Rock would later give its name to a dam. Palouse Indians led them through several treacherous rapids this day, but even expert guidance could not prevent one expedition canoe from striking a rock, upsetting all people and supplies. Indians and expedition members rescued the crew and saved many provisions. After completing only 15 miles the explorers beached on an island, laid their gear out to dry, and made camp.

The party passed eleven islands and rapids on October 15, some "verry bad and dificult." They camped at the head of Fish Hook Rapids, heeding their Indian guides who warned them of difficulties ahead.

With an Indian canoe leading the way, the expedition negotiated the rapids the next morning. One boat hit a rock, forcing a painstaking unloading. At Five Mile Rapids, crew members portaged rather than risk boating a hard three–quarters–of–a–mile trip packing heavy craft and supplies. Other Indians rode to the river to witness the expedition, and after the portage, explorers and Indians smoked together in friendship. Then the party proceeded down the last few miles of the Snake to its juncture with the Columbia. During their time on the lower Snake, the explorers had passed over 30 rapids worthy of noting in their journals; upset two canoes; experienced heat, cold, wind, and rain; and made the first written observations of the river.

The following year Lewis and Clark traveled the lower Snake country again, although on a different route. They trekked overland along the old Nez Perce Trail south of the river, reaching the Snake near Alpowa. They camped the night of May 4 just outside of the present site of Clarkston, then continued their journey east the next day. They hurried along the Snake this time, anxious to return home. But Lewis made some prophetic remarks about the land surrounding the river. "This country would form an extensive settlement," he wrote, "the climate appears quite as mild as that of similar latitude on the Atlantic coast if not more so and it cannot be otherwise than healthy; it possesses a fine dry pure air. . . . I have no doubt but this tract of country if cultivated would produce in great abundance every article essentially necessary to the comfort and subsistence of civillized man."

Lewis and Clark were the first of many to explore the lower Snake River. Over the next half century traders, trappers, soldiers, missionaries, navigators, and scientists came to the region.

David Thompson arrived in the West a year after Lewis and Clark returned to St. Louis. Since 1807, Thompson, along with Indian guides and French Canadian trappers, had set out annually from Canada's Great Plains to cross the Rockies, trade for furs, and establish posts for the North West Company in British Columbia, Idaho, Montana, and Washington. In 1811, Thompson investigated the lower Columbia River region, traveling past its confluence with the Snake on July 9. For years he had advocated more active British acquisition of Northwest lands. Had Thompson had his way, parts of Washington, Idaho, and Montana might today be in Canada. Thompson did attempt to claim some land. In the middle of an Indian village at the confluence of the Snake and Columbia he erected a pole with a "half sheet of paper well tied about it." On that paper he wrote: "Know hereby that this country is claimed by Great Britain as part of its Territories, and that the N.W. Company of Merchants from Canada, finding the Factory for this people inconvenient for them, do hereby intend to erect a factory at this place for the commerce of the country around."

Thompson's North West Company never did erect a "factory," or trading center, at the confluence, but seven years later it did build Fort Nez Perce just down the Columbia, a headquarters from which it dispatched expeditions of fur trappers into Idaho.

Thompson coursed briskly down the Columbia after posting his claim, then returned the following month with a small entourage. This time they entered the lower Snake, the first white party to navigate upstream along that river. Paddling for two days, they reached the Palouse Indian village at the mouth of the Palouse River. The Indians presented him with eight horses and, after spending the night, Thompson set out up the Palouse on a well–traveled Indian road to Spokane House, a trading post the Nor'Westers had constructed the previous year. [3]

The Pacific Fur Company, backed by New York entrepreneur John Jacob Astor, sent the third group that explored the lower Snake. Astor had dispatched two groups of men to the West to do economic battle with Britain's North West Company. One traveled by ship, establishing a headquarters at the mouth of the Columbia River known as Fort Astoria. The other went overland. In southern Idaho the second party, having attempted to navigate the "Accursed Mad River," Astorian parlance for the Snake, abandoned their boats and set out on foot to find a route to Astoria. The party splintered. One group went north through rugged terrain that got worse once they reached Hells Canyon. Trudging around the boiling river, they nearly starved, but made it through.

Donald McKenzie, a 300-pound Canadian, was one of the Astorians who struggled through Hells Canyon. In 1812, he led a small group of Astorians back up the Columbia and Snake rivers to the Clearwater. There, somewhere near the Clearwater's mouth--the site is not exactly known--he established a trading post, the first structure built by whites in the lower Snake River region. [4]

The Clearwater post never really had a chance. McKenzie would trade with the Nez Perce and Palouse Indians, but only in return for beaver pelts. The Indians had no intention of abandoning their seasonal hunting and gathering lifestyle, one adapted over many generations to insure survival, for the privilege of trapping flat-tailed rodents for whites.

McKenzie gave up and traveled inland to tell John Clarke, an Astorian trading with the Spokane Indians, that he was withdrawing from the Clearwater. While at the trading post at Spokane, Clarke and McKenzie learned that the United States and Great Britain were at war. The Astorians decided to leave the country. McKenzie returned to the Clearwater to fetch his cached goods, but discovered that some Nez Perce had pilfered them. In dealing firmly with the Indians, he eventually reclaimed most of his supplies. Although McKenzie thought the Nez Perce were a "rascally tribe," he attempted to deal with them honestly in his own fearless way.

Not so John Clarke, an overbearing, quick-tempered man. The previous year Clarke went up the Snake with McKenzie as far as the Palouse River. After storing canoes and some supplies, he purchased horses from the Palouse Indians and traveled inland. Returning in 1812 to the village of Palus, he found that Indians had taken items from his cache. One night his men caught an Indian stealing, and the next morning Clarke constructed a gallows and hanged him in full view of gathered Palouse and Nez Perce people. It was the first bloodshed between Indians and whites on the lower Snake. [5]

Despite all this early exploration along the lower Snake, people had a hard time figuring out just what to make of the place, whether it was good or worthless country. Early reports ranged from those of Meriwether Lewis, who saw glowing potential, to those like Alfred Seton of the Astorians, who found little to praise. "The country is plane, not a tree to be seen," he wrote, "a barren sandy desert producing a little wormwood [sagebrush], & in some places a few miserable tufts of grass." [6]

In 1828, English botanist David Douglas, who gave his name to the Pacific Northwest's most famous evergreen, traveled the land and seconded Seton's opinion:

> *We rose always at daybreak, and camped at 3 or 4 p.m., during which interval, the thermometer commonly standing in the shade at 108 degrees of Farenheit. . . . In the cool of the evening we generally made fifteen or twenty miles more. Except that good water may be obtained, there is nothing to render the country superior, in summer, to the burning deserts of Arabia. Salmon are caught in the river . . . but they are neither so plentiful nor so good as in the Columbia.* [7]

Though they were not yet sure of the country's potential, people continued to come. The roll of early explorers of the lower Snake reads something like a who's who of Western travelers.

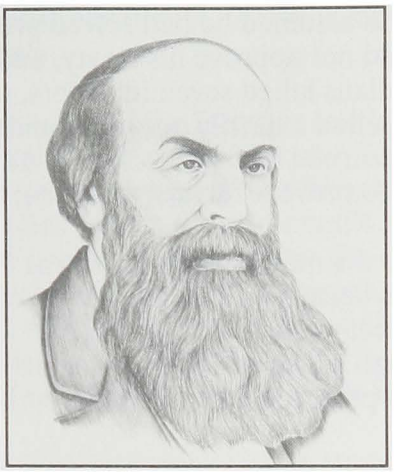
Peter Skene Ogden came. Ogden, the Hudson's Bay Company's outstanding explorer, traveled the West with a vengeance, trapping wherever he anticipated American competition. It was to Peter S. Ogden that Hudson's Bay Company officials turned when they decided to remake the West into a "fur desert" to prevent American ventures in the region. Ogden did his job well, trapping in places as distant as Idaho, Utah, Nevada, Oregon, and California. In 1825 he came down the Palouse River to the Snake, but discovered, like the Astorians before him, that this was not much of a fur country. [8]

If Ogden had an American equal it was Jedediah Smith, a brigade leader in William Ashley's fur enterprise. Smith, who explored more of the West than Peter Ogden, was a fitting rival. Indeed, Ogden later referred to "that damned all cursed day" when Smith entered the Snake River country. Smith, only 23 when he entered the West, died at age 30 in 1831. Two years before his death he traveled on the lower Snake and crossed to the Palouse River, then proceeded on to Spokane House. [9]

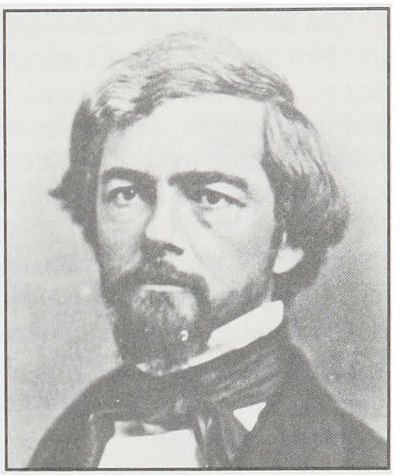
In 1841 a United States Navy expedition under Charles Wilkes scouted the Pacific rim and sent a few men inland to explore the Walla Walla and lower Snake region. By this time there had been considerable publicity about the area in eastern newspapers, written by missionaries and their families. Their reports were generally favorable, but William Breckenridge could not figure what all the ballyhoo was about and cast his lot in the long, confusing litany of whether this was a rich land or poor with those opting for the latter. "It appears to me," he wrote, "that we certainly must have viewed it in a very different light from the Majority of Writers that have come out so boldly in its favor." Not two acres out of a hundred north of Walla Walla would pay the farmer for his trouble, he predicted. [10]

If observers could not make up their minds about the land's quality, missionaries had no doubts the region was rich in potential converts. In 1832, the *Christian Advocate and Journal* of New York carried the story of four Indians who had traveled all the way from the inland northwest to St. Louis seeking the "whiteman's Book of Heaven." The American Board of Commissioners for Foreign Missions responded in 1835 by sending Marcus Whitman and Samuel Parker west. Whitman returned after meeting with Nez Perces at the fur traders' rendezvous in present–day Wyoming, but Parker continued to the lower Snake country.

Parker was a keen observer who left the most detailed description of the country since Lewis, Clark, and Thompson. He found the confluence of the Clearwater and Snake to "combine many advantages for a Missionary station," and was equally impressed with the region around Walla Walla. While Parker admitted the country had a "want of summer–rains," making it impossible for "some kinds of grain [to] flourish," he noted that cattle and horses grew fat on the rich bunchgrass, and, like Lewis and Clark, predicted a prosperous settlement. [11]



Henry Spalding



Isaac I. Stevens

Parker left for the East before Marcus Whitman and fellow missionary Henry Spalding arrived at Fort Vancouver in 1836. John McLoughlin, the Chief Factor of the Hudson's Bay Company post, informed them about Parker's suggestion of establishing missionary sites at Walla Walla and the Clearwater. Whitman went to Walla Walla and Spalding to the Clearwater, where both worked diligently but with increasingly limited success, until Cayuse Indians killed Whitman and others at Walla Walla in a classic clash of cultures.

The Whitman massacre of 1847 launched a decade of Indian–white confrontations that dramatically affected the lower Snake River country. After news of the Whitman deaths reached the Willamette Valley, a group of Oregon volunteers entered the Walla Walla country seeking revenge. The volunteers never did track down the guilty Cayuse Indians, but in 1848, the Cayuse themselves turned over five of their members, who were tried at Oregon City and hanged. [12]

By the early 1850s, contact between Indians and whites in the inland Northwest increased as emigrant trains, peddlers, prospectors, and railroad surveyors entered tribal lands. Settlers worried such incursions might lead to conflict. They also sought the right to settle and travel in Indian territory. In 1855, Washington's first territorial governor, Isaac Stevens, a former Army engineer officer, convened a two–week council in Walla Walla. According to an agreement Stevens thought he had wrenched from the gathered tribes, the Indians consented to remain within several large reservations. Whites were free to settle in and travel through the nonreserved lands.

Isaac Stevens was pleased as he rode out of the Walla Walla valley on June 16, 1855. His immediate duties shifted from Indian negotiator to landscape examiner, for Stevens was also scouting future railroad routes through the Northwest. For five days his party journeyed northward, to the Touchet River, the Tucannon, Pataha Creek, and finally the Snake. They followed that river a few miles, noting cornfields and orchards cultivated by Nez Perces and Palouses whom Henry Spalding had convinced to take up farming. Observing this productive land, Stevens cast his opinion with those who predicted a future wealth of settlements. He found this "a delightful rolling country, well grassed and arable," and was convinced the hills would make "a remarkably fine grazing and wheat country." [13]

As Stevens continued east, he assumed he had solved problems between Indians and whites in the inland Northwest. But Congress did not approve his treaty, and within a few weeks gold finds in Colville drew whites across reservation land. Indians killed seven intruders, some of whom they accused of stealing horses and raping women. They then repelled a hastily organized military expedition sent to the Yakima country, and what started as a police action turned into war. Cayuse, Yakima, Spokane, Palouse, Coeur d'Alene, and other tribes combined in an effort to prevent further reduction of their ancestral lands.

In 1857, the Army constructed a military post known as Fort Walla Walla as a means of keeping the peace. Tempers calmed for a while because the Army was theoretically just as interested in keeping whites from trespassing on Indian lands as it was in policing Indians. But in the spring of 1858, hostilities flared when, almost simultaneously, a small group of Palouse Indians stole some Army cattle and Colville miners petitioned the Army for additional protection after rumors spread that Indians had massacred a group en–route to the diggings.

Colonel Edward Steptoe took four companies into the Palouse country to discipline the cattle thieves, crossing the Snake at Alpowa. Predictably, the cattle rustlers evaded the cumbersome Army troops. Steptoe continued on to Colville to determine the nature of difficulties there. Spokane and Coeur d'Alene Indians, alarmed at this military invasion, intercepted the soldiers. Steptoe failed to convince them that he was on a peaceful mission and they attacked near Rosalia. Following a hard battle, Steptoe retreated in the middle of the night, making it to the Snake River where Chief Timothy's Nez Perce ferried his exhausted men to the south shore. It was the most significant military crossing ever along the lower Snake, preventing Steptoe's name from being linked in American history with the less fortunate George Custer. Once on the other side of the river, Steptoe withdrew to Walla Walla.

Nez Perce Chief Timothy saved Edward Steptoe's troops from disaster in the 1858 war.

News of "Steptoe's Disaster" swept the Pacific Northwest. Army commanders ordered Colonel George Wright to retaliate, and Wright did his job ruthlessly.

Wright brought a show of force never before seen in the interior, moving out from Fort Walla Walla in the summer of 1858 in command of twelve companies. Marching down the Tucannon, he built the only fort ever established on the lower Snake. Fort Taylor, named for an officer killed during Steptoe's withdrawal, barricaded with basalt rock and alder logs, lay on flat land at the Tucannon's mouth. Wright garrisoned it with one company, then pressed on into the plains. In a series of battles over the next month, he inflicted heavy casualties, killed hundreds of horses, and destroyed stores of food. Facing destruction, the Indians ended hostilities; and the United States Senate finally ratified Stevens' treaties of 1855. Although the government forced no immediate removal of interior tribes to designated reservations, Indian control over ancient lands and travel routes ended, clearing the way for white domination of the lower Snake. [14]

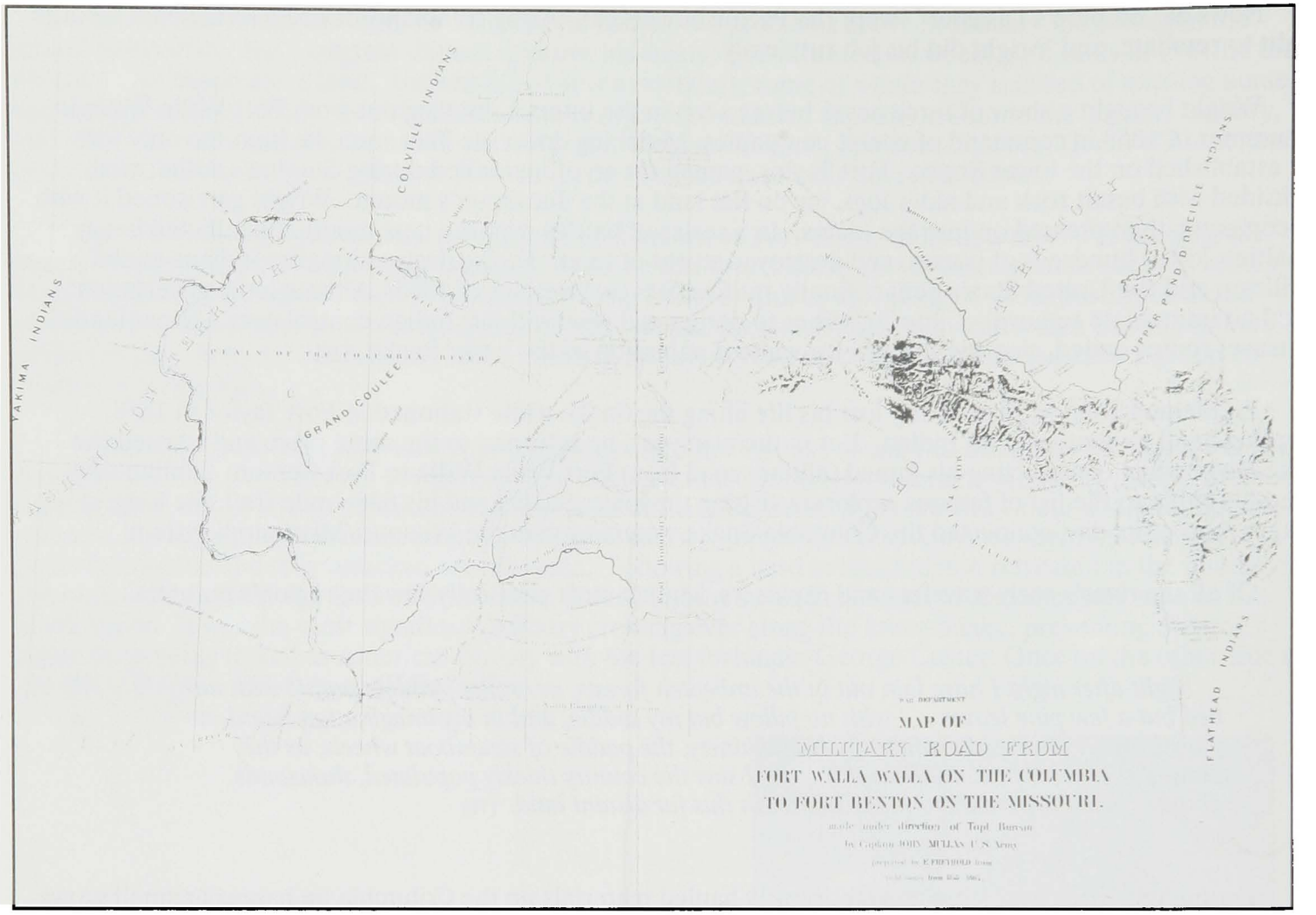
Lieutenant John Mullan nearly lost his life along the Snake while stationed at Fort Taylor in 1858, grappling hand to hand with an Indian. But in the next year, he returned to the same place and crossed the Snake River while constructing his famed military road from Fort Walla Walla to Fort Benton. Mullan thus added his name to the list of famous explorers visiting the lower Snake, and his 624–mile trail, the longest military road of its day, connected the Columbia/Snake waterway with the Missouri/Mississippi system.

Of all the river's early travelers and explorers, Mullan most poetically saw the region's potential:

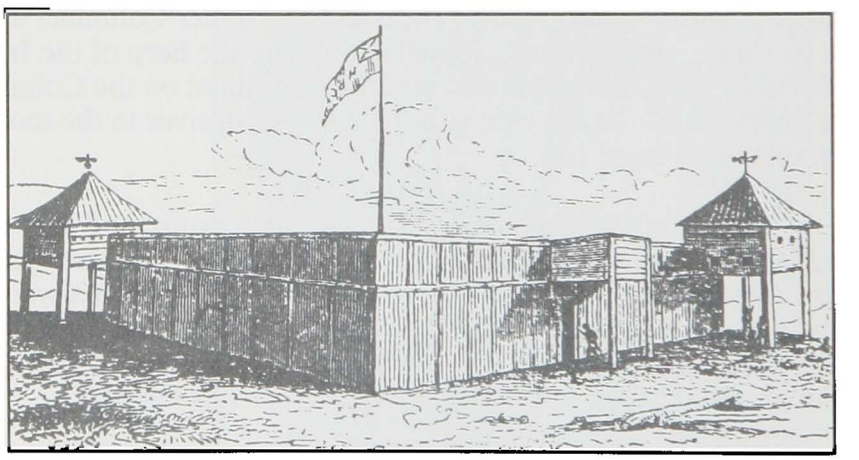
> *Night after night I have lain out in the unbeaten forests, or on the pathless prairie with no bed but a few pine leaves . . . with no pillow but my saddle, and in my imagination heard the whistle of an engine, the whirr of the machinery, the paddle of steamboat wheels, as they plowed the waters. . . . In my enthusiasm I saw the country thickly populated, thousands pouring over the borders to make homes in this far distant land.* [15]

During the 1850s war, suppliers laboriously hauled materials up the Columbia on barges or small scows to Walla Walla. In 1858, R.R. Thompson and L.W. Coe decided upon a better way. They constructed a steamboat above Celilo Falls to run along the upper Columbia and lower Snake rivers. They completed their boat in 1859, named it the *Colonel Wright* after the hero of the Indian campaigns, and hired Len White to guide it. In 1859, White piloted the first steamboat on the Columbia above The Dalles, taking supplies to Fort Walla Walla. In the next year he traveled upriver to the mouth of the Palouse, which the Army used as a forward supply base. [16]

Thompson and Coe made a considerable profit, and White proved the Columbia/Snake waterway navigable, at least by an able and courageous pilot. The same year Len White got as far as the Palouse River, Elias D. Pierce discovered gold above Lewiston on the Clearwater. White would lead an array of pilots and boats serving the lucrative mining trade, plying the lower Snake River in that stream's most glorious era of steam navigation. By then, so many white miners, settlers, and entrepreneurs crossed through the lower Snake region that the era of exploration effectively ended.



John Mullan's 1850s map of the lower Snake River.



Early Fort Walla Walla

Gustav Sohon's drawing of Fort Taylor in the lower Snake, used during the 1858 war.

The explorers--Lewis, Clark, Thompson, McKenzie, Douglas, Ogden, Parker, Stevens, Steptoe, Wright, Mullan, Jed and Len Smith and others--recorded their impressions of the river, its valley, its people, and the plains surrounding it. These men, among the most noted explorers in the American West, preceded and invited the most dramatic change ever to to come to this region that had been forged by fire and water and inhabited for thousands of years. And the most prophetic of them, people like Lewis and Clark, Parker and Mullan, accurately predicted the settlement and development ahead.

Endnotes

[1] For original journal entries of the expedition along the lower Snake and adjacent country see Reuben Gold Thwaites, ed., *Original Journals of the Lewis and Clark Expedition, 1804–1806* (New York: Antiquarian Press, reprint., 1959), vol. 3, pp. 101–122; vol. 4, pp. 348–62; vol. 5, pp. 11–13. For Sergeant John Ordway's account of the lower Snake passage, see Milo M. Quaife, ed., *The Journals of Captain Meriwether Lewis and Sergeant John Ordway* (Madison: State Historical Society of Wisconsin, reprint., 1965), pp. 268–72; 323–25. Also useful for specific Snake River references is Robert Lee Sappington, "The Lewis and Clark Expedition Among the Nez Perce Indians: The First Ethnographic Study in the Columbia Plateau," *Northwest Anthropological Research Notes,* 23:1 (Spring 1989), an article later reprinted in booklet form. Unless otherwise noted, details of the Lewis and Clark expedition along the lower Snake are taken from these sources, although readers should be aware that the literature on Lewis and Clark is voluminous.

[2] Lewis and Clark partially misidentified the Indians who lived along the lower Snake, believing all were Nez Perce. It was a mistake others would often repeat in coming years. Actually, this was primarily the home of the Palouse Indians. They shared the river with other groups, including the Nez Perce in the upper area nearest its confluence with the Clearwater. But the Palouse predominated. See Clifford E. Trafzer and Richard D. Sheuerman, *Renegade Tribe: The Palouse Indians and the Invasion of the Inland Pacific Northwest* (Pullman: Washington State University Press, 1986).

[3] For David Thompson, see J. B. Tyrell, ed., *David Thompson's Narrative of his Exploration in Western America,* vol. 12 (Toronto: Publications of the Champlain Society, 1916); and Rowland Bond, *The Original Northwester: David Thompson and the Native Tribes of North America* (Nine Mile Falls, WA: Spokane House Enterprises, 1970). For general overviews of Thompson's and other explorations along the lower Snake see Erwin N. Thompson, "Men and Events on Lower Snake River," *Idaho Yesterdays,* 5:3 (Fall 1961), pp. 10–15, 18–19; Albert W. Thompson, "The Early History of the Palouse River and Its Names," *Pacific Northwest Quarterly,* 62:2 (April 1971), pp. 69–76; and an excellent guide to all historic sites along the river, David H. Stratton and Glen W. Lindeman, *A Cultural Resources Survey for the United States Army Corps of Engineers, Walla Walla District,* Project Report #28 (Pullman: Washington Archaeological Research Center, 1976).

[4] For McKenzie and the Astorians, see Washington Irving, *Astoria, or Anecdotes of an Enterprise Beyond the Rocky Mountains* (numerous editions); Alexander Ross, *Adventures of the First Settlers on the Oregon or Columbia River* (London: Smith, Elder and Co., 1849); Ross, *The Fur Hunters of the Far West*, Kenneth A. Spaulding, ed. (Norman: University of Oklahoma Press, 1956); Gabriel Franchere, *Adventure at Astoria, 1810–1814*, Hoyt C. Franchere, ed. (Norman: University of Oklahoma Press, 1967); Jean C. Neilson, "Donald McKenzie in the Snake Country Fur Trade, 1816–1821," *Pacific Northwest Quarterly*, 31:2 (1940), pp. 161–79; and A.W. Thompson, "New Light on Donald MacKenzie's Post on the Clearwater, 1812–13", *Idaho Yesterdays*, 18:3 (Fall 1974), pp. 24–32.

[5] The best accounts of the Astorians' conflicts with Nez Perce and Palouse Indians can be found in Alvin M. Josephy, Jr., *The Nez Perce Indians and the Opening of the Northwest* (New Haven: Yale University Press, 1965), pp. 47–58; and Trafzer and Scheuerman, *Renegade Tribe*, pp. 14–18.

[6] Thompson, "New Light on MacKenzie's Post", p. 25.

[7] Douglas's quotation is in Thompson, "Men and Events on Lower Snake," p. 12.

[8] Ibid.

[9] Ibid. The quotation and a good brief description of Smith and his accomplishments can be found in Dorothy O. Johansen and Charles M. Gates, *Empire of the Columbia: A History of the Pacific Northwest* (New York: Harper & Row, 2d. ed., 1967), pp. 136–41. Also see Dale L. Morgan, *Jedediah Smith and the Opening of the West* (Lincoln: University of Nebraska Press, reprint., 1971).

[10] William Stanton, *The Great United States Exploring Expedition of 1838–1842* (Berkeley: University of California Press, 1975), p. 258.

[11] The quotations are in Thompson, "Men and Events on Lower Snake," p. 12; and D. W. Meinig, *The Great Columbia Plain: A Historical Geography, 1805–1910* (Seattle: University of Washington Press, 1968), p. 119–20.

[12] Josephy, *Nez Perce Indians*, pp. 274–76; Trafzer and Scheuerman, *Renegade Tribe*, pp. 27–30.

[13] For Stevens see Kent D. Richards, *Isaac I. Stevens: Young Man in a Hurry* (Provo: Brigham Young University Press, 1979); and U.S. Congress, *Reports of Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean*, 35th Cong., 2d Session, 1859, S. Ex. Doc. #46.

[14] Numerous accounts trace the history of the war of 1855–58. For some of the more accessible writings see Benjamin Franklin Manring, *Conquest of the Coeur d'Alenes, Spokanes & Palouses* (Fairfield, WA: Ye Galleon Press, 1975); Jerome Peltier, *Warbonnets and Epaulets* (Montreal: Payette Radio Limited, 1971); *We Were Not Summer Soldiers: The Indian War Diary of Plympton J. Kelly, 1855–1856* (Tacoma: Washington State Historical Society, 1976); Trafzer and Scheuerman, *Renegade Tribe*, pp. 60–92; Josephy, *The Nez Perce*, pp. 333–85; and Meinig, *Great Columbia Plain,* pp. 152–68.

[15] Quoted in Thompson, "Men and Events on Lower Snake," p. 19. Also see Mullan, *Report on the Construction of a Military Road from Fort Walla Walla to Fort Benton* (Washington: Government Printing Office, 1863); Louis C. Coleman and Leo Rieman, *Captain John Mullan; His Life Building the Mullan Road* (Montreal: Payette Radio Limited, 1968); and "The Granite Goose Cultural Resource Management Unit" (unpublished report prepared for the U.S. Army Corps of Engineers, Walla Walla District, by Western Heritage, Inc., n.d.), p. 36.

[16] Randall V. Mills, *Sternwheelers Up Columbia: A Century of Steamboating in the Oregon Country* (Palo Alto: Pacific Books, 1947), pp. 80–1.

Chapter 4
Settlement

After Colonel George Wright quieted the Indians, invasion of the inland country commenced unabated. Miners led the way. Some prospected on the legal side of the Indian/white territorial lines Isaac Stevens drew in 1855. Others, like Elias D. Pierce, ignored that treaty.

As miners pressed into crags and valleys of the inland Northwest, finding few promising claims, they looked enviously toward the Bitterroot Mountains, which they suspected held rich gold deposits. But the best route into these enticing mountains required crossing Nez Perce lands, and Pierce saw no reason not to.

In 1852, Pierce bought horses from the Nez Perce Indians, staying in their country just long enough to convince himself he could find gold on Indian lands if he spent time searching. But other schemes sidetracked him to California to work on an irrigation project and then to British Columbia to prospect. Not finding his bonanza in either place, he returned to Walla Walla six years later and resumed trading with Indians. [1]

In 1858, Pierce stopped along the Clearwater River where he hoped to test his theory about gold. But with Indians battling intrusive whites throughout the inland Northwest it seemed an inopportune time to begin a prospecting expedition, even in friendly Nez Perce country. Pierce waited out hostilities.

Early in 1860, he returned to the Clearwater with a companion and found a few cents worth of color. It was not much, but finding real treasure, Pierce believed, required only more time, more people, and more supplies. "[I] knew I had the . . . destiny of that country, and that I could flood the entire region with good reliable men at my option," he later wrote. First he would have to overcome opposition from a few people with more scruples about obeying government treaties. But in the end he proved to be right. [2]

Prospector on the Clearwater River.

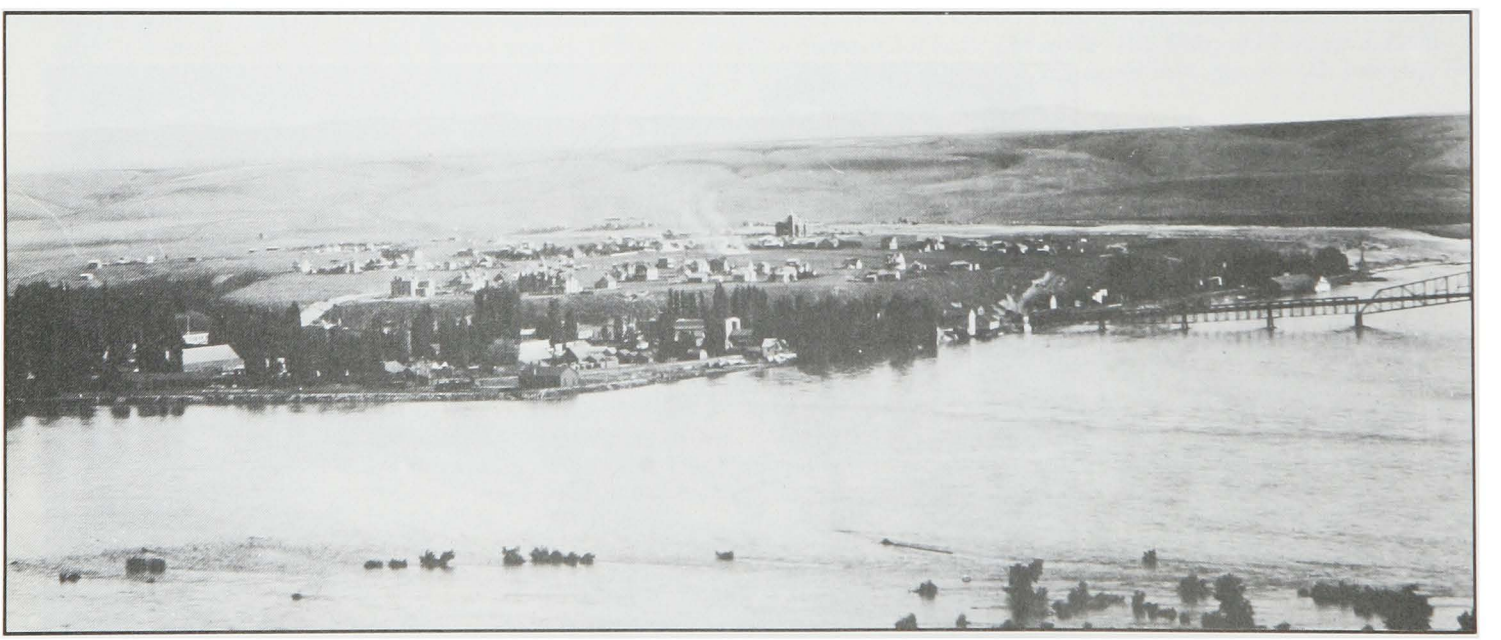
Indian agent A.J. Cain, stationed in Walla Walla, tried to dissuade Pierce, even though the prospector assured Cain his discoveries lay outside the Nez Perce reservation line. Despite Cain's admonitions, Pierce went back to the Clearwater, found more gold, and brought the news to Walla Walla. "This country has been bought and paid for by the United States Government and consequently is not on holy ground," Pierce told a town rally. Walla Walla businessmen, eager for trade, were not about to sit idly while an Indian agent barred potential customers from the gold fields. [3]

Pierce returned to the Clearwater again, this time with ten men. They found ore in nearly every stream. Their success electrified the West. Newspapers in Portland, Puget Sound, and California reported the discoveries, and by late 1860, hundreds of miners had entered the country.

In April 1861, recognizing they could not restrain miners from Nez Perce lands, A.J. Cain and Edward Geary, Superintendent of Indian Affairs for Oregon and Washington, convinced Lawyer, a head man of the Nez Perce, to relinquish mining grounds north of the Clearwater in exchange for $50,000. There is no indication any of the money ever reached the Nez Perce, but it really did not matter. The ink had hardly dried on that treaty before white miners began violating it.

Each day, more prospectors streamed into the country, crisscrossing all over the mountains. Many ventured south of the Clearwater into the Salmon River country, directly violating the new treaty. Transgressions became flagrant, but none more so than the establishment of Lewiston, at the confluence of the Snake and Clearwater rivers, a town of tents that boomed into a thriving trading center, built in the heart of sacred Nez Perce land.

By 1862, white population in Washington Territory east of the Cascade Mountains surpassed that on the west side. A year later, President Abraham Lincoln, responding to political pressure from settlers who felt isolated from the seat of government near Puget Sound, established a new territory of Idaho, embracing all of present–day Idaho and Montana and most of Wyoming. Lewiston became its capital.



Lewiston always owed its livelihood to the Snake and navigation.

Government officials soon began pressing the Nez Perce for access to even more land, hoping to legitimize trespasses at Lewiston and in the mining regions. A new treaty conference began in May 1863, driving a final wedge between two factions of the Nez Perce. In June, some Nez Perce headmen, including Lawyer, signed a treaty that the government's negotiator boasted "relinquished . . . nearly six millions of acres . . . at a cost not exceeding eight cents per acre." Other headmen, such as Joseph, Big Thunder, and White Bird, refused to sign. In the name of the Nez Perce, Lawyer gave up 90 percent of former reservation lands. Although the treaty "legalized" the new white settlement at Lewiston, it also foreshadowed difficulties between whites and nontreaty Indians that led to the Nez Perce War of 1877. [4]

Over 50 years after Lewis and Clark first explored the region, Idaho's Clearwater gold fields remained isolated from other white settlements. But Pierce's discovery ignited an explosion of miners into the region. Steamboats provided their transportation, carrying over 60,000 miners, traders, gamblers, bartenders, entrepreneurs, and curiosity seekers into the Idaho mines between 1861 and 1863. Some of the boats stopped at Wallula on the Columbia River, dropping off passengers to continue the journey overland. But many ventured on, up the lower Snake, all the way to Lewiston, the hub of mining activity. The *Colonel Wright* and Leonard White, the first boat and the first captain to steam into the lower Snake in 1860, also pioneered the route to Lewiston in 1861. [5]

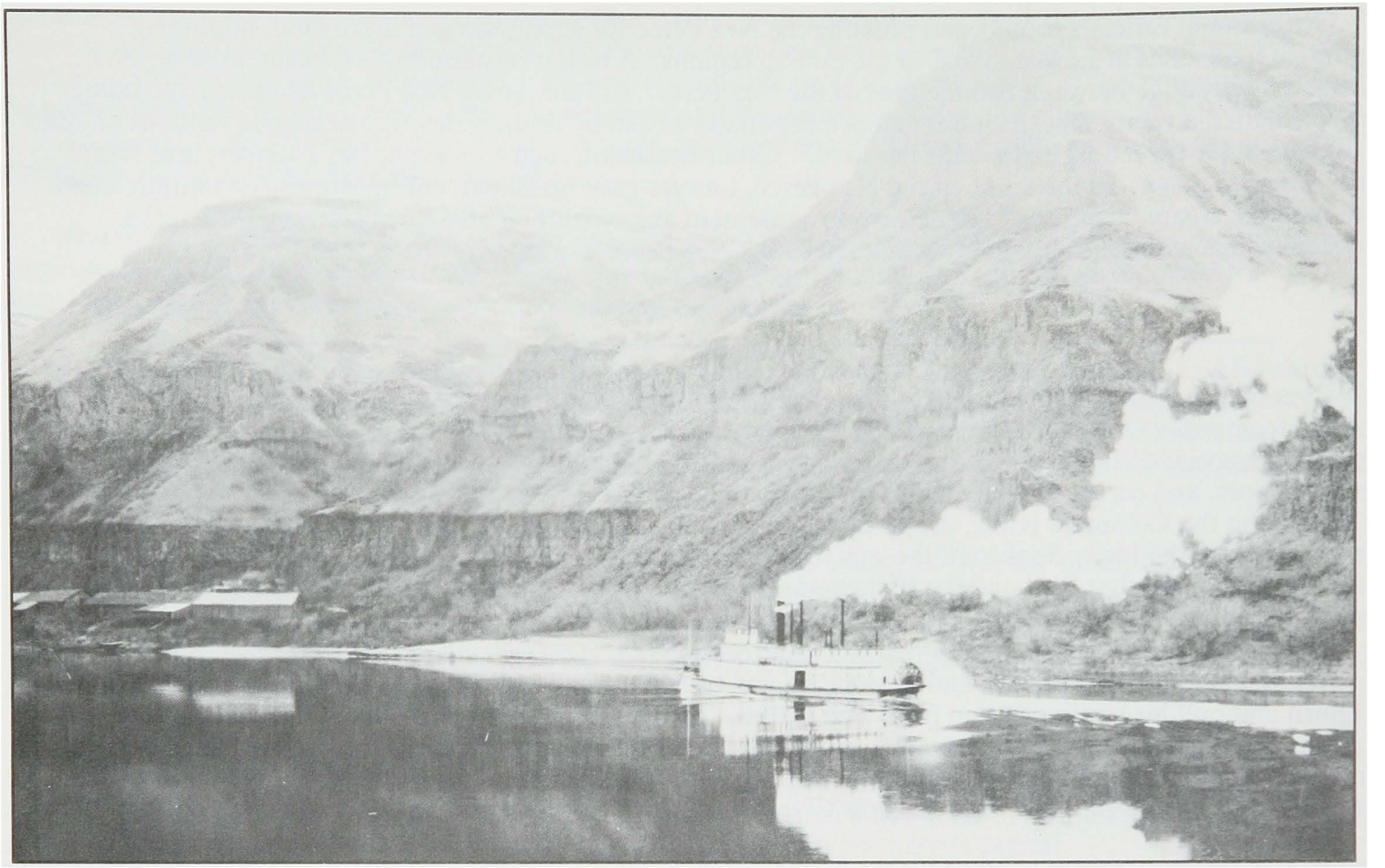
White unloaded his supplies and passengers and turned around. It had taken three–and–one–half days to churn and pull his boat upstream from The Dalles. The return trip took 18 hours. Only courageous captains would attempt the fast–flowing route along the Columbia and Snake rivers, but the trade proved lucrative. Once White proved the lower Snake navigable, others followed; and soon the *Spray*, the *Cacadilla*, the *Tenino*, the *Okanogan*, and the *Nez Perce Chief* joined the *Colonel Wright* in supplying Lewiston.

Riding the sternwheelers could be seen as a luxurious experience. Henry Miller made the trip to the mines in 1861, observing "gentlemen . . . [who] view the scenery, smoke Havana cigars, and quaff Champagne cocktails." Passengers could eat food better prepared than at most hotels, frequently including fresh–caught salmon ceremoniously presented in elaborate dining salons. [6]

But the lower Snake remained a wild river; the 30 or so rapids Lewis and Clark encountered still endured. This was no easy excursion for steamer crews. At times, even a fearless captain like Len White could not get through. Generally, the Snake ran too low from November through April for steamboats to navigate. During the height of the gold rush, Lewiston merchants became so desperate for supplies during these months that they offered bonuses to the first boat making it upriver in the spring.

The best navigation, from late spring through early summer, came when high water covered rocks and flattened rapids. Even then, steering a course through the Snake required skill. Boats arriving too early might have to wait for high water, moored in a place a few miles above the Snake's confluence with the Columbia, a safe refuge rivermen called Ice Harbor. If they operated too close to a canyon rim they might run onto a gravel bar. Sometimes engines reversed at full throttle could not pull the boat off a bar, and an enterprising captain might resort to drilling holes in the stern, allowing in water so the bow would rise above the gravel.

Even if crews encountered no serious problems they still had to negotiate places like Pine Tree, Palouse, and Texas rapids, places that remained rough no matter the time of year. Henry Miller described the ordeal at Palouse Rapids:



Despite the river's many rapids, numerous sternwheeled steamboats plied the lower Snake in the late 1800s.

> *The ascent . . . baffles all generally received notions in regard to steamboat navigation. In three quarters of a mile there is an ascent of at least six feet. The water is lashed into billows capped with foam, and the feat of ascending them looks fool–hardy. But we take a running jump right into the centre of the rapids; and inch by inch the boat goes bravely up. The waves strike her sides as if she were thumping on the rocks. Sometimes the 'upper–tow' will carry her ahead half a length at a time, and then she will stand trembling for minutes in a place, or sheer from side to side as if complaining at the labor forced upon her. In an hour and a quarter we made three–quarters of a mile.* [7]

And that represented an easy trip. Coming upon such cascades during shallow water periods, crewmen had to venture ashore with a huge piece of timber, wedge it between rocks above the head of the rapids, and fasten a line around its middle, running it to an iron capstan on the boat's foredeck. As the rope coiled around the capstan with engines churning mightily, the boat literally dragged itself upstream. When more boats plied the lower Snake, rivermen sank iron rings into boulders, a more reliable and durable navigational aid.

Although it was no easy task negotiating the lower Snake, skilled boatmen completed the runs without mishap in the 1860s. Lewiston grew complacent: townspeople no longer worried whether boats would make it, only when they would arrive. And the business community became impatient, especially after prospectors

discovered color in the Boise Basin. Why not send boats farther upstream, all the way to Boise, and supply those gold fields from the territorial capital?

Lewiston dispatched a scouting expedition to determine the navigability of the river to Boise. The town's *Golden Age* reported the result:

> *They found nothing in the river to impede navigation whatever. . . .The Snake is navigable for steamers, and will be much safer to travel than the river is from Lewiston to the mouth. . . . A new route will now be opened for steam, the results of which cannot now be foretold. We shall penetrate Nevada and Utah Territories by steam, as it is well known that it is only 90 miles from Fort Boise to Salmon Falls [and] . . . Salmon Falls is within 250 miles of Salt Lake City.* [8]

The only thing between Lewiston and Fort Boise, that is, was 135 miles of river, dozens of rapids, and Hells Canyon. One suspects Lewiston's glowing report did not dupe experienced riverman Thomas Stump. He had no doubt read other less rapturous stories about Hells Canyon. But he felt up to its challenge.

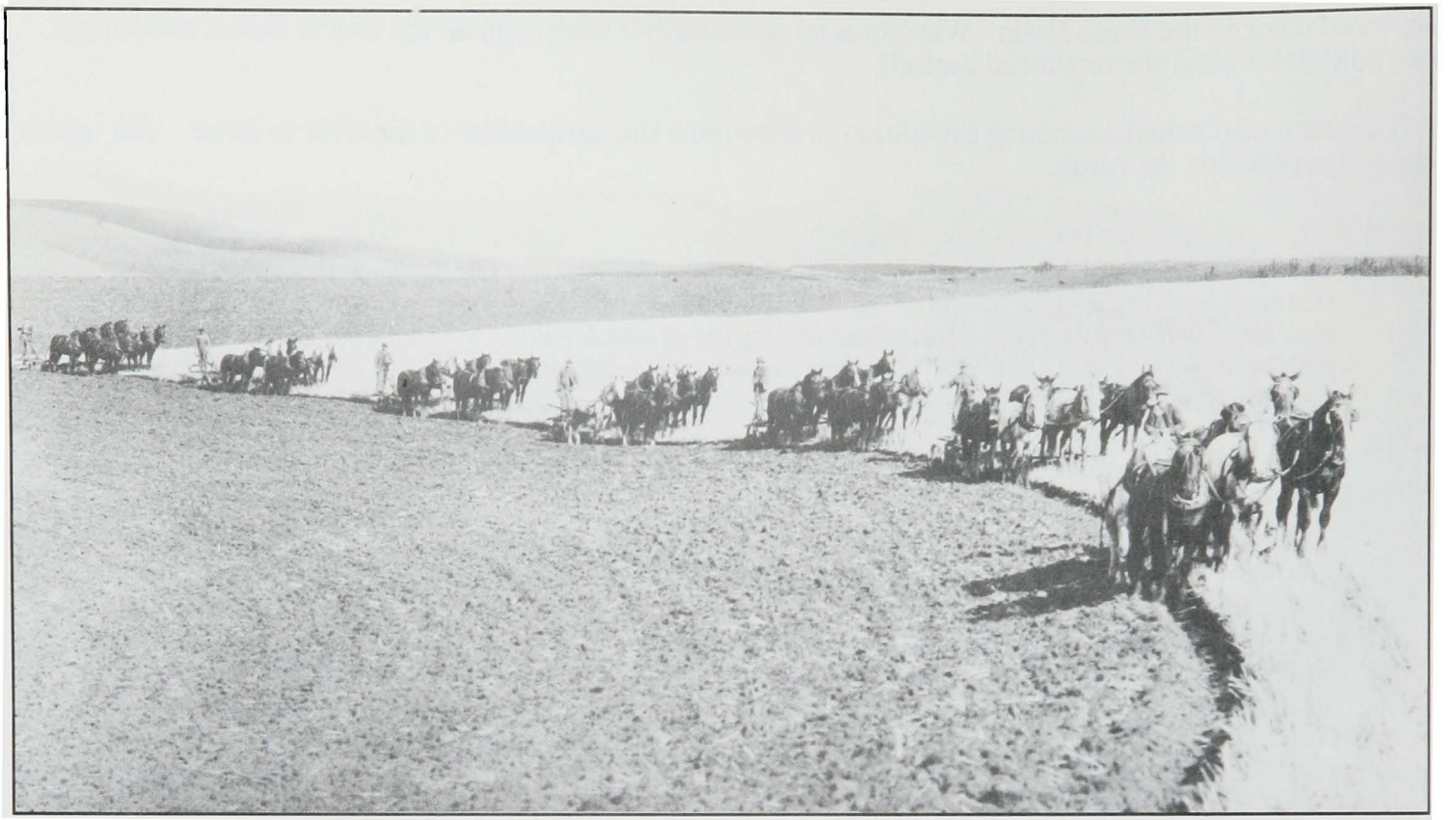
Stump had replaced the intrepid Len White as Captain of the *Colonel Wright*, and though he lacked White's flamboyance, he was a skilled and adventuresome boatman commanding the most versatile steamer on the river. In 1865, he set out from Lewiston, churning and winching his boat up the canyon for four and one-half days. Then, about 80 miles above town, the current casually tossed his sternwheeler into a jagged reef, ripping away eight feet of bow. Stump beached his vessel, repaired the bulkhead, and turned back to Lewiston, covering the distance in three-and-a-half hours. The trip proved too much for the sturdy boat; its owners could salvage only the engine. [9]

Not only did this scheme to open a supply route to the Boise gold fields fail, but the amount of mineral taken from the Clearwater and Salmon river fields also shrank dramatically. Miners moved on to Boise, Virginia City, the lower Kootenay, Helena, and other western bonanzas. Lewiston stagnated as Idaho's population shifted south. Boise became the territorial capital, and boat traffic to Lewiston dwindled to weekly excursions. The lower Snake quietly awaited its next rush, its next influx of steamers. That boom would come from tilling the soil, not digging for minerals.

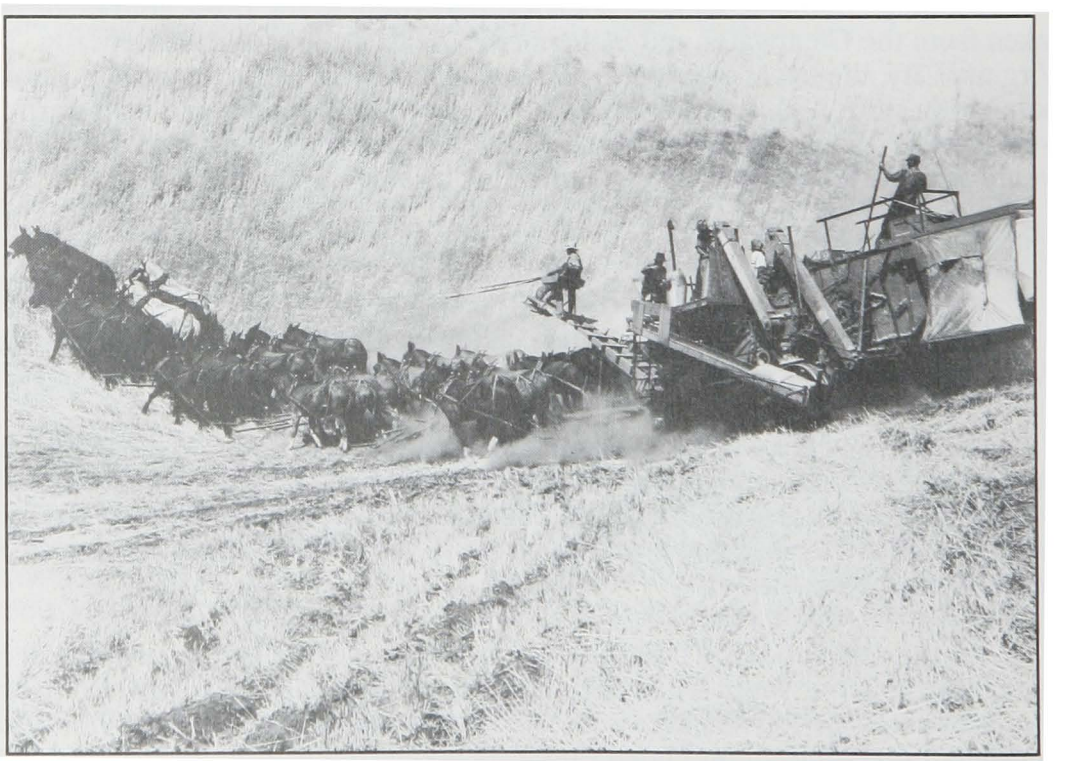
Miners needed food, and ranchers and farmers followed them inland. Most farmers settled around Walla Walla, tilling flat valley floors, believing the soil on steeply sloped hillsides nearer the Snake infertile.

That opened the way for stockmen to move into the lower Snake region, and their cattle and sheep grew fat on the hills' luxuriant bunchgrass. Soon eastern Washington cattlemen trailed stock to British Columbia, Montana, Oregon, Puget Sound, and Idaho, eventually driving them all the way to Cheyenne, Wyoming, and selling to buyers from Omaha and Chicago. In 1879, cattlemen drove over 70,000 head of eastern Washington cattle to Cheyenne.

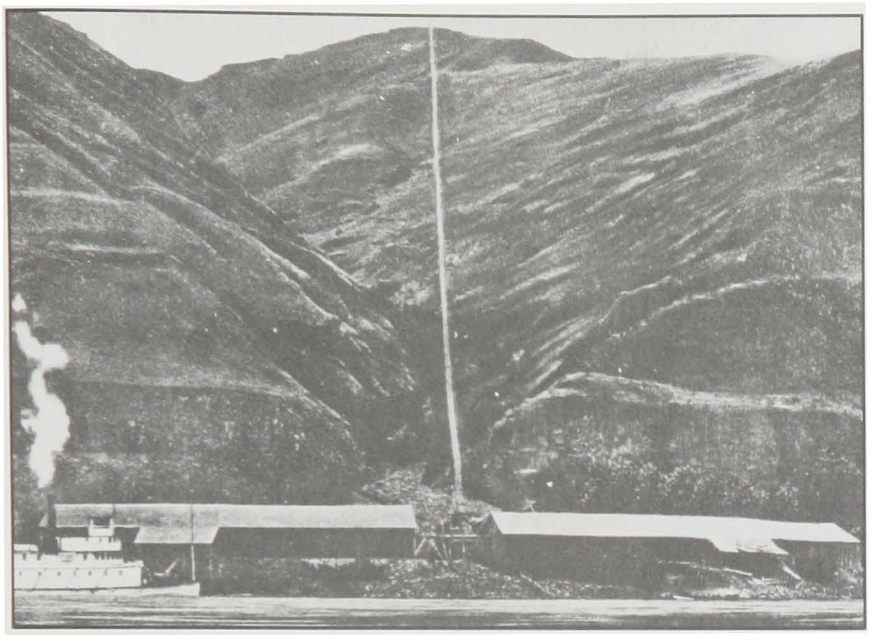
But the region proved inhospitable. A series of cattle-killing winters decimated herds. Of an estimated 10,000 cattle in the Walla Walla area in 1861, perhaps only 1,000 survived that year's harsh storms. The winter of 1880-81 left stacks of sun-bleached bones visible to settlers for decades. A few herds remained, but that devastating winter ended the cattle boom. [10]



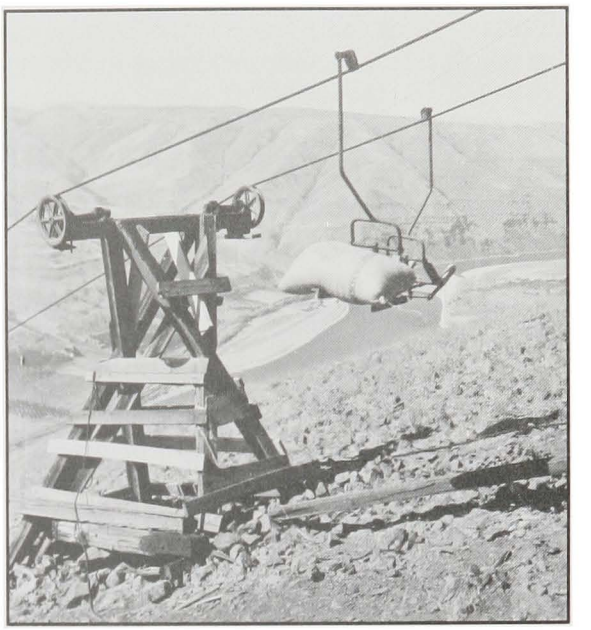
When farmers discovered that the fertile hills surrounding the lower Snake produced abundant crops of wheat, they set off a settlement boom -- and a desire for a navigable waterway to get their product to market.



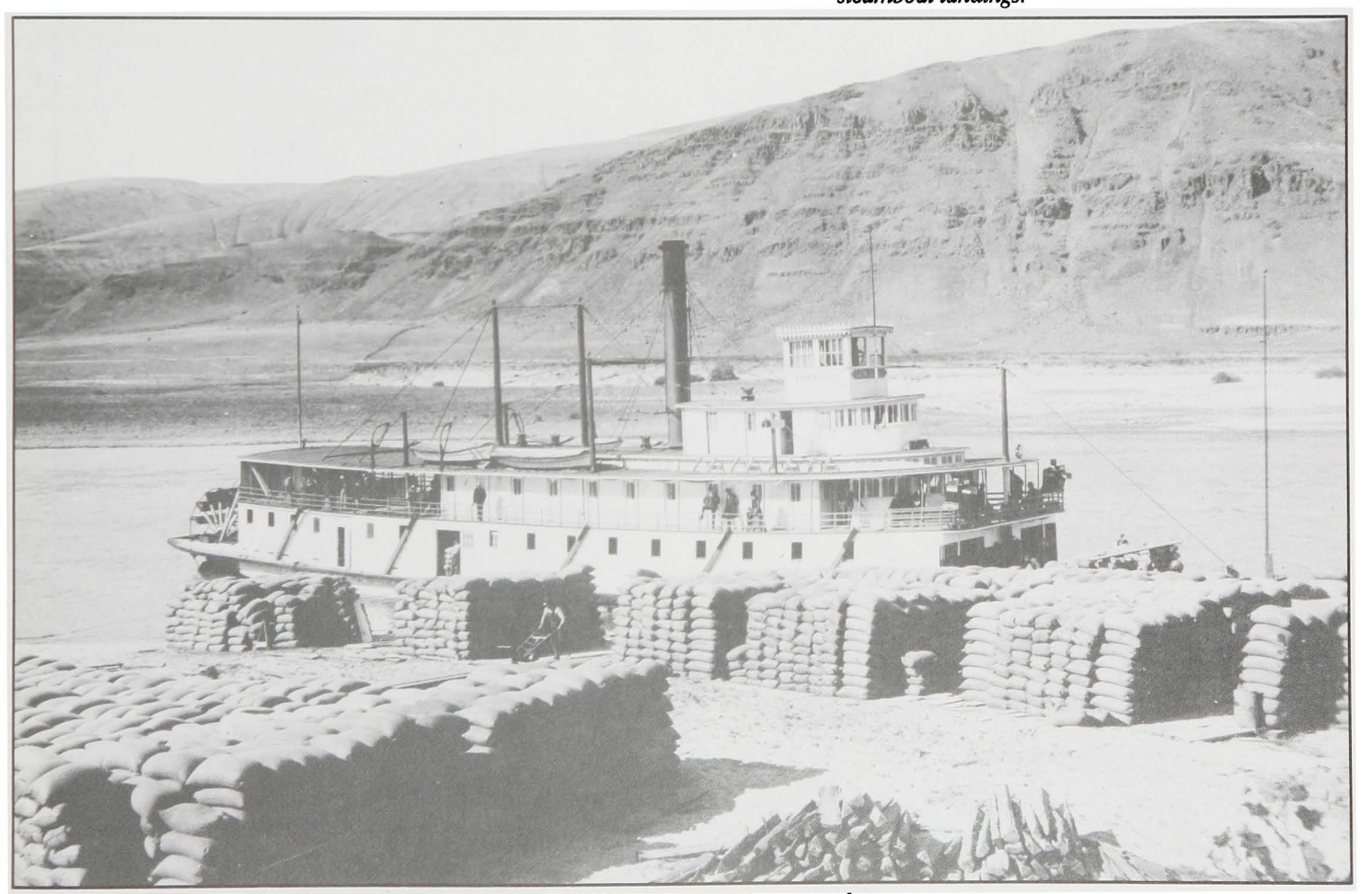
Wheat farming in the Palouse region.



Grain chute on the lower Snake.



Tramways and, before them, grain chutes, transported wheat from the plateau down the steep river canyon to steamboat landings.



The Snake River's wheat fleet transported grain to Portland for shipment to overseas markets.

Tramway at Wawawai on the Snake.

The lower Snake region's wheat fields remain productive today.

The discovery that farmers could profitably till the steep hills above the river brought the most dramatic lifestyle change in lower Snake history. When an unknown but enterprising farmer discovered that the area's riches lay in its hilltops, the settlement rush began, quickly filling the region in the 1870s and 1880s. [11]

The hills proved to be fruitful, indeed. Covered with the fertile loess deposited by glacial winds, the Palouse and surrounding regions contained some of the richest topsoil in the world and soon yielded some of the nation's most abundant grain crops. Wheat quickly became king.

People could not profit from such abundance, however, unless they could ship their crops to market. Before the arrival of the railroads in the 1880s, the only route out was by steamboat. But that was no simple task.

The first problem came in transporting the wheat down to river banks. The lower Snake cuts a canyon that is in places more than 2,000 feet below productive farm land, and the richest agricultural country lies in the northwest, the section highest above the river. The simplest solution was an exhausting scramble down the canyon rim by horse and wagon. Sometimes drivers tied logs or brush behind to slow their descent. The roads themselves contained many switchbacks, and in some places imaginative farmers constructed turntables allowing wagons and teams to negotiate sharp corners. But this was no way to get huge crops to market, and inventive settlers searched for other methods. [12]

Major Sewell Truax constructed a 3,200–foot grain chute down the banks of the Snake in 1879, but his effort hardly became an instant success. Workers had to unsack wheat at the top, pour it into the four–inch pipe, then resack it at the bottom. It was time consuming and hazardous, and friction often pulverized the grain. After a couple of years Truax installed baffles which slowed the descent, but also caused the chute to clog.

Primitive though it was, Truax's device proved more efficient than hauling wheat downhill by wagon, and within a few years other chutes lined both sides of the river. The bucket tramway, an even more ingenious system, soon replaced them. Farmers would take wagons full of sacked wheat and journey to the head of the nearest tram. There they unloaded the wheat, sack by sack, placing each on arm–like metal projections attached to heavy cables. Poles and towers running up canyon walls supported the cables.

Bucket trams ran by gravity with loaded wheat going down forcing unloaded "buckets," or arms, up in a perpetual motion. The trams had two major advantages over grain chutes: they created no friction, and workers did not have to unsack and then resack wheat prior to shipping.

Area farmers constantly sought faster methods of shipping grain down to riverbanks. Their search led to the most efficient method devised to get wheat down mountain slopes before trucks and highways: the rail tram. In the 1880s, workers in Garfield County built what was probably the first rail tram to the Snake. Wooden tracks covered with strap iron coursed down the hillside. A cable with a car attached to each end, looped over a pulley at the top. Workers loaded the upper car with wheat and, when started downhill, it pulled the empty buggy up. Halfway down, the tracks split so the cars could pass each other. In 1891, residents of May View dismantled this tram, using its parts to build the May View tramway about a mile away, the biggest and longest lasting of the region's many trams.

The May View tramway and a few other Snake River grain conveyances operated into the 1940s. Originally developed to haul grain to steamboat landings, they survived by sending crops to railroad sidings long after steamer traffic ceased. But their peak operation came in the glory days of Snake River steam navigation, when the "Wheat Fleet" supplied the world with Inland Empire grain.

The initial shipment of Northwest wheat went from Portland to Liverpool, England in 1869, and for nearly half a century tall–masted ships sailed across the Atlantic carrying grain. By 1870, five vessels regularly transported wheat from Portland; 81 made the run in 1879; and by the 1880s, more than 100 serviced the city.

Upstream at small towns along the lower Snake River, sturdy little sternwheelers visited the ports. Were it not for these lower Snake steamers, Portland would have had far fewer ships at its docks, for the Inland Empire increasingly provided the bulk of wheat shipped from the Rose City.

The first load of wheat went down the lower Snake in 1876, traveling from Almota to Portland. It proved to be a lucrative trip, and the Snake River's wheat fleet soon numbered sixteen steamers, more than had ever catered to miners. The boats brought machinery, supplies, and mail upstream and hauled wheat downstream. In days before railroads the lower Snake served as an essential lifeline to residents along and above the river. A network of towns, farms, and transportation systems flourished. [13]

Although most people resided on the prairies above the river, some lived along the Snake, populating many communities. Some, like Asotin, Clarkston, and Lewiston have endured. But most of the small and numerous Snake River towns, places like Ainsworth, Almota, Ayer, Farrington, Grange City, Illia, Joso, Levey, Magallon, Matthews, Moore, Page, Penewawa, Riparia, The Riviera, Scott, Sheffler, Silcott, Simmons, Snake River Junction, Walker, and Wawawai, disappeared. The stories of a few of these communities can serve to exemplify all. One of the more interesting was The Riviera.

About halfway down the lower Snake, Little Goose Dam now forms a reservoir known as Lake Bryan. Just upstream, on the south bank, Enoch A. Bryan platted a little town. No Snake River community began with loftier goals; few had shorter lives.

Bryan, a student and writer of Northwest history, served as Commissioner of Education for the State of Idaho. But at the time he envisioned his Snake River utopia, he was president of the state college of Washington at Pullman.

In about 1910, Bryan bought riverfront property, platted a town with 73 lots, and printed stationery for "The Riviera Co." He published enticing brochures. "The Riviera Co. owns a beautiful tract of irrigable land on Snake River in Columbia County, Washington," his flyers said. "The Snake River Canyon is the best land and safest from frost for peaches, apricots, grapes, apples, and small fruits, in the State of Washington. . . . The tract will accommodate about fifty families." Bryan planned to irrigate lush fruit orchards with Snake River water. He would start a school, a store, a church––everything residents needed to live in isolated bliss.

A few folks came. He sold three lots. He built a store, a home, a school, and a church. He pumped irrigation water from the river with gasoline engines, but found that an unsatisfactory long–term solution. He then bought the Starbuck Electric Power Company and ran a line the dozen or so miles between those two towns. But the current proved too weak to run the irrigation pumps or to electrify the town.

Bryan selected a remote place because he wanted a peaceful setting. But The Riviera proved too isolated for all but a few families. Residents had to transport supplies to Ridpath Station, on the opposite shore, then ferry them across the Snake. With the outbreak of World War I, Bryan's dream collapsed, and the remaining residents left to work in lucrative wartime industries. [14]

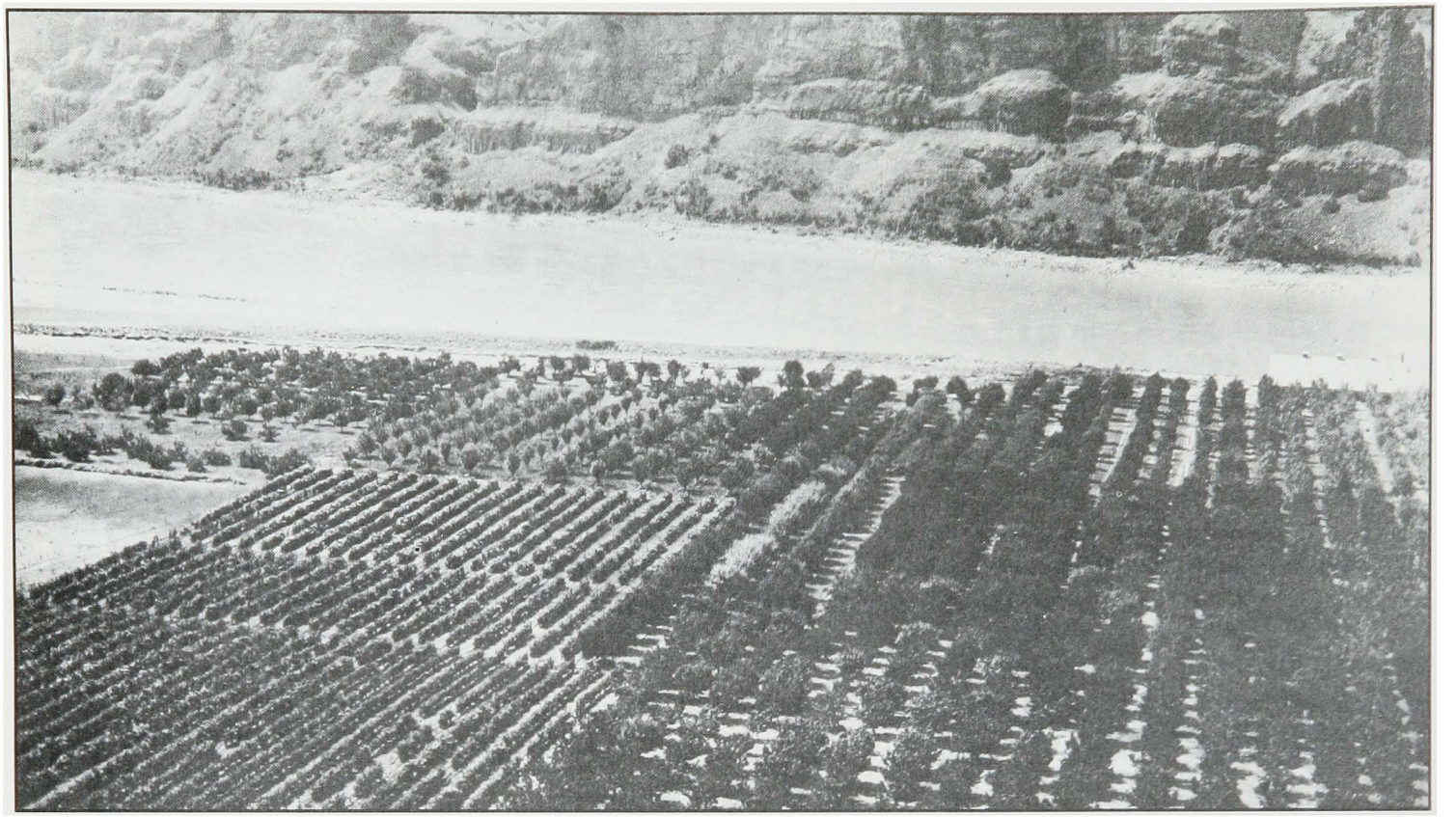
Enoch A. Bryan

But Bryan's name is still pegged to that part of the country, thanks to the tireless efforts of a United States congresswoman.

"Riviera is on the cattle ranch which my parents have rented for the past eighteen years," Washington State University student Jackie Harting wrote Representative Catherine May in 1961. "I first became interested in it when I reported about the past of this little ghost town . . . for a high school history class. . . . I think it would be fitting to name something about this federal dam, probably the pool, in honor of Dr. Bryan." [15]

The letter intrigued May, congressional representative for eastern Washington. But she discovered that naming a reservoir is no easy task. Create a lake and many people usually come forward to provide appellations. The Corps of Engineers suggested naming all the lower Snake reservoirs after regional Indian tribes; Lewis and Clark loyalists wanted each named for a member of the Corps of Discovery; and longtime residents hoped to honor pioneers. The Inland Empire Waterways Association thought the reservoirs should recognize those who died at the Whitman massacre. "We had top level discussions for days on how to handle this sort of thing . . . where more than one name is suggested," one of May's staffers wrote confidentially. "This was discussed with the Corps of Engineers and they don't want to get involved in any controversy either!" [16]

May liked the sound of Lake Bryan and introduced legislation repeatedly in the 1960s requesting this name for the reservoir. She grew frustrated. "The Chairman of the Flood Control Sub–Committee . . . felt the entire omnibus rivers and harbors . . . bill a few years ago was jeopardized . . . when a controversy arose over the section of the bill calling for the naming of a number of projects," she wrote a constituent in 1968. "Ever since then he has refused to include a section in the bill to name projects." [17]



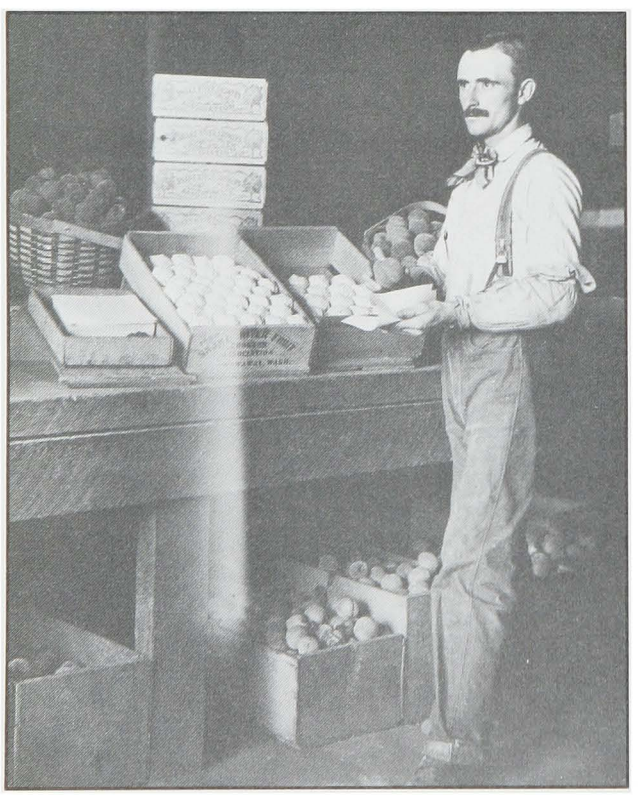
Fruit grew abundantly on the bottom lands along the lower Snake River before reservoirs, such as at Bishops Bar.

Grape harvest in Clarkston around turn of the century.

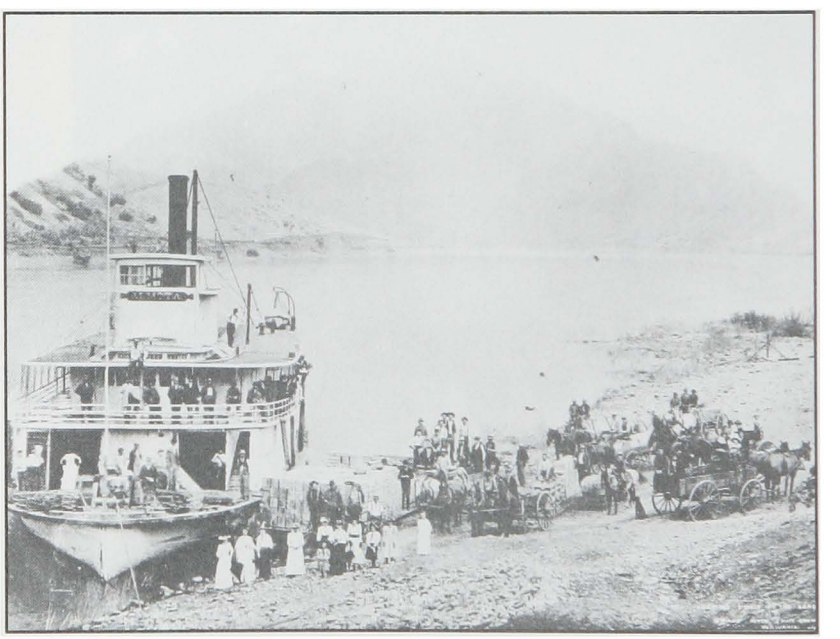
Gathering plums at the Van Arsdol place in Clarkston.

Snake River packing house of the Bishop Brothers.

Several packing houses and canneries processed the famous fruit crop of the lower Snake in the late 1800s and early 1900s.

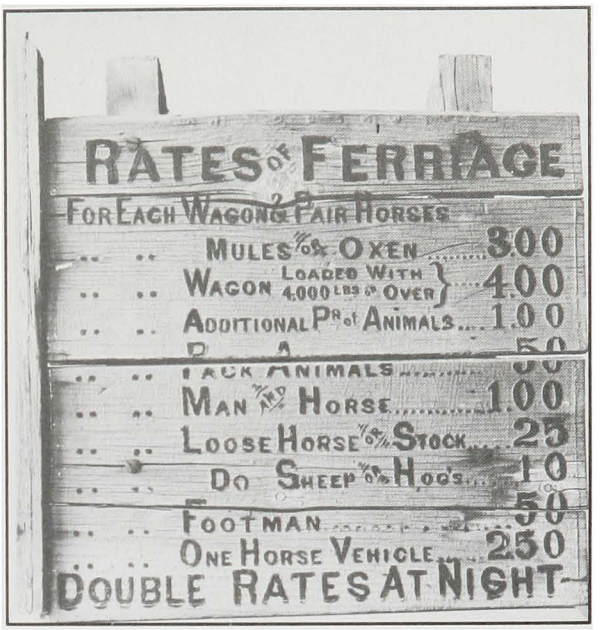


Snake River Fruit Growers Association packing plant at Wawawai.



Steamers -- like this one loading at Wawawai -- carried lower Snake fruit to market down the river.

Ferries provided transportation across the lower Snake prior to bridge construction.



Lower Snake River ferry rates.

Her perseverance triumphed. After nearly a decade of struggle, the waters behind Little Goose officially became Lake Bryan. Enoch A. Bryan probably would have been pleased. But he would have been more interested to learn about artesian wells later discovered at the site of his utopian community. When the Corps of Engineers bored exploratory cores they struck the wells, shooting water high into the sky. Had Enoch Bryan known about those wells his venture might have succeeded. He would not have needed power to pump water uphill from the Snake River. The fruit trees could have thrived and maybe--just maybe--settlers would have come and stayed and lived the idyllic life he had contemplated. [18]

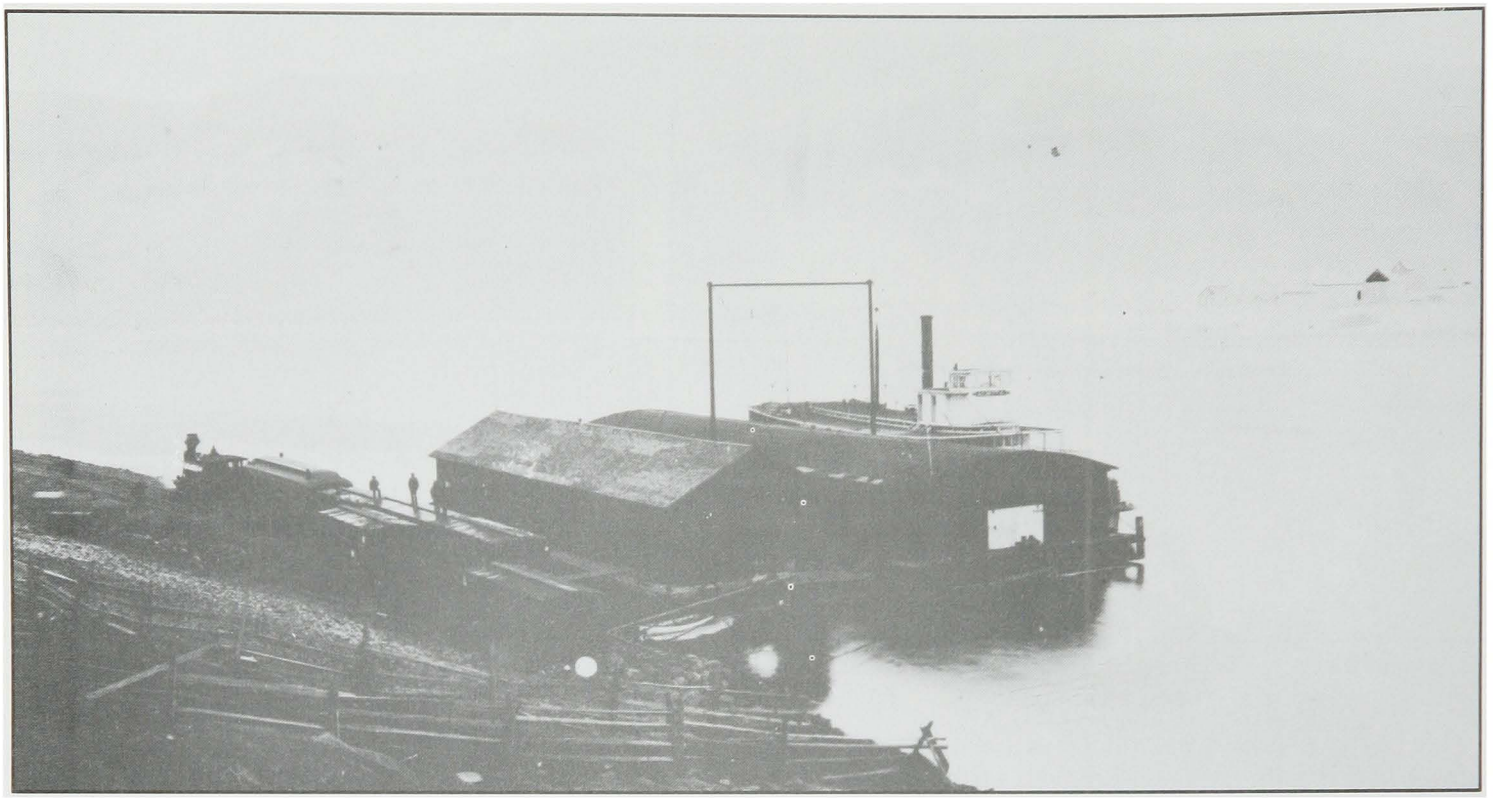
Upstream from The Riviera a string of river communities thrived, situated below the rich agricultural lands where farmers depended upon riverboat connections. Downstream, only a few places warranted the name "town." One of those was Riparia. [19]

Lewis and Clark camped at Riparia before navigating Texas Rapids, a treacherous passage where rocks "appeared to be in every direction." About 60 years later, an enterprising businessmen named Tom Bolen constructed a ferry to complete a link on the Texas Road, providing access between the Walla Walla and Palouse districts. Bolen appropriately named his place Texas Ferry, after the road and rapids. Later residents changed it to Texas City.

In 1881, the Oregon Railway & Navigation Company extended its Walla Walla–Wallula route up the Snake River, terminating on the south shore opposite Texas City. People then referred to the communities on the river's two banks as a single town, either Texas City or Riparia, eventually giving preference to the latter.

After 1881, Riparia became an important point for transferring people and supplies from boat to train. For nearly three decades all transportation upstream from this spot was by steamboat, while the railroad virtually eliminated Snake River steamer traffic downstream.

In 1889, the Oregon Railway & Navigation Company connected rich agricultural lands on the north and south sides of the river with a bridge. Riparia then became an even more prominent junction, boasting as many as 100 residents clustered around a store, three saloons, a restaurant, hotel, and post office.



Steamer and train at Riparia.

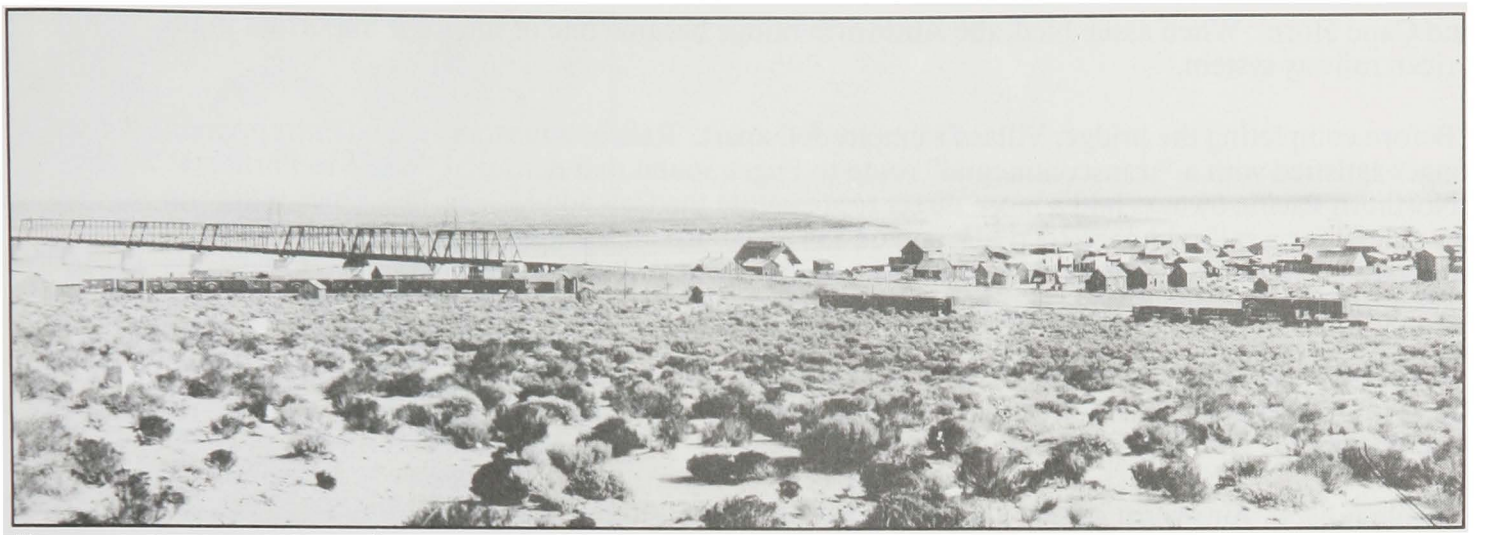
W.H. Stewart thought he detected another boom coming in 1908, and constructed the Stewart Hotel, a stately two–story structure with marble columns. The occasion: another railroad connection. The Camas Prairie Railroad linked Lewiston with Riparia. Now a train came by every hour or two, and the heyday of Snake River steamer travel ended as rails traversed the entire lower river.

But the trains increasingly bypassed Riparia. Rather than an important stopover, it became a way station and Stewart's contemplated boom never materialized. After 1908, Riparia ceased to grow: Population declined even more during the 1930s; and the town died completely in the 1960s as the Corps of Engineers dismantled its remaining buildings, preparing the way for impounded flood waters.

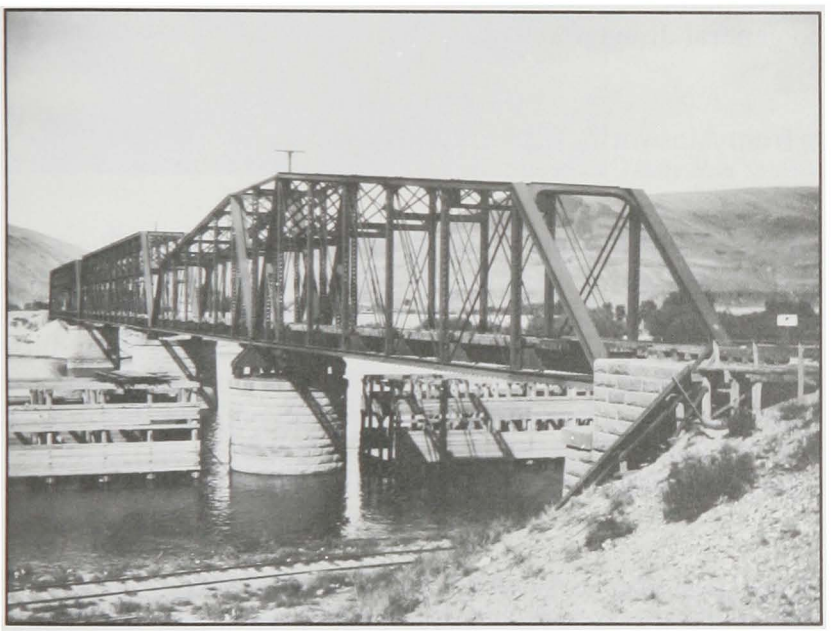
Ainsworth lasted a much shorter time but its fuse burned intensely. Founded in 1879, the town stood on the Snake, about a halfmile upstream from its confluence with the Columbia.

Henry Villard, president of the Northern Pacific Railroad, predicted that "some day a great city will rise" at the junction of the Columbia and Snake rivers. A few years later, a community of nearly 1,000 blossomed, and the *New York Sun* sent out a reporter. It was a town all right, but not exactly a "great city." Ainsworth, the reporter wrote, is "an unthrifty collection of unpainted shanties, populated largely by bullies, harlots, Chinamen and hogs. ... Streets are a mixture of dust and sand ankle deep, except where they are paved with broken whiskey bottles and old playing cards." A short while later the town lay nearly empty. Few communities rose faster or descended more rapidly. [20]

German–born financier Villard had gained control of both the Oregon Railway & Navigation Company and the Northern Pacific by 1880. He was one of the most influential tycoons of his age, and had his empire not collapsed in 1884, Ainsworth might have become the substantial town he predicted.



The construction camp at Ainsworth gained a reputation as one of the Northwest's wildest towns.



The bridge at Riparia. The bridge was later removed by the Corps of Engineers to make way for rising reservior levels.

Under his leadership, Northern Pacific crews laid track west through the Dakota plains while Oregon Railway & Navigation teams worked their way east. They met in Montana in 1883, creating the first transcontinental rail service to the Pacific Northwest. But it was not the transcontinental line Northwest boosters had long dreamed about. Passengers heading from Minnesota to Puget Sound had to travel on the Oregon Railway & Navigation down the Columbia, disembarking twice to shuttle on ferries before going north again to the sound.

Shortly after Oregon Railway & Navigation crews began working their way east, another group of laborers started the first bridge across the lower Snake to connect with the Oregon Railway & Navigation's Spokane branch. Workers began the great Ainsworth bridge in 1882 and completed it two years later at a cost of more than $1 million. Stone cutters from St. Paul quarried its pier rocks at Granite Point on the Snake and shipped them down the river. Simultaneously, an iron superstructure fabricated in the East arrived via boat

around Cape Horn. When assembled, the Ainsworth bridge became one of the most important in the American railway system.

Before completing the bridge, Villard's empire fell apart. Railroad passengers and entrepreneurs were no longer satisfied with a "transcontinental" route to Puget Sound that detoured people to Portland. So the new Northern Pacific owners laid a more direct route across the Cascade Mountains. Once there was no longer a need for a railroad construction camp on the Snake River, workers transported machine shops, storage yards, and other Northern Pacific facilities to the present site of Pasco on the Columbia. Saloon operators and other business owners followed, virtually abandoning Ainsworth.

Ainsworth served briefly as the first seat of newly created Franklin County, but soon Pasco captured that honor. The 1890 census did not list Ainsworth, and while a few buildings stood into the 20th century, the town really died with the completion of its famous bridge.

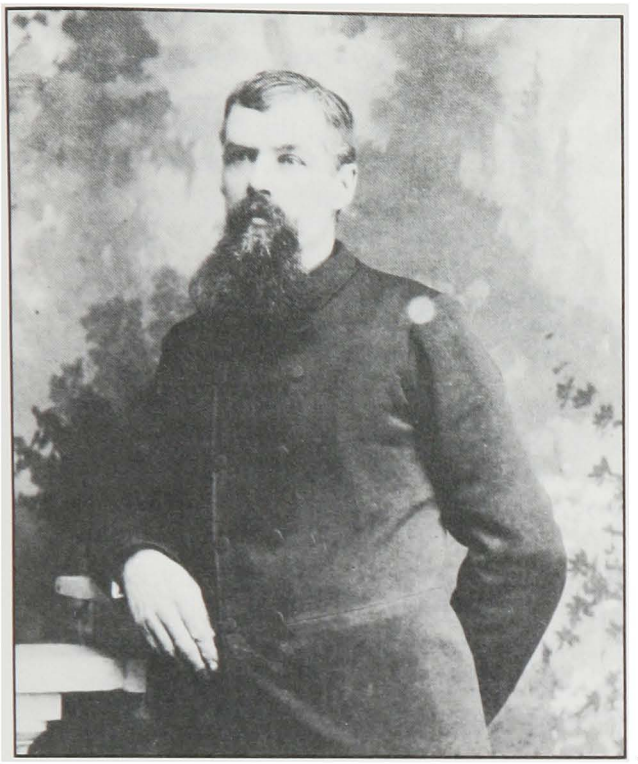
While it lived, Ainsworth gained a reputation as one of the wildest communities in the West. Army Engineer Thomas Symons described it as "one of the most uncomfortable, abominable places in America." A newspaper reporter stated Ainsworth could "boast of few of the best people, the largest number of bad men and women, and the greatest amount of sin, dust, and general disagreeableness, of any place of its size on the coast." [21]

Several small communities blossomed upstream from Ainsworth, Riparia, and The Riviera. Almota was one of the more important.

Almota sat at the northernmost point of the Snake River, near some of the easiest grades to the rich prairie lands above. Consequently, the town became the principal shipping point along the lower Snake. From here, the first load of Inland Empire wheat went downstream to Portland in 1876. As settlers swarmed the Palouse country to take up farming in the 1870s, Almota boomed by catering to the onrush. Soon it boasted two stores, two hotels, a saloon, warehouses, a mill, blacksmith shop, livery stable, shoe shop, and school. Henry Hart Spalding, son of missionaries Henry and Eliza, moved to Almota in 1872, where he acquired over 1,200 acres. He later started a stage line to carry settlers up the hill and hired his brother-in-law, Felix Warren, to operate it. It was the beginning of a colorful career: Felix Warren became one of the famed stage drivers of the West. [22]

Though Warren eventually prospered, he did not get rich on the Almota run. That town's days as an important stage and steamboat station ended when the railroad came. Henry Spalding lived to see its demise. He died in 1898, after trying to save items during a fire at his Almota hotel. His death marked the end of the lower Snake's pioneer period, and people recognized the significance of his passing. "Six hundred followed all that was mortal of a brave and honorable man to his last resting place," reported an observer. "Many towns and cities of Eastern Washington were represented by prominent citizens." Twelve pall bearers carried Spalding's body to a high hill above the town, where it still rests. A few people remained at Almota but now its principal fame came from growing fruit, a reputation it held until laborers removed the orchards to make way for slackwater in the 1960s and 1970s. [23]

None of these river towns ever boomed for an extended period, although boosters liked to brag that their town would surely be an important riverside metropolis one day. Few of the river villages had more than 100 residents. Although most continued to exist into the 1960s, only three Snake River communities survived the arrival of slackwater.



Henry Hart Spalding

Lewiston began as an illegal intrusion onto Nez Perce lands. The noisy tent city supplied miners and served as Idaho's first territorial capital. Some thought it would fade away when southern Idaho culprits hijacked the territorial records in 1863, moving them to Boise. As late as 1878, a San Francisco reporter wrote about Lewiston, "There is no reason for it, except the want of pride in most of the business people, who make money here and spend it elsewhere." If it was only pride that kept the community going, it was a fierce pride, for Lewiston became northern Idaho's largest city. The Army Corps of Engineers did not consider relocating one of Idaho's largest towns when it built its dams. Instead, it constructed an intricate levee system to protect it from rising waters. With completion of that slackwater, Lewiston's stature grew as Idaho's only seaport. [24]

Clarkston, Washington, more than 30 years younger than Lewiston, never caught up with its sister city in population. But it has long been the second largest city along the lower Snake.

Charles Francis Adams was the most famous character associated with Clarkston: Boston capitalist, president of the Union Pacific Railroad, and descendant of Presidents John and John Quincy Adams. But C.C. Van Arsdol, a railroad engineer who later helped design the famous spiral highway leading from Lewiston to the Palouse country, became the town's real hero. Before Van Arsdol looked across the Snake River from Lewiston to the broad, fertile benchland on the opposite shore, others had contemplated irrigating that place. A few had even settled there, one as early as 1862. [25]

But Van Arsdol had the engineering ability to do more than dream of irrigation, and he had connections with Adams through former days working with the railroad. Adams' financial backing and Van Arsdol's skill provided the missing link in the long quest for irrigation. Adams, Van Arsdol, and others incorporated the Lewiston Water and Power Company in 1895, dug an irrigation ditch from Asotin Creek to the flatlands in 1896, platted a town, and began selling land for $100 an acre. They called the place Vineland, a name that changed briefly to Concord, and then to Lewiston. At the turn of the century, Washington legislators permanently changed its name to Clarkston to avoid confusion with its Idaho neighbor.

No matter what its name, Clarkston's land proved productive, attracting settlers. Within a few months the community had nearly a dozen businesses and Clarkston steadily grew.

Although Clarkston became the biggest community in Asotin County, it appeared too late to compete for the county seat. Two small towns had earlier fought for that distinction. In 1882, two villages formed upstream from Lewiston on the Washington side of the Snake: the Town of Asotin and Assotin City. The Washington legislature, a proper group of men, later changed the spelling of the latter to Asotin. [26]

Businesses started in both communities and the townspeople of each petitioned for a new county. The territorial legislature carved Asotin County out of Garfield, but refused to say which town should become the seat, noting only that county headquarters should be located in one or the other. This touched off a bidding war with each community's residents offering inducements. The Town of Asotin, which provided an office building, treasurer, and auditor free of charge, made the best offer, winning the contest. Facing the inevitable, all Asotin City businesses moved to the Town of Asotin.

Most of the people who lived along the lower Snake, whether in Lewiston, Almota, Riparia, or elsewhere, shared one idea. They believed the river offered the key to regional growth. People who could master this river, remove its rapids, provide year–round navigation, would open a lifeline. Create an open river to the sea, and the Inland Empire would prosper. The lush interior farmlands could become the world's wheat basket. And those who controlled that trade, who could economically ship this abundance to market, would get rich. An open river could supply that need. It appeared that simple. But the dream took 100 years of work.

Endnotes

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[1] The story of Pierce and Idaho's first gold discovery has been well documented. This account is taken from the following sources: J. Gary Williams and Ronald W. Stark, eds., *The Pierce Chronicle: Personal Reminiscences of E.D. Pierce as Transcribed by Lou A. Larrick* (Moscow: Idaho Research Foundation, 1975); Ralph Burcham, "Reminiscences of E.D. Pierce, Discoverer of Gold in Idaho" (unpublished Ph.D. dissertation, Washington State College, 1958); Alvin M. Josephy, Jr., *The Nez Perce Indians and the Opening of the Northwest* (New Haven: Yale University Press, 1965), pp. 386–442; Merle Wells, *Rush to Idaho*, Bulletin #19 (Moscow: Idaho Bureau of Mines and Geology, 1963); and William J. Trimble, *Mining Advance into the Inland Empire*, Bulletin #638 (Madison: University of Wisconsin, 1914).

[2] The quotation is from Pierce, *Chronicle*, p. 79.

[3] Quotation, Ibid., p. 80.

[4] The quotation is from Josephy, *The Nez Perce*, p. 429.

[5] For statistics on the numbers of miners entering the region see Johansen and Gates, *Empire of the Columbia,* p. 267. Unless otherwise noted, the following description of early navigation on the lower Snake is taken from the following: Mills, *Stern–Wheelers up Columbia*, esp. pp. 40–3, 80–3; Fritz Timmen, *Blow for the Landing: A Hundred Years of Steam Navigation on the Waters of the West* (Caldwell, ID.: Caxton Printers, 1973), esp. pp. 2–21, 141–2; Fred W. Wilson and Earle K. Stewart, *Steamboat Days on the Rivers* (Portland: Oregon Historical Society, 1969), esp. pp. 2–10, 59–60, 84–7; Carole Simon–Smolinski, *Clearwater Steam, Steel, & Spirit* (Clarkston, WA.: Northwest Historical Consultants, 1984); Bill Gulick, *Snake River Country* (Caldwell, ID.: Caxton Printers, 1972), pp. 136–43; Henry Miller, "Letters From the Upper Columbia," *Idaho Yesterdays*, 4:4 (Winter 1960–61), pp. 14–25; Lulu Donnell Crandall, "The Colonel Wright," *Washington Historical Quarterly*, 7:2 (Apr. 1916), pp. 126–32; and John E. Akins, "History of Steamboat Navigation on Snake River," typescript, 1927, Cage 1599, WSU MASC. *The Colfax Gazette*, 21 Mar. 1957, carried an excellent series of articles on early Snake River navigation. For a fine descriptive account of steamer travel up the river to Lewiston see Simon–Smolinski, Journal 1862: *Timothy Nolan's 1862 Account of His Riverboat and Overland Journey to the Salmon River Mines, Washington Territory* (Clarkston, WA.: Northwest Historical Consultants, 1983). Simon–Smolinski's account is fictionalized, but is based on original research in first–person accounts and includes an excellent list of sources for those interested in additional information on this subject.

[6] The quotation is from Miller, "Letters from Upper Columbia," p. 16. Also see Simon–Smolinski, *Journal* 1862 for good details on the luxurious early steamers.

[7] Miller, "Letters From Upper Columbia," p. 17.

[8] The quotation is in Merle Wells, "Steamboat Down the Snake: The Early Story of the 'Shoshone'," *Idaho Yesterdays*, 5:4 (Winter 1961–62), p. 23.

[9] Ibid., pp. 24–5; Mills, *Stern–Wheelers up Columbia*, pp. 81, 84. For a first–hand account of the *Colonel Wright's* trip up the canyon see Fred Lockley, ed., "Reminiscences of Captain William Polk Gray," *Oregon Historical Quarterly*, 14:4 (December 1913), pp. 321–54.

[10] For cattle raising in the region see J. Orin Oliphant, *On the Cattle Ranges of the Oregon Country* (Seattle: University of Washington Press, 1968); Oliphant, "Winter Losses of Cattle in the Oregon Country, 1847–1890," *Washington Historical Quarterly*, 23:1 (January 1932), pp. 3–17; Meinig, *The Great Columbia Plain*, pp. 220–23; Marjorie Hales, "The History of Pasco, Washington, to 1915" (unpublished masters thesis, Washington State University, 1964), pp. 19–20; and Alexander Campbell McGregor, *Counting Sheep: From Open Range to Agribusiness on the Columbia Plateau* (Seattle: University of Washington Press, 1982).

[11] For some of the better sources on the agricultural development of the region see Meinig, *Great Columbia Plain;* Keith R. Williams, "The Agricultural History of Latah County and the Palouse: An Overview and Three Case Studies" (unpublished Masters thesis, Washington State University, 1984); Kirby Brumfield, *This Was Wheat Farming: A Pictorial History of the Farms and Farmers of the Northwest Who Grew the Nation's Bread* (Seattle: Superior Publishing Co., 1968); Thomas B. Keith, *The Horse Interlude: A Pictorial History of Horse and Man in the Inland Northwest* (Moscow: University Press of Idaho, 1980); Selma Yocom, "History of Crops in the Palouse, 1880–1930," unpublished research report in Rural Life in the Palouse, Binder 2, LCHS; Philip R.P. Coelho and Katherine H. Daigle, "The Effects of Developments in Transportation on the Settlement of the Inland Empire," *Agricultural History*, 56:1 (January 1982), pp. 22–36; Frank Gilbert, *Historic Sketches of Walla Walla, Whitman, Columbia, and Garfield Counties, Washington Territory* . . . (Portland: A.G. Walling, 1882); and *An Illustrated History of North Idaho* (Chicago: Western Publishers, Inc., 1903). In addition, many of the local historical societies of the region publish journals that regularly carry invaluable information about the area's agricultural history. For the better of these see *Latah Legacy* (Latah County Historical Society); *Bunchgrass Historian* (Whitman County Historical Society); *Nez Perce County Historical Society Journal*; and *Franklin Flyer* (Franklin County Historical Society).

[12] Information for this discussion of transporting wheat down the Snake canyon by various means comes from June Crithfield, *Of Yesterday and the River* (Self–published, 1964); Arthur Earl Victor, "The May View Tramway," *The Pacific Northwesterner*, 9:3 (Summer 1965), pp. 33–47; Norma Gimlin, "May View Tramway Tragedy," *The Record*, 34 (1973), pp. 61–5; Keith C. Petersen and Mary E. Reed, "Tramways," *Latah Legacy*, the Quarterly Journal of the Latah County Historical Society, 14:2 (Summer 1985), pp. 21–4; Glen Lindeman and Matthew Root, "The Interior Grain Tramway," *Bunchgrass Historian*, 16:3 (Fall 1988), pp. 3–11; Lindeman, "Canyon Grain Bin and Chutes," *Bunchgrass Historian*, 16:4 (Winter 1988), pp. 3–8; and George M. Gage, "The Bucket Tramway," *Pacific Monthly*, 12:3 (Sept. 1904), pp. 149–50. For more technical detail on the workings of tramways see the David Stearns papers, Cage 4148, WSU MASC.

[13] For excellent descriptions of the international grain trade of the 19th century and its impact on Inland Empire farmers see Donald W. Meinig, "Wheat Sacks Out to Sea," *Pacific Northwest Quarterly*, 45:1 (January 1954), pp. 13–18; and Mills, *Stern–Wheelers up Columbia*, pp. 99–113. For the first shipment and development of the lower Snake wheat fleet see *An Illustrated History of Whitman County*, State of Washington (W.H. Lever, 1901), p. 105; and typescript of speech delivered by June Crithfield, 9 Jy. 1967, Cage 1820, WSU MASC.

[14] For The Riviera see *Moscow Daily Idahonian*, 22 Dec. 1990; *Spokane Spokesman–Review Magazine*, 22 Aug. 1965; David H. Stratton and Glen W. Lindeman, *A Cultural Resources Survey for the United States Army Corps of Engineers*, Walla Walla District, Project Report 28 (Pullman: Washington Archaeological Research Center, 1976), pp. 68–9; and C. Clement French, president, Washington State University, to Catherine May, 6 Je. 1961, box 38, May papers.

[15] Harting to May, 4 Apr. 1961, box 38, May papers.

[16] Inter–office memo, "Ruby to HH," box 45, May papers.

[17] For the quotation see May to George Gannon, Mabton, Wa., 11 July 1968, box 272. For additional background on the long struggle to name the reservoir see May to E.G. Patterson, Director of Alumni Relations, WSU, 23 June 1963, box 161; and May to Gannon, 14 Sept. 1964, box 38. All in May papers.

[18] For the core drillings see *Spokane Spokesman–Review Magazine*, 22 Aug. 1965.

[19] For the history of Riparia see Caroline D. Carley and Robert Lee Sappington, *Archaeological Test Excavations of the Historic Component of 45–WT–1, Texas City/Riparia, Whitman County, Washington, 1983,* Anthropological Research Manuscript Series #77 (Moscow: University of Idaho Laboratory of Anthropology, 1984); Charles E. Ray, "Memoirs or Reminiscences," *Bunchgrass Historian*, 15:4 (Winter 1987), pp. 13–16; "Riparia and Texas Ferry," *Bunchgrass Historian*, 5:1 (Spring 1977), p. 3; Gilbert, *Historic Sketches*, p. 416; *An Illustrated History of Whitman County*, p. 228; and Stratton and Lindeman, *A Cultural Resources Survey,* pp. 65–6.

[20] The Villard quotation is from Ted Van Arsdol, "Richland Diversification," unpublished typescript, 1962, Cage 117, Van Arsdol papers, WSU MASC. The *Sun* quotation is in Van Arsdol, "End of Track Town," *Frontier Times*, 35:2 (Spring 1961), pp. 28–9, 63. For additional information on Ainsworth see Hales, "The History of Pasco, Washington," esp. pp. 21–40; Walter A. Oberst, *Railroads, Reclamation and the River: A History of Pasco* (Pasco: Franklin County Historical Society, 1978), esp. pp. 15–17; Stratton and Lindeman, *A Cultural Resources Survey*, pp. 44–7; and Meinig, *Great Columbia Plain,* pp. 257–69.

[21] The first quotation is in Stratton and Lindeman, *A Cultural Resources Survey*. p. 44. The second is in Meinig, *Great Columbia Plain*, p. 258.

[22] For Almota see Elliott Gay, *Yesterday and Day Before* (Self published, 1975); Joseph W. Hungate, "Long Ago Days Recalled," *Bunchgrass Historian*, 5:1 (Spring 1977), pp. 14–16; Reminiscences of Mary G. Spalding, in William S. Lewis, "Reminiscences of Pioneers of the Inland Empire," typescript, 1926, pp. 171–76, Acc. #82–211, E. T. Beecher papers, EWU; Stratton and Lindeman, *A Cultural Resources Survey*, pp. 70–2; Gilbert, Historic Sketches, pp. 445–6; and *An Illustrated History of Whitman County*, pp. 226–7, 245, 361. For Warren see Jerome Peltier, Felix Warren: *Pioneer Stage Driver* (Fairfield, WA.: Ye Galleon Press, 1988).

[23] The quotation is in Gay, *Yesterday and Day Before*, p. 80.

[24] For Lewiston see Gene Mueller, *Lewiston: A Pictorial History* (Lewiston: Chamber of Commerce, 1986); and Margaret Day Allen, *Lewiston Country: An Armchair History* (Lewiston: Nez Perce County Historical Society, 1990). The quotation from the *San Francisco Bulletin* is in Ted Van Arsdol, "Richland Diversification," typescript, 1962, Cage 117. Van Arsdol papers, WSU MASC.

[25] For summaries of Clarkston history see Elgin V. Kuykendall, *Historic Glimpses of Asotin County, Washington* (Self published, 1954), pp. 50–51; and Ted Van Arsdol, "Brief History of Jawbone Flat and Early Clarkston," typescript, n.d., Cage 117, Ted Van Arsdol papers, WSU MASC. The papers of the Lewiston–Clarkston Improvement Company, which provide excellent detail on the founding and development of Clarkston, are also available at WSU MASC.

[26] For Asotin, see Kuykendall, *Historic Glimpses of Asotin County*, pp. 32–3.7

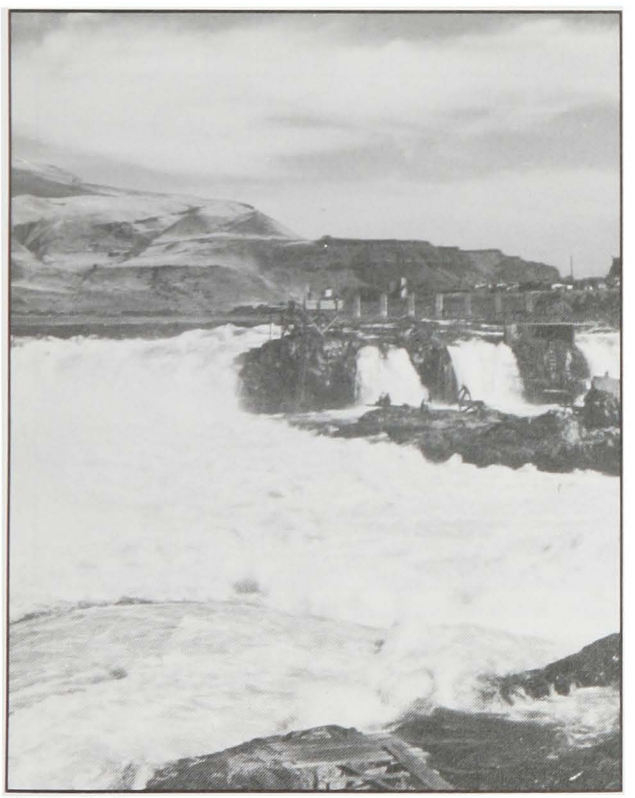
Chapter 5
An Open River

Had they contemplated the protracted construction of Cascade Locks, promoters might have had some inkling of how long it would take to complete an open river all the way from Lewiston to the Pacific.

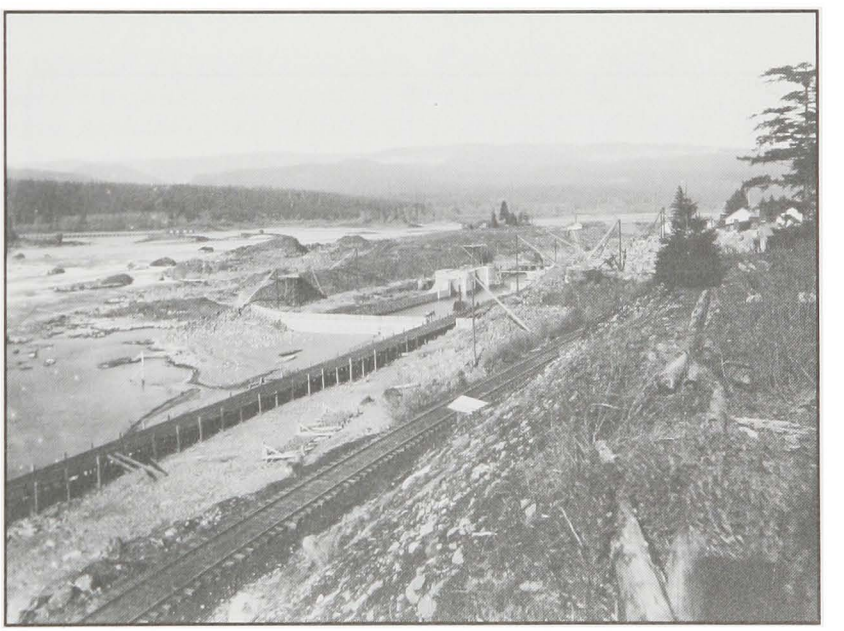
The boiling rapids at the Cascades of the Columbia, downstream from The Dalles, halted navigation. Entrepreneurs countered white water with imagination: they ran mule trains along the river banks, and for 75 cents per hundred pounds, portaged emigrants' effects around the falls. Eventually the Oregon Steam Navigation Company took over, replacing mules with a small locomotive, the first in Oregon.

The detour accomplished its task but consumed a lot of time, and dreamers envisioned a day when boats would steam through the Cascades. In 1876, Congress authorized the U.S. Army Corps of Engineers to construct a canal to accomplish that goal. Two decades later they were still working. But, when opened in 1896, the locks proved effective. Boats slipped by the rapids, carrying thousands of tons of material. In order to compete with the paddlewheels, railroads lowered rates.

Merchants and farmers saw the value of lobbying for more navigational aids to allow steamers to easily pass all the way to Lewiston. It seemed a no–lose situation: either steamboats would carry their cargo more cheaply than railroads, or railroads would lower rates to beat the competition. The next obvious obstruction to their open river plans was Celilo Falls upstream from The Dalles. [1]



Celilo Falls.



When the Corps of Engineers completed Cascade Locks on the Columbia, open river advocates wanted them to continue with navigational aids up the Columbia and Snake to Lewiston.

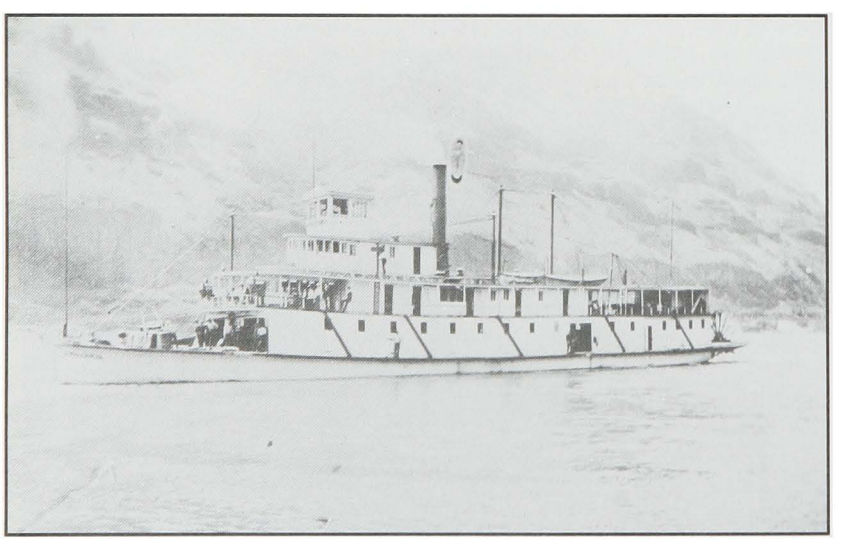
An Open River Association formed in Portland. Working with wheat growers in the interior, it pressured Congress for a canal through the eight miles of river that foamed through Celilo's boulders. Congress responded by authorizing the Corps of Engineers to construct a passageway. The result was an impressive concrete and stone canal and a series of locks sixty–five feet wide and eight miles long, completed in 1915. [2]

Northwesterners celebrated in a manner appropriate for marking a destiny–changing event. A dozen river towns, all expecting to become prosperous ports, observed the occasion with "Open River" commemorations. There were speeches and parades, baseball games and fireworks, carnivals and banquets. A boatload of dignitaries, commencing their excursion at Lewiston, celebrated all the way to Astoria.

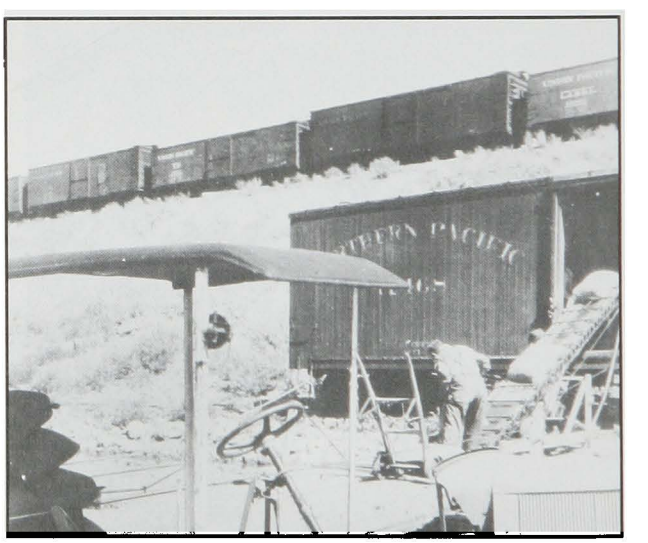
Their oratory brimmed with optimistic predictions for the inland Northwest. "Civilization may well make here its most splendid achievements," prophesied Marshall Dana, one of the canal's staunchest supporters. Joseph N. Teal, another open river stalwart, seconded that opinion: "The Inland Empire will be an empire in fact as well as in name––an empire of industry, of commerce, of manufacture and agriculture; and the valleys of the Columbia and the Snake will have become one vast garden, full of happy homes and contented and industrious people." [3]

It did not take long for the splendid dream to shatter. Hardly had the canal opened when Columbia and Snake river steamboating collapsed. In hindsight, the reason seems obvious.

Sternwheelers could not compete with the speed, efficiency, and greater carrying capacity of trains. The boats had no hope of seriously threatening railroad dominance once tracks crossed into the wheat regions. Railroads hastened their demise by lowering rates, and steamers lost freight trade. A network of highways added to the competition, and steamboat operators found it difficult even to lure passenger travel. By 1919, the new locks at Celilo, opened with such fanfare, lay virtually idle. There was no commerce at all through the canal from 1921 to 1930. [4]



Steamer Lewiston *on lower Snake. Once railroads built along the Snake, they took shopping business from the steamers and the sternwheeler era came to an end.*



Loading wheat onto rail cars at Wawawai.

With the glory days of the great wheat fleets over and railroads taking grain to market, it appeared to some pessimists that the Columbia/Snake river system would never become a major navigational way. But there were others who continued to dream. Open rivers had brought prosperity elsewhere; they could do the same here. The long battle for a year–round navigable water course from Lewiston to the Pacific had really just begun.

Pacific Northwesterners did not invent the concept of open rivers. Egyptians built canals 4,000 years before the birth of Christ. The Erie Canal of the 1820s touched off an interest in inland navigation in the United States. The federal government became involved in 1824 with the first in a series of Congressional acts aimed at improving navigation. Soon several canals linked the eastern United States with a system of navigable inland waterways. [5]

But by the 1870s, as railroads connected the east and west coasts, steamboat operators had difficulty competing with trains' low freight rates. However, as railroads began to dominate shipping they raised charges, and residents of inland areas clamored for relief. Increased competition appeared to be the best method of lowering rates, and in those years only a developed waterway system could furnish competition to railroads. Improvements in marine technology, including propellers adaptable to shallow–draft vessels and the development of towboats and barges capable of carrying huge loads, provided the means to contest the railroads.

President Theodore Roosevelt aided the cause of inland navigation by advocating maximum multipurpose development of the nation's rivers. Writing in 1908 he said:

> *Our river systems are better adapted to the needs of the people than those of any other country. . . . Yet the rivers of no other civilized country are so poorly developed, so little used, or play so small a part in the industrial life of the nation as those of the United States. It is poor business to develop a river for navigation in such a way as to prevent its use for power, when by a little foresight it could be made to serve both purposes. We can not afford needlessly to sacrifice power to irrigation, or irrigation to domestic water supply, when by taking thought we may have all three. Every stream should be used to the utmost.* [6]

The Army Corps of Engineers at this time did not agree with the President. At the turn of the century, the Corps advocated that rivers' primary purpose should be navigation. Among members of Roosevelt's Inland Waterways Commission, only the Corps' representative dissented from the President's multipurpose views that claimed other river uses were equally important.

General George Washington had launched the predecessor of the Corps in 1775, when he appointed Colonel Richard Gridley chief engineer of the Continental Army, a position Congress authorized. The selection of Gridley was unusual because most 18th century engineers in America came from France. To remedy this situation, Congress established the Corps of Engineers in 1802 and also started the United States Military Academy at West Point. It was America's first engineering school, and the Corps administered it.

In 1824, Congress directed the Corps to clear snags from the Ohio and Mississippi rivers. The Corps also received comprehensive surveying authority from the General Survey Act. The Army Engineers were now involved in a wide array of civil works functions, including clearing rivers; constructing lighthouses, public

buildings, monuments, and bridges; exploring and mapping the West; and surveying and planning canals, roads, and railways. The Corps concentrated its power, though, in programs to improve harbors and provide navigation on the nation's rivers. [7]

By the mid–19th century the Corps of Engineers dominated federal water programs. But when it became involved in flood control it temporarily lost some of its power.

In 1861, Army Engineers Andrew Humphreys and Henry Abbot staked their reputations, and that of their agency, on a monumental study of Mississippi River flooding. Discounting the potential for jetties to remove sediment, and dams and reservoirs to ease flooding, Humphreys and Abbot proposed instead to construct higher levees.

A persistent critic, bridge builder and river pilot James Eads, disagreed. In the 1870s, he constructed small jetties in the delta that washed away sediment, creating a deeper channel less prone to flooding. For the first time the delta was open to ocean–going traffic. Congress began to believe that others, not just members of the Corps, had expertise in waterways development. [8]

While the Corps continued to insist that levees provided the surest flood control solution, Congress began to support water programs of other agencies. It granted increasing authority to Corps' competitors for federal water money: the Mississippi River Commission, the Geological Survey, and most importantly, the Reclamation Service. The Corps responded by opposing multipurpose projects that threatened the dominance of navigation. Consequently, the Corps did not support Theodore Roosevelt's multipurpose plans in 1908.

Significant legislation in the 1920s and 1930s, combined with a new generation of Corps leaders convinced of the rewards of multipurpose development, reinstated the Army Engineers as the nation's leading water resources agency.

The 1925 Rivers and Harbors Act directed the Corps and the Federal Power Commission to estimate the expense of surveying the nation's navigable rivers and make recommendations for improving them. The 1927 Rivers and Harbors Act actually authorized these river surveys, based on estimates the federal agencies had submitted in House Document 308, published in 1926. Known as 308 reports after the House Document number, these studies became basic planning tools for navigation, flood control, irrigation, and hydroelectric power generation. By the mid–1930s, the Corps had prepared more than 200.

The Corps began reaping benefits from its 308 recommendations when Franklin Roosevelt became President. The federal government authorized Bonneville Dam on the Columbia River in 1933. It was one of the Corps' first important multipurpose dams.

The Flood Control Act of 1936, which authorized more than 250 projects, delegated additional work to the Corps. The Engineers launched a major era of dam–building, many constructed in the Pacific Northwest, and most providing multiple benefits. The Corps became the dominant dam construction organization in the United States. [9]

The Corps of Engineers undertook its first Pacific Northwest civil works project in 1866, clearing snags on the Willamette River near Portland. In the 1870s the Engineers made improvements on the lower Columbia, and in the 1880s began constructing jetties at the river's mouth. Completion of the Cascade and Celilo canals

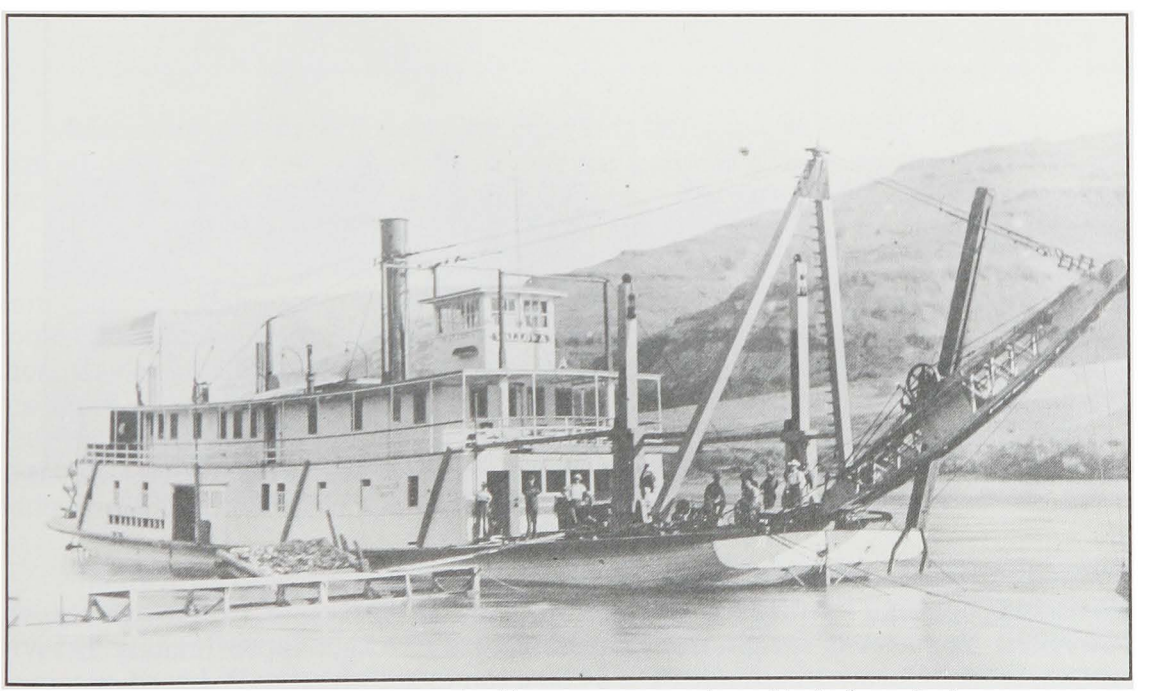
in 1896 and 1915, respectively, solidified the Corps' reputation as the dominant waterways agency along the Columbia. [10]

The canals brought an early version of an open river, permitting transportation all the way from Portland to Lewiston by intrepid pilots in sturdy boats traveling at high water. But the lower Snake remained treacherous. The Corps could build a dozen canals on the Columbia, but until they did something about the rapids of the Snake, Lewiston's port would remain unused most of the year.

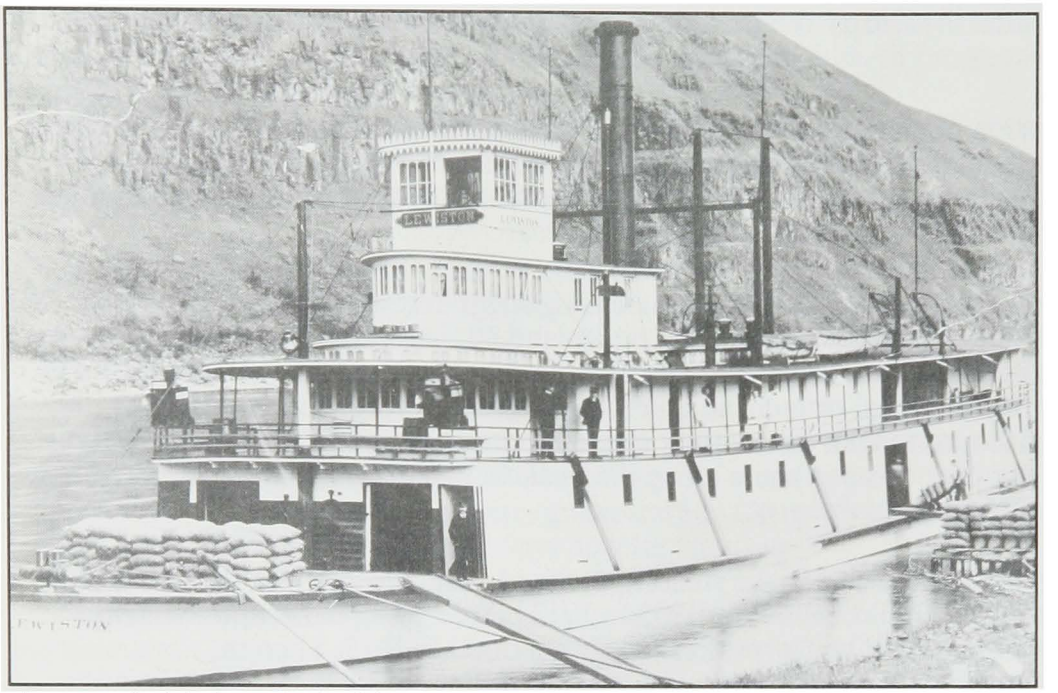
To make that Idaho town more accessible, the Corps began clearing snags and rocks from the lower Snake in the 1880s. They sought to maintain a passageway 5 feet deep and 60 feet wide. They blasted, constructed dikes to force water into the navigation channel, and brought in a government steamer, the *Wallowa*, to dredge and remove debris. But local farmers and merchants wanted more, and in 1907 they pressured the Washington State Legislature to take the unusual step of appropriating $125,000 to the federal government for the Corps to use in creating an open route along the Snake and Columbia rivers. Most of the money went into channel–clearing along the Snake. [11]

Despite these efforts, shipping along the lower Snake steadily declined. The Open River Transportation Company operated between Lewiston and Celilo Falls from 1905 to 1912 before going bankrupt. No river commerce existed on the Snake from then until the Corps finished Celilo canal in 1915. Then the Columbia River Transportation Company operated between Portland and Lewiston during spring high–water months. In 1920, one boat made five round trips between those cities; after that, all shipping on the Snake ceased except short–hauls between railroad stations. [12]

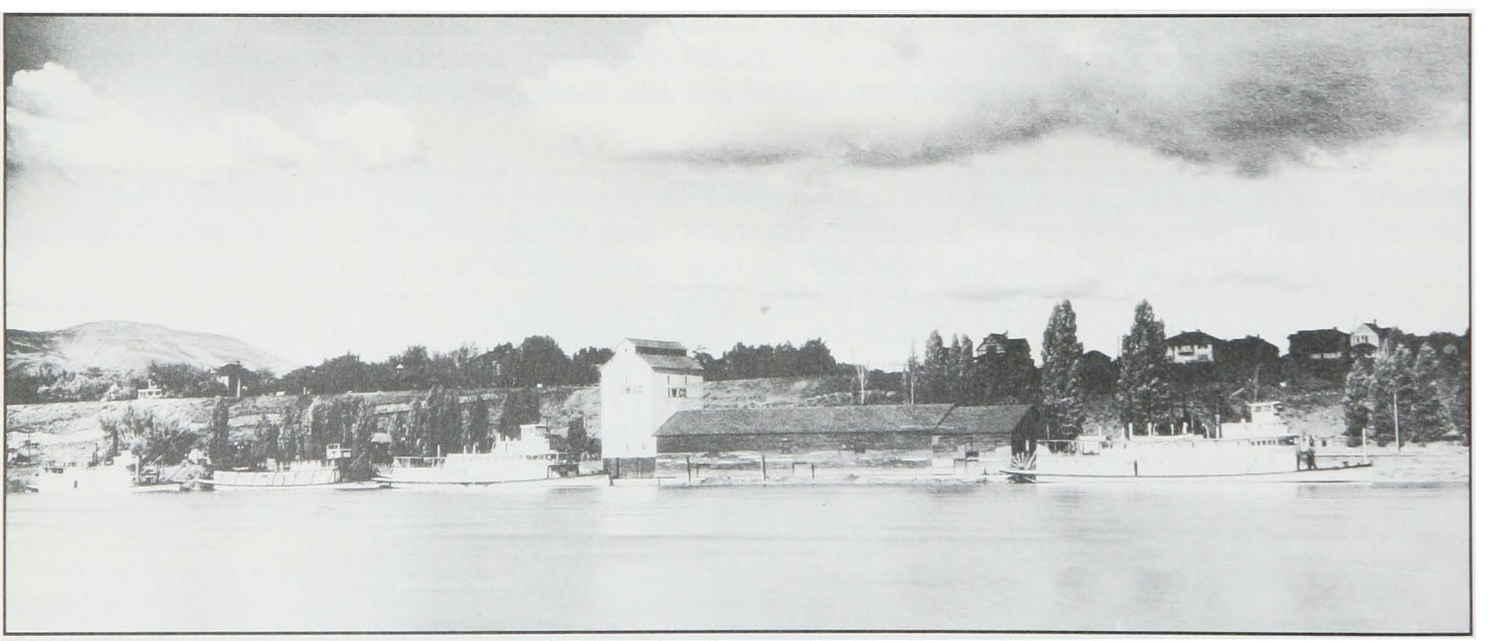
Even when boats could ply the lower Snake, it was usually at the wrong time. Spring was best for navigation, when water ran high. But harvest came in the fall. Railroads increasingly provided the only option for grain growers, and farmers grew disenchanted with that choice as rates rose.



The Corps of Engineers' dredge Wallowa *helped keep a navigation channel in the lower Snake.*



Steamers plied the lower Snake delivering sacks of wheat to Portland, but the river was navigable only part of the year – and at the wrong time. Steamers could most easily make it up the river in the spring. But wheat was ready for shipment in the fall.



Lewiston's port depended upon an open river to facilitate the shipment of wheat to Portland and other materials upriver from Portland.

By the early 1930s, products went by barge for fifty cents a ton from Duluth, Minnesota, to Buffalo, New York, a distance of about 1,000 miles. Boats towed freight from Kansas City to Chicago, approximately 550 miles, for $1.94 per ton. At the same time, farmers paid railroads $4.80 a ton to get wheat to Portland or Seattle, a distance under 400 miles. They declared it unfair for the federal government to assist shippers elsewhere and do so little for the Inland Empire. The lower Snake River provided an artery to the sea. The

government, they argued, needed to recognize that stream's potential and do something to make the river navigable year–round. [13]

"An open river does not mean merely the completion of the Celilo Canal, blowing out a few rocks at the rapids and scraping the gravel off of a few shoals," complained Captain W.P. Gray, longtime pilot of the Columbia and Snake rivers. "It means dams with locks on the Snake . . . to submerge the rapids, reefs and bars." He spoke in 1915, while Celilo was still glossy new. But already river advocates knew it would not be adequate. Over the years they organized into a confusing number of advocacy groups demanding further improvements. [14]

These included the Columbia & Snake River Waterways Association, the Western Inland Waterways Corporation, the Umatilla Rapids Association, the Inland Empire Maritime Conference, the Tri–State League, the Columbia Valley Association, and various others of short life and little influence. The organizations sometimes bickered with each other over priorities. Those based in Portland or along the Columbia wanted the Columbia developed first. Those centered in Lewiston sought improvement of the Snake.

Still, most groups had several objects in common. They sought a series of locks and dams along the Columbia and Snake rivers to create slackwater from Lewiston to Portland. They advocated multipurpose projects that could produce hydroelectricity and aid irrigation, although they viewed these benefits as ancillary to navigation. They organized public opinion to pressure Congress. And they expected that, once Congress authorized river improvements, the Army Corps of Engineers would undertake the task because, as Lewiston's Arthur Ward, a leading open river advocate stated, the Corps was "thoroughly disinterested and completely competent." [15]

But the river advocates were too splintered to be effective. They needed unity and a strong leader. They found those attributes in the Inland Empire Waterways Association and Herbert G. West.

Advocates of river improvements got along fairly well as long as little money was involved. The meager expenditures of the federal government on the Columbia/Snake system united all the river associations behind one goal: the government must substantially increase its funding of the open river project.

But when Franklin Roosevelt became president he added a new dimension that swelled regional animosities. Much sooner than anyone expected, Roosevelt directed the Army Corps of Engineers to construct Bonneville Lock and Dam. There should have been rejoicing among open river supporters, and there was in some quarters, particularly in Portland, because the dam would create work for idle Portland residents, attract tourists, and generate electricity for local markets. But upstream residents, concerned because the Bonneville project called for locks too narrow to allow sea going barges, saw few benefits coming to them. Umatilla business people lobbied for larger locks, as well as immediate authorization of an additional Columbia River dam near their city.

Meanwhile, Lewiston's open river advocates split with their former allies on the mid-Columbia. They saw no reason why Umatilla should get a dam before the lower Snake. "Development on the Columbia River should follow similar development on the lower Snake River —— not precede it," argued the Lewiston-based Western Inland Waterways Corporation. And mid-Columbia groups should not jeopardize future river development by advocating larger Bonneville locks. Expensive locks large enough to accommodate ocean-going vessels —— costing $7 million more than the $32 million the federal government has already set.

aside for Bonneville--could divert money from Snake River improvement. Besides, some powerful eastern Congressmen, who already believed the sparsely populated Pacific Northwest received too much federal money, were sure to revolt when asked for more. "If more millions should now be secured for sealocks at Bonneville it is readily conceivable where the open-river project may end--stranded on the limb of the tree," warned the *Lewiston Morning Tribune*. [16]

Amidst the quarreling, the chambers of commerce of Lewiston, Clarkston, Asotin, and Pomeroy called an open river meeting at Lewiston in February 1934, pledging that delegates would take no official votes on courses of action. This was to be an informational meeting only. More than 300 people arrived, probably the largest open river conference ever held in the region.

The night before the Lewiston session, a group of men from the mid-Columbia area met in Walla Walla and decided to disregard the "no official action" sanction. The next day B.M. Huntington, president of the Walla Walla Chamber of Commerce, rose before the conference, beseeching delegates to approve a seven-point set of principles. Point one requested substitution of seagoing for barge locks at Bonneville. Point two advocated immediate construction of a dam at Umatilla. Only at point three did Huntington address the need for locks and dams on the lower Snake. It was a proposal guaranteed to anger, and it did. The conferees refused to vote. Undeterred, the rebels met the next day in Walla Walla and organized a new advocacy organization that would succeed where so many others had failed: the Inland Empire Waterways Association or IEWA. [17]

The IEWA offered pragmatism where others had provided regionalism. For years, its primary purpose was to get slackwater to Lewiston, but IEWA members realized they would need to take detours along the way. If they had to placate mid-Columbia residents by supporting sea locks at Bonneville, they would do that. If they had to lobby for a dam at Umatilla, they would do that. They would do what needed to be done, they would appease those needing appeasing.

Although the IEWA promised a united front, other open river associations remained leery. They were not ready to abandon their own cause to join an upstart group. But Herbert G. West, the first managing secretary of the IEWA and for decades its organizational wizard, gave them no alternative. West proved tireless and ruthless in his efforts to build IEWA's membership, even at the expense of other organizations. When the Union Warehouse Company of Grangeville, Idaho, declined to pay membership dues, stating it chose to remain a member of the Western Inland Waterways Corporation, West admonished them. "There is a wide variance in the program of the Western Inland Waterways Corporation and the program of this Association," he wrote. "Other organizations wish to take some of the credit but nevertheless the glaring truth is that this Association alone has started the ball rolling for . . . development." It was not long before West's aggressiveness, combined with IEWA's effectiveness, drove all other waterway groups into extinction. [18]

West proved an excellent choice to manage the Association. He promptly got appointed to President Roosevelt's National Resources Committee and to the Water Resources Committee of the Pacific Northwest Regional Planning Commission. Within these groups he labored for a unified, systematic development of the Columbia and Snake waterway and soon attracted powerful allies. [19]

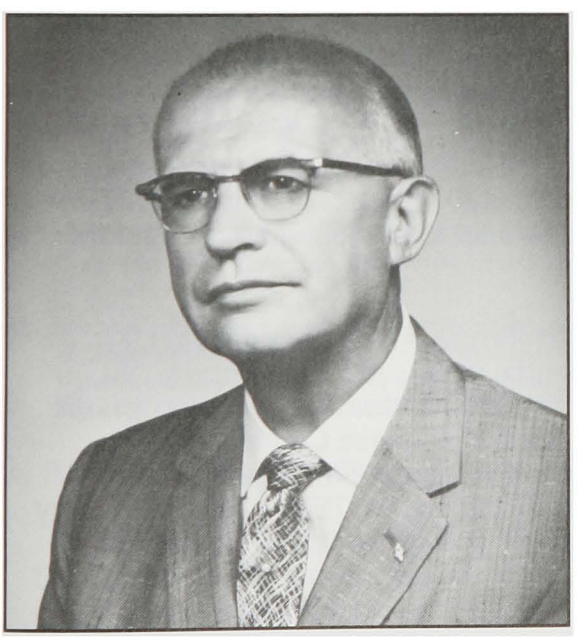
At the same time West toiled for grassroots support. "It was door to door work, in those days," he recalled of the Association's first years. "A $5 donation was big money. It was nothing to work all day in the office, then drive 50 or 100 miles to address a night meeting of farmers. My salary was $150 a month and anything over that went to promote our program." [20]

West was an indefatigable promoter, and both he and the IEWA profited. The IEWA became one of the most potent water development groups in the nation. And West, who had moved to Walla Walla from Portland in 1930 as the district representative of a small mercantile firm, became one of the region's most influential citizens. He served as Mayor of Walla Walla and became a friend of some of the country's most powerful legislators. In 1959, the Army awarded him a Certificate of Appreciation for outstanding Civilian Service. Ten years later, the Department of Defense made him the second recipient in the nation of its Civilian Service Medal. "Through his efforts," the citation of 1959 read, "'he helped to gain for the Corps of Engineers and the Army great prestige and public support." The Army did not exaggerate. As much as any other person, Herbert G. West brought slackwater to Lewiston.

Almost immediately after its organization, the IEWA won a significant victory. In the summer of 1934, West and other IEWA members prepared background materials for the Corps supporting sea locks at Bonneville. At the same time, Oregon Senator Charles McNary pushed hard for the bigger locks. When Secretary of the Interior Harold Ickes, a key Roosevelt advisor, traveled to the dam site, West met him and pressed the case. In August, the Corps announced a change in plans: sea locks at Bonneville were fully justified. The IEWA, as one of the leading advocates of the larger locks, had proven its effectiveness. [21]

In this early victory, the IEWA initiated three strategies destined to become its keys to success. First, development of the lower Snake River remained its highest priority, but it took a broad view and worked for water improvements throughout the Northwest. Second, it realized it had to work closely with the Army Corps of Engineers. And finally, West recognized that the only way to do business with Washington, D.C., was to know the power brokers there.

West understood that the Corps of Engineers would not consider Snake River projects until they had completed Bonneville and made improvements to the mid–Columbia navigation channel. Rather than complaining about lack of attention to the Snake, he threw his organization behind the Columbia projects, adroitly biding time and winning friends at the Corps.



Herbert G. West

His patience paid off. Completion of Bonneville provided two new sources of ammunition for IEWA. First, once the Corps completed the locks, shippers began using them. In 1937, the year before the Bonneville locks opened, 15,000 tons of freight went through the Cascade Canal. Two years later, 300,000 tons went past Bonneville. The new locks proved Columbia River transportation a viable alternative to railroads, provided rivers truly were navigable. [22]

At the same time Bonneville's hydropower created even more need for slackwater. "The industrial utilization of the power developed at the Bonneville and Grand Coulee dams raises for immediate consideration the related problems of transportation and markets," noted the Pacific Northwest Regional Planning Commission. "The immediate improvement of . . . channels . . . to Asotin . . . will partially solve the problems of transportation and markets for industries using the power generated." West used this new information to make his case for slackwater all the way to Lewiston. [23]

West and the IEWA developed a close relationship with the Corps. West had a habit of making the acquaintance of all District Engineers serving in Portland, and, after the Walla Walla District formed in 1948, especially those in his home town. He played golf with them, entertained them in his home, planned gala banquets when they arrived and when they moved on. No District Engineer left Walla Walla without a resolution of appreciation from the IEWA. [24]

Only the Corps could bring the improvements West coveted, but he let the Corps know it could rely on him for help, too. Technically, the Corps does not promote its own recommendations. It provides information and lets Congress make decisions. Practically, however, the Army Engineers became very adept at marshalling political support for proposed projects--projects many of its employees sincerely believed would dramatically improve the nation's waterways. One of the Corps' methods was to work through lobbying groups like the IEWA. When Division Engineer Colonel Thomas Robins urged the Association in the 1930s to work for Columbia River improvements as a prelude to Snake River work, the IEWA carried the Corps' charge into Congress. In 1970, with the Walla Walla District embroiled in an environmental controversy over Lower Granite Dam, District Engineer Colonel Robert Giesen suggested a counter-campaign of publicity by the IEWA to demonstrate that the dam still had powerful supporters. [25]

While Herbert West recognized that he needed grassroots support and the help of the Corps, he knew his most important allies would be representatives in Congress and influential members of the federal government. During every legislative session from 1934 until he retired in 1967, Herb West appeared before Congress, testifying to the need for slackwater development in the Pacific Northwest. In these well-planned, exhausting trips, Herb West usually went with a large entourage, sometimes 20 or more, of influential IEWA members. The Association published programs so those taking the trip would know the itinerary. And the itinerary was always full.

During its week in Washington, the IEWA delegation started each morning with a briefing breakfast. Then they scheduled meetings throughout the day with the most influential people in town. They would usually confer with the Corps first thing. But they would also meet with the Department of the Interior, the Bonneville Power Administration, the Bureau of the Budget, the Interstate Commerce Commission, the National Water Commission, the Department of Transportation, the Atomic Energy Commission, and presidential staffers. These were not office calls on lowly bureaucrats. Normally, the IEWA had direct entry to the highest officials. In between meetings, they testified at hearings and hosted parties for Northwest Congressional representatives. When they got home, delegates wrote their thoughts about the meetings, and Herbert West planned how to make the next year's invasion of Washington even more effective. [26]

During important legislative proceedings, West was a whirlwind of activity. Not only did he write, call, and cajole, but he also lined up chambers of commerce, port officials, petroleum companies, local and state politicians--whomever he thought had influence--to do the same. And he always maintained flexibility. If he believed, as he did in the 1930s, that he could make a strong case for Snake River development by arguing that the region could provide homes and jobs for dust-bowlers evacuating the Midwest, then he would take that position. If he believed, as he came to in the 1940s, that Snake River dams would not be authorized on navigational merits alone, then he would tout the importance of hydroelectricity. If he believed, as he did in the 1950s, that fisheries agencies might thwart dam construction, then he would argue for inclusion of expensive fish-passage facilities.

Herbert West and the IEWA eventually got their way. The Corps of Engineers constructed the dams, creating a year-round navigable channel to Lewiston. But it was a long struggle. Not until 1945--11 years after the IEWA formed and 85 years after Len White first piloted a steamboat into the Snake River--did Congress authorize the Lower Snake River project. It would be another 30 years--99 years after the Corps began construction on the Cascade Canal--before the Army Engineers finished the last dam, bringing slackwater to the Lewiston shore. Open river advocates won their war in tiny increments. The Snake River dams are a testament as much to persistence as they are to engineering ability.

Endnotes

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[1] For the best background on the long struggle to complete Cascade Locks, see William F. Willingham, *Army Engineers and the Development of Oregon: A History of the Portland District, U.S. Army Corps of Engineers* (Portland: U.S. Army Corps of Engineers, Portland District, 1983), pp. 28-36; and Willingham, "Engineering the Cascade Canal and Locks," *Oregon Historical Quarterly*, 88:3 (Fall 1987), pp. 229-57. Also, see Mills, *Stern-Wheelers Up Columbia*, pp. 75, 143-4; and Stewart H. Holbrook, *The Columbia* (New York: Rinehart and Co., 1956), pp. 286-87. For some typical editorials urging Congress to authorize construction of the canal, see *Boise Idaho Statesman,* 19 Oct. 1876; and *Lewiston Teller*, 25 Nov. 1876.

[2] For the Celilo Canal, see Mills, *Stern-Wheelers Up Columbia*, pp. 148-52; Holbrook, *The Columbia*, pp. 289-92; and Gordon Lee Merritt, "Prelude to Slack Water" (Unpublished Masters thesis, University of Idaho, 1973), pp. 26-8.

[3] The quotations are in *Oregon Historical Quarterly*, 16:2 (June 1915), pp. 124 and 131, respectively. The entire issue is devoted to the open river celebrations of May 1915. For more on the commemorations, see Walter A. Oberst, *Railroads, Reclamation and the River: A History of Pasco* (Pasco: Franklin County Historical Society, 1978), pp. 81-5; and Oberst, "Open River Celebrations Held in 1915," *Franklin Flyer*, 8:1 (April 1975), pp. 2-3.

[4] For the decline in shipping, see U.S. Congress, *Columbia and Snake Rivers*, 73rd Cong., 2d Sess., 1933, H. Doc. #16, p. 3; and U.S. Congress, *Snake River and Tributaries*, 73rd Cong., 2d Sess., 1934, H. Doc. #190, pp. 3, 47.

[5] For background on the history of American canals, see William J. Hull and Robert W. Hull, *The Origin and Development of the Waterways Policy of the United States* (Washington, D.C.: National Waterways Conference, Inc., 1967); Dwight M. Blood, *Inland Waterway Transport Policy in the U.S.* (Prepared for the National Water Commission, 1972); and William H. Shank, *Towpaths to Tugboats: A History of American Canal Engineering* (York, PA.: The American Canal and Transportation Center, 1982).

[6] U.S. Congress, *Preliminary Report of the Inland Waterways Commission,* 60th Cong., 1st Sess., 1908. S. Doc. #325, pp. iii-iv.

[7] Summaries of these early Corps' programs can be found in Forest G. Hill, *Roads, Rails, and Waterways: The Army Engineers and Early Transportation* (Norman: University of Oklahoma Press, 1957); Frank N. Schubert, ed., *The Nation Builders: A Sesquicentennial History of the Corps of Topographical Engineers, 1838–1863* (Ft. Belvoir, VA.: U.S. Army Corps of Engineers, Office of History, 1988); and Schubert, *Vanguard of Expansion: Army Engineers in the Trans–Mississippi West, 1819–1879* (Washington, D.C.: Historical Division, Office of the Chief of Engineers, 1980). For the Corps' early history generally, see Paul K. Walker, *Engineers of Independence: A Documentary History of the Army Engineers in the American Revolution, 1775–1783* (Washington, D.C.: Historical Division, Office of the Chief of Engineers, 1981). And for a succinct summary of the development of the agency, see Todd Shallat, "Engineering Policy: The U.S. Army Corps of Engineers and the Historical Foundation of Power," *The Public Historian*, 11:3 (Summer 1989), pp. 7–27.

[8] See Martin Reuss, "Andrew A. Humphreys and the Development of Hydraulic Engineering: Politics and Technology in the Army Corps of Engineers, 1850–1950," *Technology and Culture*, 26:1 (Jan. 1985), pp. 1–33; and Reuss, "The Army Corps of Engineers and Flood–Control Politics on the Lower Mississippi," *Louisiana History*, 23:2 (Spring 1982), pp. 131–48; and, for a popular account of the story, John McPhee, *The Control of Nature* (New York: Farrar Straus Giroux, 1989), pp. 3–92.

[9] For Bonneville Dam, see Willingham, *Water Power in the 'Wilderness': The History of Bonneville Lock and Dam* (Portland: U.S. Army Corps of Engineers, Portland District, 1988). For the importance of the Flood Control Act of 1936 on the Corps, see Howard Rosen and Martin Reuss, eds., *The Flood Control Challenge: Past, Present, and Future* (Public Works Historical Society,1988).

[10] For the role of the Corps of Engineers in the region generally, see Charles McKinley, *Uncle Sam in the Pacific Northwest: Federal Management of Natural Resources in the Columbia River Valley* (Berkeley: University of California Press, 1952); Estella Dee Brown, "The Corps of Engineers in the Pacific Northwest, 1866-1890", (Unpublished Bachelors thesis, Reed Collage, 1952); Gordon B. Dodds, *Hiram Martin Chittenden, His Public Career* (Lexington: University Press of Kentucky, 1973); *The History of the North Pacific Division, U.S. Army Corps of Engineers, 1888 to 1965* (Portland: U.S. Army Corps of Engineers, North Pacific Division, 1969); Mary E, Reed, *History of North Pacific Division* (Portland: U.S. Army Corps of Engineers, North Pacific Division, 1992); and Willingham, *Army Engineers and the Development of Oregon* and *Northwest Passage: A history of the Seattle District, 1896-1920* (Seattle: U.S. Army Corps of Engineers, Seattle District, 1992); Howard Preston, *A History of the Walla Walla District, 1948-1970* and *Walla Walla District History, 1970-1975* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1971 and 1976); and John R. Jameson, Keith C. Peterson, and Mary Reed, *Walla Walla District History, 1975-1980* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1982.

[11] For the state appropriation, see various correspondence from the War Department, the United States Engineer Office in Portland, and Walla Walla commercial interests to Washington Governor Albert Mead in the period January through April 1907, box 2E–2–27, Governor Albert Mead papers, Wash. Arch. For background on Corps activity along the lower Snake in the late 19th and early 20th centuries, see U.S. Congress, *Columbia and Snake Rivers*, 73rd Cong., 2d Sess., 1933, H. Doc. #16, pp. 11–12, 23–4; June Crithfield, typescript of speech delivered 9 Jy. 1967, p. 7, Cage 1820, June Crithfield papers, WSU MASC; and Caroline D. Carley and Robert Lee Sappington, *Archaeological Test Excavations of the Historic Component of 45–WT–1, Texas City/Riparia, Whitman County, Washington, 1983*, Anthropological Research Manuscript Series #77 (Moscow: University of Idaho Laboratory of Anthropology, 1984), p. 6.

[12] 1932 review of report on Columbia and Snake rivers as given in U.S. Congress, 59th Cong., 2d Sess., 1931, H. Doc. #440, RG 77, Civil Works Projects Construction Files 1925–48, box 2, Seattle NA.

[13] The comparative freight rates are quoted in "To the Corps of Army Engineers: Farm Markets and Transportation," typescript, c. 1936, cabinet V, drawer 1, "Agriculture" file, IEWA. For other similar statistics and pleas for Snake River development, see the statements of J.W. Shepard and Arthur Ward, U.S. Congress, Snake River, Oreg., Wash., and Idaho, 78th Cong., 2d Sess., 1944, Hearings before the House Committee on Rivers and Harbors, pp. 5, 18.

[14] Quoted in Marshall Dana, "The Celilo Canal––Its Origins––Its Building and Meaning," *Oregon Historical Quarterly*, 16:2 (June 1915), p. 122.

[15] The quotation is in an insightful story written by Ward about the history of Columbia and Snake river improvement organizations, *Lewiston Morning Tribune*, 7 Jan. 1934. For additional information on the plethora of improvement associations, see Merritt, "Prelude to Slack Water;" U.S. Congress, *Snake River and Tributaries* (1934), pp. 51–2; and Wallace R. Struble to John Haines, Governor of Idaho, 10 Jan. 1914, box 2H–2–86, Governor Ernest Lister papers, Wash. Arch.

[16] The first quotation is in a brief of the Western Inland Waterways Corporation to the Board of Engineers for Rivers and Harbors, 1933, RG 77, NPD files, box 6, vol. 8, Seattle NA. The second is from an editorial in the *Lewiston Morning Tribune*, 14 Feb. 1934.

[17] Details on the Lewiston meeting and the subsequent formation of the IEWA can be found in numerous news stories in the *Lewiston Morning Tribune* for the dates February 7–25, 1934. For a good summary of the meeting and IEWA formation see Merritt, Prelude to Slack Water, pp. 61–9.

[18] West to Union Warehouse and Supply Co., Grangeville, 11 Oct. 1934, cabinet V, drawer 4, "Grain Growers," 1934–50 file, IEWA.

[19] Merritt, Prelude to "Slack Water," pp. 69–70.

[20] The quotation is in *Spokane Spokesman–Review*, 15 Oct. 1967. For other biographical sketches of West, see *Walla Walla Union–Bulletin*. 14 Jy. 1959; IEWA 25th anniversary party booklet, cabinet XI, drawer 2, "Herb West" file; Correspondence Files, "Lower Monumental––H.G. West Lake" folder, PAO WWD; and Ted Van Arsdol, "History of Ice Harbor Dam," typescript, 1962, Cage 117, Ted Van Arsdol papers, WSU MASC.

[21] Merritt, "Prelude to Slack Water," pp. 68–9; Willingham, *Water Power in the Wilderness*, pp. 13–14.

[22] Tonnage statistics from M.J. Vennewitz, "Navigation on the Columbia River, 1897–1939", typescript, 1940, cabinet VI, drawer 4, "Navigation" file, IEWA.

[23] Statement at Corps of Engineers' public meeting, Lewiston, 15 May 1935, RG 77, Civil Works Projects Construction Files 1925–48, box 4, Seattle NA.

[24] Various letters attesting to the close personal and professional relationship between West and Walla Walla District Engineers can be found in cabinet VI, drawer 1, "Walla Walla District" file, IEWA.

[25] See West to Oregon Representative Walter Pierce, 18 Dec. 1936, and Pierce to West, 27 Dec. 1936, Walter Pierce papers, "Columbia River, General Correspondence," box 1, UO; and Giesen, inter–departmental memo, c. Feb. 1970, RG 77, Acc. #T77–85–0018, WWD files, box 9, Seattle FRC.

[26] Programs outlining lobbying activities and accounts of lobbying trips by delegates can be found in numerous places in the IEWA papers, usually under the file heading "Mission (or Delegation) to Washington," followed by the appropriate year.

Chapter 6
"...Construct Such Dams as are Necessary..."

Build the dams and development will follow, Herbert West said. He told it to Congress, port districts, chambers of commerce, schools, farmers.

Build, and the Snake River will become a lifeline to one of the world's richest agricultural regions. Break the stranglehold of railroads, and freight rates will plummet. New industries will rise. Population will increase.

But the government could not authorize dams without economic justification. Railways adequately handled the region's freight, so there was no need to construct locks. And the dams' power would go unused in the sparsely populated Pacific Northwest.

Herbert West faced a quandary: not enough development existed to justify the projects, yet without dams the region would never develop.

Some environmental groups in the 1960s and 1970s criticized the Army Corps of Engineers for advocating water projects that would produce profits for developers and work for engineers. Those who sought authorization for lower Snake dams might have wished for such a relationship. For years the Army Engineers, finding major river improvements economically unjustified, foiled the hopes of business people and Northwest Congressmen who sought dams and locks on the lower Snake.

As early as the 1890s, Pacific Division Engineer Colonel George Mendell reported to Congress that he found extensive navigational improvement of the lower Snake infeasible: railroads had virtually eliminated river traffic; the dry river banks had no fuel for woodburning steamers; steep canyon walls separated the river from prime agricultural lands. [1]

These obstacles did not deter river adherents. The Lewiston Commercial Club lobbied Idaho's Congressional representatives to pay for a survey determining the river's navigational feasibility. In 1915, they got their survey, but not the desired results. The Army Engineers again found no justification for expensive improvement of the little–used river. [2]

In 1924, river boosters persuaded the Corps to survey again. Three Army officers, including Division Engineer Colonel W. J. Barden, boarded the government steamer *Umatilla* at Lewiston. The *Umatilla*, made for shallow water transportation, drew only three and a half feet. But even that trifling draft proved no match for the Snake at low flow. The boat clumsily proceeded downriver stern–first, raking itself over rapids, occasionally grounding on rocks. The party disembarked at Riparia and waited two days for a wind storm to pass. Finally the Engineers, abandoning the cause, took a train to Seattle.

"I do not think," Barden reported, "a channel of [5 feet] could be obtained and maintained" at a justifiable expense. Barden addressed only the simple task of blasting rocks and removing shoals. He did not even contemplate building dams. [3]

In 1932, Lieutenant Colonel Thomas Robins, Pacific Division Engineer, conducted a review of the lower Snake in response to a Congressional resolution. The colonel pointed to the sad history of Celilo Canal, sitting virtually unused, and cautioned against hurried development on the Snake, development that might result in similar unwise federal expenditures. He urged caution, recommending minimal channel clearing. First develop the Columbia, he suggested, determine whether traffic justified additional expenses, and only then proceed to improve the Snake. [4]

Open river adherents protested. Columbia and Snake river improvement should not be "split up and constructed piece-meal," stormed Arthur Ward of Lewiston's Western Inland Waterways Corporation. "It should be authorized and constructed as a whole." Development advocates sympathized little with Robins' urge for caution merely because of the meager traffic then existing. "It has always been my theory," wrote the traffic manager for Lewiston's largest industry, Potlatch Forests, "that once barge transportation was established it would build for itself new tonnage which is not now moving." Build the dams and development will follow. [5]

To determine the region's attitudes about open river development, the United States Senate conducted hearings in Portland and Lewiston in 1932, shortly after Robins made his recommendations. Governors, legislators, and representatives of open river associations pleaded for immediate and simultaneous construction of dams on the mid-Columbia and lower Snake. Galleries of farmers, river pilots, shippers, and business people cheered. In two days of testimony only the Corps' Robins spoke against immediate construction, again urging caution: take the projects a step at a time. Although outnumbered, Robins' voice proved the most influential. Congress would not authorize Columbia or Snake river dams in 1932. [6]

In 1933, the Army Engineers submitted the long-awaited Snake River "308 Report" that Congress had authorized in the 1920s. It was another disappointment for developers. In addition to Pacific Division Engineer Robins, the District Engineer and Chief of Engineers also found dams and locks unjustified. The region did not need hydropower, and virtually no shippers used the river. Benefits did not come close to equaling costs. [7]

A few months later, Lewiston hosted the open river rally that spawned the IEWA, and Herbert G. West began his long campaign to bring slackwater up the Snake. The IEWA initially had no more luck convincing the Corps of the dams' justification than had earlier organizations. But when the Association applied pressure to legislators, Congress ordered the Corps to continue studying the Snake.

A 1936 Corps of Engineers report recommended a dam on the Columbia at Umatilla as well as a series of ten locks and dams between Pasco and Lewiston. That was the good news. The bad news for the IEWA was that the Corps still would not back Snake River construction until they had completely developed the lower and middle Columbia. [8]

The following year, Robins penned a more favorable report to Congress. After considering the possibility of ten dams along the lower Snake, he concluded that four would provide adequate navigation. For the first time he spoke of "indirect benefits," thus coming over to the side of the IEWA in the long controversy over whether to first build and then wait for development, or wait for development before building. Low-cost water transportation and cheap power would bring agricultural and industrial maturity, Robins claimed. [9]

Lieutenant Colonel Thomas Robins

In accordance with the Corps of Engineers' review procedures, Robins' report next went to the Board of Engineers for Rivers and Harbors. Agreeing that dam construction would stimulate regional growth, the Board seconded his recommendation for authorization. As the last step in the process, Major General J.L. Schley, Chief of Engineers, reviewed the document. Schley agreed dams would bring development, but did not believe the extreme costs justified federal expenditures. Nonetheless, he held out hope that Congress might authorize lower Snake development in the future. [10]

Though it was the most positive Corps report to date, Herbert West remained unsatisfied. He worked closely with Northwest Congressional delegates, helping to convince them to introduce 24 measures in the 1930s requesting navigational improvements on the Columbia and Snake. But without Corps' endorsement, West would fail. Congress relied heavily on the opinions of the Army Engineers. As long as the Corps did not completely support development, Congress was unlikely to authorize Snake River dams.

The 1930s ended with Colonel Robins and the Corps more favorable toward Snake River slackwater than at the decade's start, but the Engineers were not wholehearted advocates. They agreed river development would eventually bring economic growth, but Congress proved unwilling to authorize dams based on future predictions. With dramatic national and regional changes in the 1940s, Congress finally agreed to pay for a series of dams along the lower Snake River. But even then authorization did not come easily, for the Snake River dams had detractors nearly as influential as their advocates.

Some opposition came from people jealous of federal money flowing to the Inland Empire. The Snake River project rekindled old animosities between north and south Idaho and east and west Washington. Puget Sound business people fought authorization because they viewed an open river as an open door luring inland trade by boat to Portland rather than by rail to Seattle and Tacoma. The Seattle Chamber of Commerce kept up the battle even after Congress authorized the projects, attempting to persuade legislators to withhold money for the "uneconomical and unwarranted" project. [11]

But western Washington's protest proved mild compared to southern Idaho's. Idaho's population was concentrated in the state's southern, arid plains. People settled close to the Snake, which provided water to irrigate crops. As Congress considered developing the lower Snake, southern Idahoans worried the Army Engineers might appropriate their irrigation water for downstream navigation and power production. "For 30 years there has been discussed the possibility of converting the lower Snake river into a navigable stream to Lewiston," wrote a Boise civil engineer in 1941. "Southern Idaho business men have slept through this discussion . . . on the part of northern interests, that some day this navigation program would rob south Idaho of a vast agricultural empire." [12]

The Corps attempted to allay fears. "This office . . . does not want to get into any political arguments," Portland District Engineer Colonel C.R. Moore wrote, "but it seems ridiculous to consider the improvement of the river below Lewiston for navigation as in any way adversely affecting irrigation interests." Moore maintained that lower Snake dams would create navigable reservoirs by utilizing flows entering the Snake below the irrigation districts, waters fed by the Salmon, Clearwater, Grande Ronde, and other rivers. [13]

The Corps could easily diffuse the irrigation argument, but the underlying causes of concern lay more deeply rooted. Southern Idaho business interests fought the Snake River plan because they feared it would bring an economic boom to Lewiston at the expense of Boise. Animosities between the two communities went back to the 1860s, when Boiseans "stole" the territorial capital, and residents of the two cities had never stopped sniping at one another.

An even more serious obstacle to development, however, was a power struggle in the Pacific Northwest between the nation's two biggest dam builders, the Army Corps of Engineers and the Bureau of Reclamation, created by Congress in 1902 to develop irrigation projects and encourage settlement in the arid West. As each agency struggled for increased Congressional appropriations, the Bureau formed alliances with irrigators, just as the Corps nurtured relations with organizations like the IEWA. With the increase in authorization of multipurpose water projects, the line separating major responsibilities between the two agencies blurred, heightening the rivalry for federal funds. No longer did the Bureau construct projects only for irrigation and the Corps only for navigation.

The Department of the Interior's Bureau of Reclamation vigorously opposed a 1941 bill authorizing the Corps to build dams along the lower Snake. Viewing this construction as a threat, Interior officials encouraged the House Committee on Rivers and Harbors to reject the bill, or at the very least insert an amendment giving the Department veto power over Corps' activities along the river. It might not have been the decisive factor, but when the Secretary of the Interior speaks forcefully against a water project it has an effect, and Congress did not authorize Snake River development in 1941. [14]

In 1944, Interior attempted to attach a similar amendment to legislation then being debated. The IEWA countered, "We do not object to the Corps of Engineers consulting with the Secretary of the Interior . . . but certainly we do not want them to be subservient." Once again it was a moot point as Congress refused authorization. [15]

The next year Congress did authorize the dams, but Interior's objections continued. In 1947, it protested the modest irrigation benefits the Corps claimed for Ice Harbor Dam, stating that the Bureau of Reclamation's Columbia Basin project could provide all needed irrigation in the Pasco area. It was a futile complaint brought by an agency that had lost the major battle. The Corps would build its dam, and would be allowed to claim irrigation benefits. Ice Harbor never competed with the Columbia Basin project in irrigation significance. But by the 1990s, its pool provided water to more than 36,000 acres of rich farm, orchard, and vineyard lands along the river. [16]

The Corps, in protecting its regional interests, took the Bureau's threat seriously. The Corps assumed it would build the Snake River dams if Congress eventually authorized them, but as Engineer B.E. Torpen noted in 1943, when assessing the potential for the Bureau to "sneak" into the lower Snake River: "As . . . navigation is . . . solely a function of the Army Engineers, it is probable that the dams involved will be constructed by that agency. However, these dams may create greater benefits for power than for navigation in the future and as they come up for future construction, other Federal Agencies may seek supervision of their construction. Such things have happened." [17]

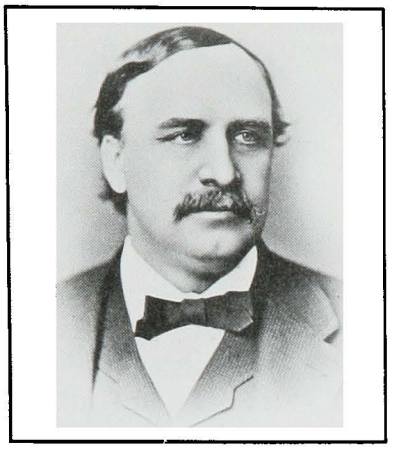
While the IEWA attempted to ameliorate sectional differences and the Corps worked to insure its primacy over the Bureau along the lower Snake, open river advocates faced another opponent that attempted to dissuade Congress from authorizing the projects: railroads. Western Washington might lose a little trade, southern Idaho worried about Lewiston's economic growth, and the Bureau of Reclamation fretted about loss of influence. But railroads had more serious reasons to fear navigation. Barges navigating the Columbia and Snake to Lewiston could potentially put the railroads along these rivers out of business. Railways had invested a great deal of money building lines to tap the Inland Empire's lucrative wheat trade. They were not about to sit idly while groups like the IEWA advocated inexpensive barge competition. Fighting hard against the lower Snake project, the railroads had a good number of influential Congressional representatives on their side. They proved a worthy rival for Herbert West.

If one person finds a market, others usually appear to help share the profits. Steamboat companies reaped the early rewards of the lower Snake region's gold and crops. But railways soon followed, crisscrossing the land with track. By the time Celilo Canal opened, railroads were entrenched, and sternwheelers never regained their threshold.

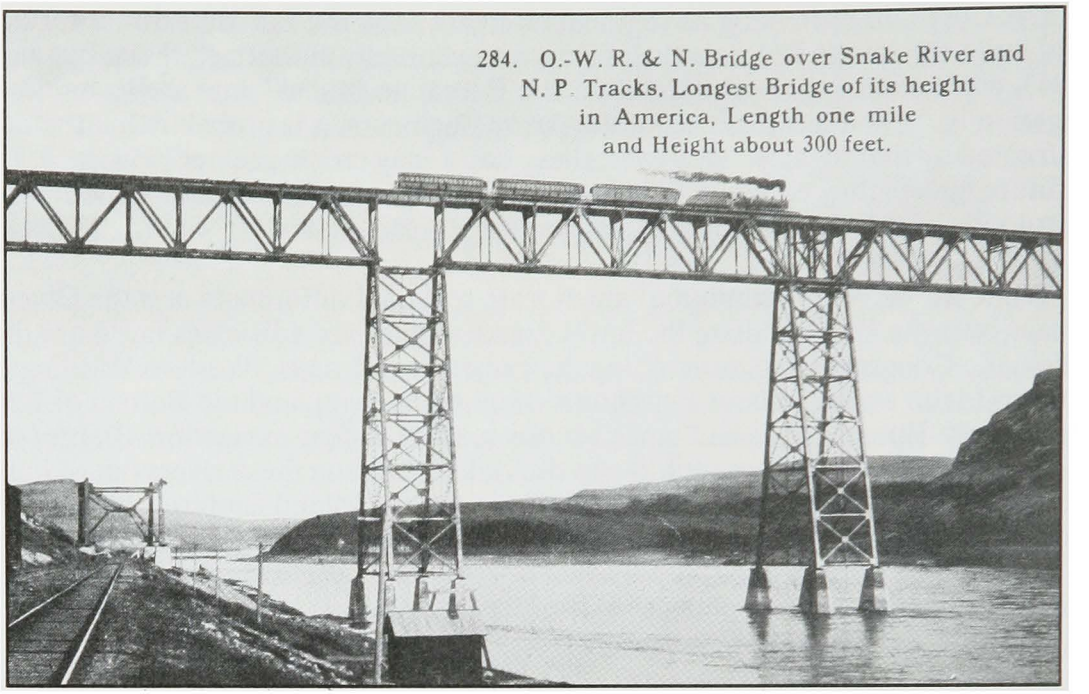
Railroad construction along the lower Snake began in uncompetitive harmony. Henry Villard, German-born financier, gained control of both the Oregon Railway and Navigation Company and the Northern Pacific Railroad, and his two systems cooperated in the initial surge into the lower Snake region.

Recognizing the rich potential of inland graineries, Villard supervised the area's initial rail construction in the 1880s. He built the first bridge across the lower Snake at Ainsworth, then stretched a line from Wallula on the Columbia to Riparia on the lower Snake, eliminating steamboat transportation between those two points. But Villard had financially overextended himself, and in 1884 his empire collapsed. The Northern Pacific and Oregon Railway and Navigation Company reverted to separate ownership. The Union Pacific gained control of the Oregon Railway and Navigation Company, and the two great railroads--Northern Pacific and Union Pacific--entered an era of dizzying construction and competition along the lower Snake. Days of railroad harmony ended. [18]

In 1899, the Union Pacific constructed a more direct route between Riparia and Wallula, following the south bank of the river. Ten years later the Spokane, Portland, and Seattle constructed a parallel, competing track on the north bank between Riparia and the Columbia. Then, the Union Pacific and Northern Pacific did something unusual: they combined forces to lay track of the Camas Prairie Railroad from Riparia into Lewiston, thereby virtually eliminating the need for steamboat traffic along any portion of the lower Snake.



Henry Villard



The Joso railroad bridge.

Although the Northern Pacific and Union Pacific cooperated on one line, competition remained strong. The Union Pacific had an excellent line to Portland and completely dominated the Walla Walla country south of the Snake. But it had no entree into the rich agricultural lands of the Palouse north of the Snake, nor to Spokane. Edward Harriman, Union Pacific's chairman, decided to alleviate this disadvantage and in 1910 the Union Pacific secretly bankrolled construction of one of the world's longest and highest trestle bridges at Joso. The 3,920–foot–long bridge crossing the Snake stood nearly 300 feet above the water, providing Harriman access to the Palouse. The two great railroads, which had fought to a draw in the region, laid little new track after workers completed the Joso bridge in 1914. [19]

While the railroads along the Snake fought for routes and business, they always united in one effort: go to any extreme to eliminate the threat of water–borne competition. Dealing with steamboats proved no particular problem. When the Cascade and Celilo canals opened, railways lowered rates and the slower, smaller steamers could not compete. The same happened when railroads built along the lower Snake, bankrupting steamboat companies.

But by the 20th century, navigation technology began changing. Now it became possible to haul tremendous loads inexpensively with tugs and barges. The railroads could not ignore this threat, and they did not. The federal government should not subsidize one form of transportation over another, the railroads argued, conveniently forgetting the huge land-grant the nation gave the railways in the 19th century. Furthermore, they proclaimed it unfair for people in places like New York to pay for river developments in a sparsely populated region of the Pacific Northwest. [20]

The IEWA attempted to thwart this opposition from railroads. The Corps, questioning the economic feasibility of lower Snake development, pointed to the history of navigational improvements along the Columbia and how railroads put shippers out of business. Herbert West countered that things had changed and barges could now effectively compete with railroads. Besides, even if railroads garnered a large share of

the traffic, locks would pay rich benefits to inland farmers because competition would force railroads to permanently lower rates. [21]

Throughout the 1930s, the Corps steadfastly disagreed with the IEWA. They could not justify navigational improvements simply to lower freight rates. "We believe that it is not enough to improve waterways, if the net result is a rail rate reduction with little or no use of the water," Portland District Engineer Major Oscar Kuentz stated before a group of river advocates in 1932. The arguments raged for years, between south and north Idaho, east and west Washington, the Bureau of Reclamation and the Corps of Engineers, railroads and advocates of navigation. Those opposing Snake River development stymied the efforts of groups like the IEWA to obtain Congressional authorization for locks and dams. Try as they might, Herbert West and his Congressional allies could not prevail. [22]

Despite West's vigorous efforts, the lower Snake might never have been dammed had not World War II intervened. Suddenly, the debate shifted radically. Open river advocates no longer based their case primarily on navigation. Now they had the leverage of another issue, the sudden need for hydropower. Hydropower benefits, combined with those of navigation, proved too much for opponents. Congress would finally authorize the lower Snake project.

Lieutenant Colonel Thomas Robins' plans for an orderly, cautious development of the Columbia River system ended the day Franklin Roosevelt took office as President of the United States. Searching for ways to put masses of unemployed laborers to work, Roosevelt ignored Robins' plea for caution and advocated constructing large federal dams in the Pacific Northwest. The Bureau of Reclamation would build Grand Coulee, and the Corps, Bonneville.

Completed several years later, these dams proved what Herbert West had long suspected: once built, dams would attract development. But development came not because of improved navigation. Rather, it arrived because of inexpensive hydroelectricity. Bonneville and Grand Coulee initiated a tremendous era of dam construction in the Pacific Northwest, transforming the region into a major industrial center. Dam–building proved a major turning point in the area's history.

Prior to Bonneville and Grand Coulee's completion, the Corps remained skeptical about the region's need for hydropower. "The prospects for marketing of power from the Snake Basin are not encouraging," the Engineers reported to Congress in 1934, in a typical assessment for the decade. Many others also believed the Northwest would soon be glutted with energy. Critics referred to Bonneville as the "dam of doubt," and Grand Coulee as a "white elephant in the wilderness." Generators would rust, spillways crumble, transmission lines go unused. There simply was no place to market the electricity these dams would produce, let alone the many thousands of additional kilowatts from dams on the lower Snake. But when Bonneville came on line in the late 1930s, the economics of Northwest dam building changed dramatically. Development did follow the dams. [23]

More specifically, the aluminum industry followed the dams. Spurred by the need for inexpensive aluminum for airplanes during World War II, the Aluminum Company of America constructed the region's first plant at Vancouver, Washington. Soon, five other factories in Washington and Oregon were producing the metal. By the 1950s, the Pacific Northwest turned out nearly half of all the United States' aluminum. Post–war uses in such diverse products as air conditioners, commercial airplanes, automobiles, foil, roofing, and windows guaranteed a permanent market. As late as 1945, *Fortune* magazine predicted a tremendous energy surplus in the Northwest once the war ended. But by 1947, the Bonneville Power Administration––a

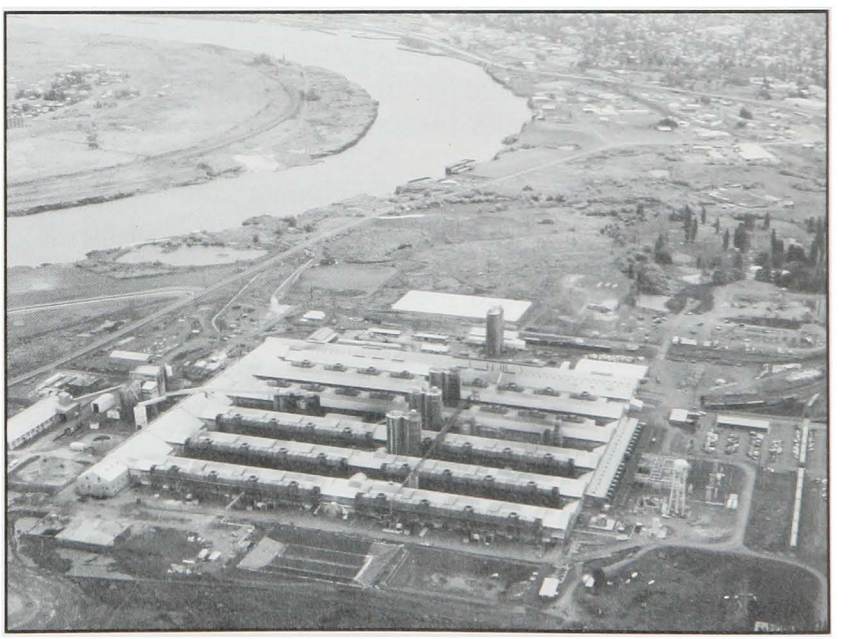
federal agency created to market the region's power--predicted that the "Pacific Northwest will continue to experience an acute power supply problem for years to come," and urged continued construction of federal hydroelectric dams. The aluminum industry contracted for every kilowatt of energy not used by households or other businesses. There was no power surplus; the region was rapidly growing; Northwest residents needed more hydropower in order to attract more industry and workers. [24]

Even before this, however--indeed, as early as 1941--Thomas Robins, now the Assistant Chief of Engineers, ended his long "cautious" approach and urged Congress to authorize a series of dams to bring slackwater to Lewiston and produce energy. It was the Corps' first instance of unqualified support of the lower Snake project. Even so, Congress again refused authorization. [25]

Another bill to authorize construction reappeared before Congress in 1943, and again the Corps favored the project, noting the area's need for additional power. "It would not be profitable to construct these dams merely to provide for navigation," Brigadier General John Kingman testified. Add hydropower benefits, however, and he could easily justify the dams. Again, though, Congress refused. [26]

Congress did not pass yet another bill to authorize dam construction the following year, even though House and Senate committees both approved the proposal. In addition to constraints on all domestic programs forced by America's involvement in World War II, Congress now became embroiled in confusion about the number of dams the Corps would build.

Since the Corps began surveying the lower Snake it had debated the merits of the number of dams to construct between Pasco and Lewiston. Some engineers believed four sufficient to produce the slackwater and hydroelectricity desired. Others opted for six, and some ten. Ten dams represented a duplication of construction, but would not require costly relocation of railways since reservoirs would remain low enough to permit existing tracks to stay. Four to six dams would necessitate expensive track relocation, but less duplication. Without agreement on how many dams to build, Congress refused to authorize any proposal. [27]



Aluminum plants like this one along the Columbia River used large quantities of hydropower from the federal dams.

The Corps could not resolve the issue without further study, but hesitated to undertake expensive studies unless Congress intended to authorize construction. Finally, Congress bridged the impasse by authorizing the Corps to construct "such dams as are necessary" to provide slackwater along the lower river. Congress passed Public Law 14 on March 2, 1945, ending the long struggle for authorization.

In the following two years, the Corps conducted a number of studies and consulted with various governmental agencies to determine the optimum number of dams. Building four dams would necessitate construction of the highest lift locks ever designed, over 100 feet high. In addition, the Corps questioned whether migratory fish could negotiate such a series of dams. On the other hand, a four–dam system would produce more hydroelectricity and was the most cost–effective to construct.

State fisheries agencies, while questioning whether fish could survive any additional dams along the Columbia/Snake waterway, reluctantly agreed it was better to erect four rather than six or ten. The Idaho Department of Fish and Game summed up the opinion of fisheries agencies: "After giving thought to the many problems involved, we feel that possibly less harm may be done by the four dam plan [although] this letter is in no way intended as an endorsement . . . for construction of [any] dams in the Snake River." The reaction of fisheries agencies helped convince the Corps four dams provided the best solution. On April 23, 1947, the Chief of Engineers instructed the North Pacific Division to proceed with plans to build four dams between Pasco and Lewiston. [28]

Eighty–five years after Captain Len White piloted the *Colonel Wright* up the Snake and envisioned a time when the river would be navigable year–round, Congress authorized the lower Snake River project. The IEWA, grain growers, barge companies, and chambers of commerce celebrated. Railroad workers viewed the project apprehensively. And those concerned with preserving fish runs harbored serious reservations.

But it appeared, in 1945, that developers had won. Little did Herb West and his colleagues know it would be another three decades before the Corps would finally complete the inland passageway to Lewiston; that the contest for authorization would pale in comparison to battles over construction; and that there lay ahead many unforeseen compromises to protect the natural environment. Most of those who advocated the dams in the 1920s, 1930s, and 1940s would be dead before the first barge plowed through slackwater to Lewiston in the 1970s.

Endnotes

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[1] Mendell to Chief of Engineers, 8 Oct. 1895, RG 77, entry 103, box 1112(3), Nat. Arch.

[2] Board of Engineers, "Public Notice Relative to the Proposed Improvement of the Snake and Columbia Rivers, March 1923," file 24443(1667); Wallace R. Stubble, Lewiston Commercial Club, to Sen. William Borah, 23 Jy. 1912; file 24443(1644); Congressman Burton French to Chief of Engineers, 2 Aug. 1912, file 24443(1644); Sen. Weldon Heyburn to Sec. of War Henry Stimson, 7 Aug. 1912, file 24443(1642). All in entry 103, box 522, Nat. Arch.

[3] Barden to Chief of Engineers, 3 Nov. 1923 file 2334(9); 4 Dec. 1924 file 2334(22); 2 Jan. 1924 file 2334(11). All in entry 103, box 575, Nat. Arch.

[4] U.S. Congress, *Columbia and Snake Rivers*, 73rd Cong., 2d Sess., 1933, H. Doc. 16.

[5] For the quotations, see Arthur E. Ward, "General Presentation in Support of Senate Bill No. 2670," typescript, 1932, cabinet VI, drawer 3, "Snake River Improvement Hearing" file, IEWA; and Roy Huffman, Traffic Manager, Potlatch Forests, Incorporated, to Maj. O.O. Kuentz, Portland District Engineer, 22 Mar. 1932, RG 77, Civil Works Projects Construction files 1925–48, box 2, Seattle NA. For an earlier version of the "build and development will follow" argument, see *Lewiston to Portland by Water in 1905: Resolutions Demanding the . . . Opening of the Upper Columbia and Snake Rivers to Navigation, Adopted . . . 1901* (Portland: Chamber of Commerce, 1901).

[6] *Lewiston Morning Tribune*, 7 Sept. 1932; U.S. Congress, Hearings on a Bill to Provide for the Improvement of the Columbia and Snake Rivers . . .S. 2670 and S. 4408, 72d Cong., 2d Sess., 1932.

[7] U.S. Congress, *Snake River and Tributaries*, 73d Cong., 2d Sess., 1933, H. Doc. 190. The complex efforts by developers in the 1930s to lobby for slackwater, the role of the IEWA, the numerous public hearings, and the role of the Corps of Engineers and Congress, is conveniently summarized in Gordon Lee Merritt, "Prelude to Slack Water" (unpublished Masters thesis, University of Idaho, 1973), esp. pp. 38–87.

[8] Merritt, "Prelude to Slack Water," pp. 72–3.

[9] U.S. Congress, *Columbia and Snake Rivers*, Oreg., Wash., and Idaho, 75th cong., 3d Sess., 1938, H. Doc. 704. Also see *Lewiston Morning Tribune*, 12 Je. 1938, and, for hearings in Lewiston prior to Robins' report, *Lewiston Morning Tribune*, 17 Feb. 1937.

[10] *Columbia and Snake Rivers*, 1938, H. Doc. 704.

[11] The quotation is in John Ulrich to "Director of Information," 12 Mar. 1959 memo on hearings in Lewiston, box 100, NPPA. For earlier protests by Puget Sound interests see Fred Schaaf, Director, Department of Public Service, memorandum to Gov. Clarence Martin, 3 Feb. 1937, box 2K–2–25, Clarence Martin papers, Wash. Arch.

[12] The letter appeared in the Boise Idaho Statesman, quoted in Lt. Col. C. R. Moore, Portland District Engineer to A.L. Alford, Lewiston, 1 Dec. 1941, cabinet VIII, drawer 2, "Snake River Improvements" file, IEWA. Also see Representative Compton White to E.W. Rising, Southwestern Idaho Water Conservation Project, 11 Mar. 1944, RG 77, WWD files, box 7, Seattle NA.

[13] Moore to Herbert West, 9 Jan. 1942, RG 77, WWD files, box 5, Seattle NA.

[14] E.K. Burlew, Acting Sec. of the Interior to Rep. Joseph Mansfield, Chairman, House Committee on Rivers and Harbors, 8 Oct. 1941, RG 77, WWD files, box 5, Seattle NA.

[15] Herbert West to Portland District Engineer Col. Ralph Tudor, 20 Mar. 1944, RG 77, WWD files, box 7, Seattle NA.

[16] Portland District Corps of Engineers, "Supplement to Special Report on Selection of Sites, Lower Snake River," 14 Mar. 1947, RG 77, Civil Works Projects Construction files 1925–48, box 9, Seattle NA. The 1990s Ice Harbor irrigation statistics were provided in WWD to the author, 29 Apr. 1992.

[17] B.E. Torpen, Memorandum on trip to Lewiston, Idaho, 4 Sept. 1943, RG 77, WWD files, box 17, Seattle NA.

[18] The railroad history of the Pacific Northwest in general and the Snake River in particular is complicated, but has been well documented. The following discussion comes from these sources: Meinig, *The Great Columbia Plain*, pp. 241–83, 382–83; Peter J. Lewty, *To the Columbia Gateway: The Oregon Railway and the Northern Pacific, 1879–1884* (Pullman: Washington State University Press, 1987); Enoch A. Bryan, *Orient Meets Occident: The Advent of the Railways to the Pacific Northwest* (Pullman, WA.: Students Book Corporation, 1936); Charles R. Wood and Dorothy Wood, *Spokane, Portland and Seattle Ry., the Northwest's Own Railway* (Seattle: Superior Publishing Co., 1974); James L. Ehernberger and Francis G. Gschwind, *Smoke Along the Columbia: Union Pacific, Oregon Division* (Callaway, NE.: E.G. Publications, 1968); and James B. Hedges, *Henry Villard and the Railways of the Northwest* (New York: Russell & Russell, 1967).

[19] For a look at the fascinating history of Joso bridge construction, see Priscilla Wegars and Roderick Sprague, *Archaeological Salvage of the Joso Trestle Construction Camp, 45–FR–51, Lower Monumental Project*, Anthropological Research Manuscript Series #65 (Moscow: University of Idaho Laboratory of Anthropology, 1981).

[20] See, for example, the testimony of John T. Corbett, National Legislative Representative of the Brotherhood of Locomotive Engineers, U.S. Congress, Columbia and Snake Rivers, Oreg., Wash., and Idaho: Hearing Before the Committee on Rivers and Harbors, 78th Cong., 1st Sess., 1943, pp. 36–40.

[21] See West to J.B. Fink, Director, Washington Department of Conservation and Development, 26 Nov. 1937, box 2K–2–25, Clarence Martin papers, Wash. Arch.

[22] The quotation is in Kuentz, Address before the annual meeting of the Columbia Valley Association, Lewiston, 15 Feb. 1932, RG 77, Civil Works Projects Construction files 1925–48, box 2, Seattle NA.

[23] For the Corps' quotation, see U.S. Congress, *Snake River and Tributaries*, 1934, H. Doc. 190, pp. 4–5.

[24] For synopses of the growth of the aluminum industry in the region see *Columbia River Power & The Aluminum Industry: A Research Report* (Portland: Bonneville Power Administration, 1953). The quotation is on p. 8. Also see Richard L. Neuberger, "Feud in the Northwest: The Vendetta Against Aluminum," *Frontier*, 5:4 (Feb. 1954), pp. 15–16; and *Aluminum in the Northwest and What It Means to You* (Walla Walla: Inland Empire Waterways Association, c. 1953). For the Bonneville Power Administration see Gus Norwood, *Columbia River Power for the People: A History of Policies of the Bonneville Power Administration* (Portland: Bonneville Power Administration, 1981); and Vera Springer, *Power and the Pacific Northwest: A History of the Bonneville Power Administration* (Portland: Bonneville Power Administration, 1976).

[25] U.S. Congress, *Snake River, Oreg., Wash., and Idaho*, 77th Cong., 1st Sess., 1941, Hearings Before the House Committee on Rivers and Harbors.

[26] U.S. Congress, *Columbia River (Umatilla Dam) and Snake River, Oreg., Wash. and Idaho*, 78th Cong., 1st Sess., 1943, Hearings Before the House Committee on Rivers and Harbors, p. 3.

[27] For background on the issue over the number of dams see "Legislative History of Fight for Ice Harbor Dam," Inland Empire Waterways Association press release, 10 Aug. 1955, cabinet VIII, drawer 1, "Ice Harbor" file, IEWA; U.S. Congress, Snake River, Oreg., Wash. and Idaho, 1941, p. 7; and "Special Report on Selection of Sites, Lower Snake River," Apr. 1947, RG 77, WWD files, box 9, Seattle NA.

[28] Comments from various fisheries agencies as to the number of dams, written in November and December 1946, can be found in RG 77, Acc. #T77–82–0060, WWD files, box 4, Seattle FRC. The quotation is in James O. Beck, Director, Idaho Department of Fish and Game to Corps, 25 Nov. 1946. For the Chief's decision see Chief of Engineers to North Pacific Division, 23 Apr. 1947, RG 77, WWD files, box 9, Seattle NA.

Chapter 7
Battle for Ice Harbor

Near the end of World War II, Congress authorized the Corps of Engineers to construct four dams along the lower Snake River. It also instructed them to build the long–debated multipurpose dam at Umatilla, later named for Oregon Senator Charles McNary, and to erect Lucky Peak Dam near Boise. The new work strained the capacity of the Portland District office, and in 1947, the North Pacific Division Engineer decided the Corps needed an additional district to complete all the tasks. He appointed Colonel William Whipple to select a site for the Army Engineers' newest headquarters. [1]

Whipple traveled to Pendleton. He investigated Pasco. He sounded out the residents of Boise and Spokane. Finally, he selected Walla Walla as the most appropriate site. The ubiquitous Herbert West had some influence on that decision.

West provided Whipple and his small staff with temporary office space in Walla Walla and asked residents to furnish housing. He encouraged entrepreneurs to form the Blue Mountain Housing Company to construct permanent homes for Corps employees. His efforts paid off when, in September 1948, the Army announced Walla Walla had won the site competition. Colonel Whipple became the first District Engineer.

Whipple quickly assembled his key staff, and the District began hiring engineers and support workers. The Portland District had completed preliminary design work on the lower Snake project and had determined the approximate locations of the four dams. But when the Walla Walla District officially opened on November 1, 1948, it assumed primary responsibility for developing the lower Snake River. It would receive most of the credit and, from some circles, the bulk of the blame, for completing the long–awaited inland passageway to Lewiston.

Col. William Whipple, center, first Walla Walla District Engineer, at McNary Dam construction site, 1948.

It was the Walla Walla District that would oversee the dams that produced electricity; the Walla Walla District that created new recreation facilities; the Walla Walla District that provided access to new ports and created jobs and brought economic growth to the lower Snake region. The Walla Walla District would construct the world's largest steelhead fish hatchery; begin Operation Fish Run, one of the more unique conservation projects in Corps history; and oversee a multi-million dollar plan to compensate for fish and wildlife losses.

It was also the Walla Walla District that would face a maze of new laws regarding water resource development during the 30 years that lapsed between authorizing the projects and completing them; the Walla Walla District that would bear the brunt of criticism from environmentalists; the Walla Walla District that would field the ire of landowners who tried to prevent their property from being condemned.

It would be an exhilarating and bumpy road for the District. The lower Snake River project would become a case study of the nation's changing attitudes toward development and preservation in the decades following World War II.

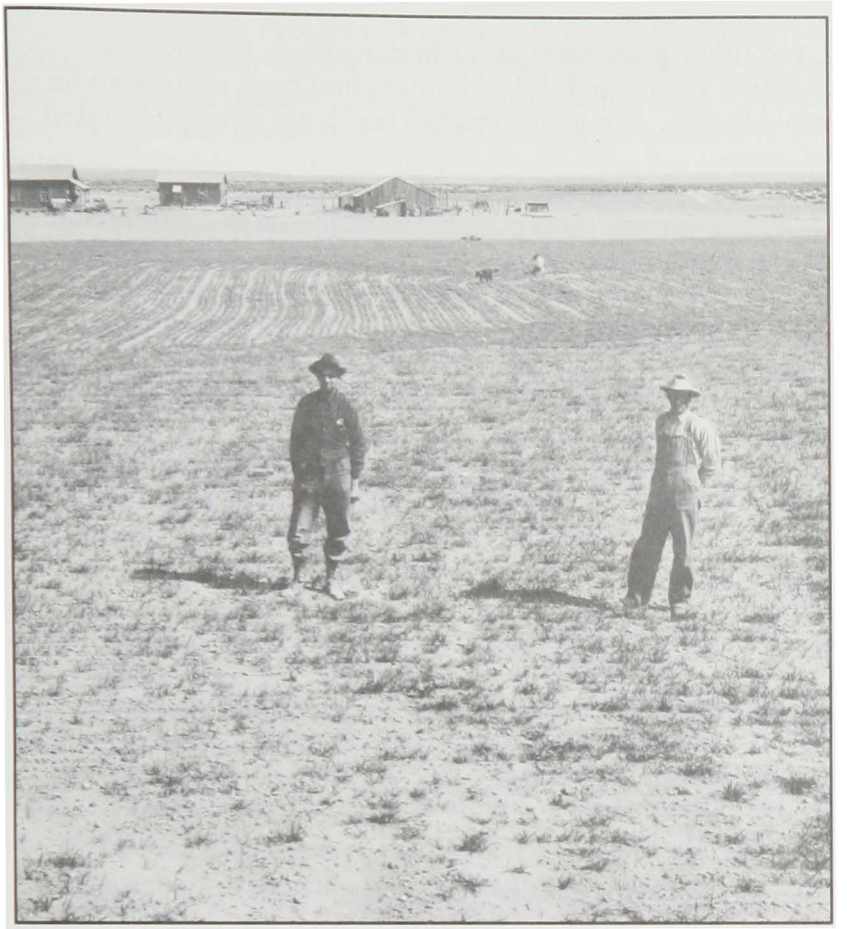
At first the fish seemed so numerous few people worried about them. There is no indication that conservationists uttered any alarming cries as developers proposed a dam at Five Mile Rapids near Pasco more than half–a–century before Ice Harbor Dam came to occupy that spot.

Old timers used to tell the story of an unsuspecting passenger on a Northern Pacific train stepping into the Pasco depot during a brief stopover. Local real estate dealers made a habit of descending upon the station when the trains came in, pitching their sales speeches to unwary passengers. One agent approached this particular traveler, extolling the potential virtues of Pasco. "All this place needs for success and prosperity is good people and water," he bragged. Replied the passenger: "Well, that is all that Hell needs". [2]

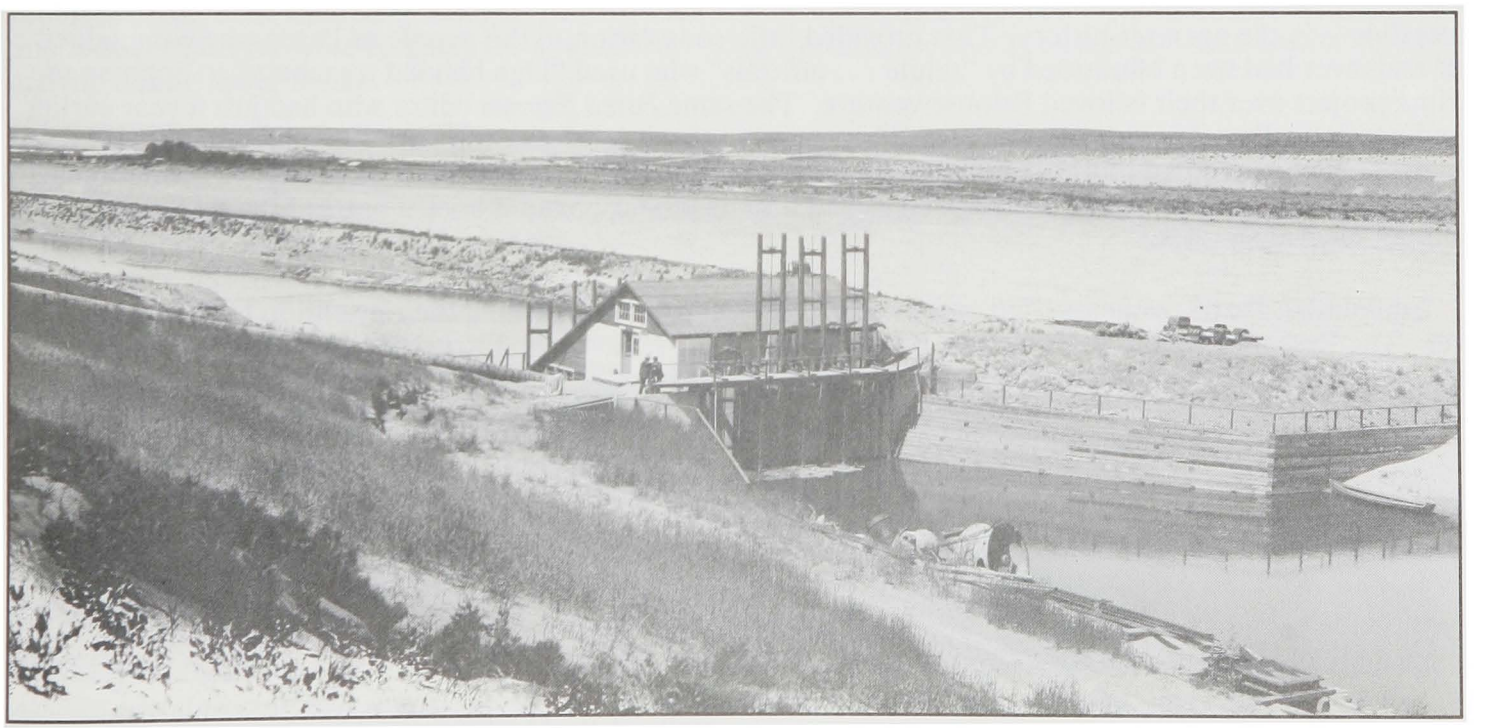
Still, the businessman did not exaggerate. Pasco did need only those two commodities, and of the two, water was more important. Some farsighted individuals grasped the area's potential very early. Penned a local newspaper writer in 1889:

> *The soil, according to scientific investigations, is the grandest ever issued from the volcanic eruptions or produced by Mother Nature. It will, from a little flowing perspiration from a well bucket or an irrigation canal, grow anything but gun powder and will lend assistance to doing that!* [3]

William Gray and Louis Frey held that same optimistic perspective when they formed the Pasco Land Company in the 1890s. The two traveled east in 1892, establishing a headquarters in Chicago with offices in New York, Massachusetts, and Ohio. Advertising Pasco as the next great Western boom town, their brochures carried the slogan, "Keep Your Eye on Pasco." On paper they made a lot of money, but no one actually invested much cash when signing their contracts. The Depression of 1893 erased any potential profits, and the Pasco Land Company went bankrupt. [4]



Pasco area residents tried dry land farming while awaiting irrigation.



Snake River irrigation project pumphouse near Pasco, 1909.

Although the great expectations of Gray, Frey, and other promoters never materialized, Pasco grew steadily: 200 people in 1900; 2,083 in 1910; nearly 4,000 in 1914. And the promoters had been correct about one thing: bring water to this sandy desert and it would bloom. For years, Pasco's residents struggled to find a way to water crops from the ample flows of nearby rivers.

It would seem relatively simple to irrigate the region, since the city sat virtually at the junction of two of the West's greatest rivers, the Columbia and the Snake. But the good farm lands lay well above the streams. Pumping water uphill proved a major obstacle. So most early Pascoans staked their hopes on a grandiose scheme to transfer water from the Palouse River, more than 70 miles away, through a system of irrigation canals, flumes, and reservoirs. In 1893, a force of 200 men and dozens of horses, paid by the Palouse Irrigation Ditch Company, began excavating. But the Depression that year abruptly terminated the work. [5]

Eastern financiers revitalized the Palouse project in 1897, and in 1899, a leading historian of Western irrigation called the enterprise "the principal [irrigation] project now under way in Washington." But after three years of heavy construction costs, the corporation again abandoned its scheme. Palouse River water still had not made its way to Pasco.

Another group of local residents reorganized in 1904, buoyed by the passage of the Newlands Act in 1902 and the formation of the Reclamation Service, forerunner of the Bureau of Reclamation. If private enterprise could not divert Palouse water to Pasco, surely the federal government could. The arrival of government engineers set off wild speculation that Pasco's desert would finally receive irrigation. For nearly two years, as many as 40 engineers studied the problem of building a dam on the Palouse River and transporting water to 100,000 acres in Franklin County. "The lands under the Palouse project will grow . . . semi–tropical products [and] . . . produce $10,000,000 annually," gloated the *Pasco Express*.

By 1906, the Secretary of the Interior seemed ready to approve the Palouse Project. Then F.H. Newell, chief of the Reclamation Service, claimed it would be too expensive. The Service would instead irrigate 450,000 acres in the Yakima Valley, a project destined to become one of the largest––and most successful––in the agency's history. That provided little consolation to the people of Pasco who complained their endeavor had been blindsided by "senile . . . officials" who used "high handed treachery" to approve the Yakima project over their beloved Palouse venture. The same *Pasco Express* editor who had just a year earlier waxed poetic on Pasco's potential now vented his anger on the federal government: "The history of the Palouse project is a record of a villainous tragedy, for no fairer child was ever born under the Reclamation act of Congress. Yet the wet nurses in charge strangled it in its infancy. Had it been a bastard the treatment could not have been worse."

Undaunted, Pasco residents tried other ways to obtain irrigation, turning their attention to the Snake River. The Pasco Reclamation Company, incorporated in 1909, envisioned irrigating 10,000 acres from the Snake, using water–powered turbines to pump water into a reservoir two–and–one–half miles long, and then diverting the water into wooden pipes. They built the pump house, reservoir, and pipes, but soon abandoned the project, again because of high costs. [6]

Two other endeavors, not much more successful, also focused on the Snake. Both envisioned an irrigation dam at Five Mile Rapids that could also take advantage of the strong current to produce power. Both would have been built at precisely the location the Corps of Engineers eventually constructed Ice Harbor Dam.

The Burbank Project was another privately capitalized venture that started optimistically but eventually failed. A pump on the south bank of the Snake forced water uphill, at one time irrigating nearly 5,000 acres. But not enough landowners enrolled to pay the bills. In addition, by the 1920s, water levels at Five Mile Rapids declined drastically during the summer because large irrigation projects in Idaho diverted a considerable amount of the Snake's flow. In order to salvage the Burbank Project, Pasco residents began constructing a wing dam to raise the water high enough to once again enter the project's canal. With the dam nearly completed, a surge of water roared down the Snake, washing it away. The Burbank Project stumbled along for a few more years, but eventually dried up--literally and financially. [7]

A much grander plan for Five Mile Rapids called for state and federal assistance. In 1907, the Benton Water Company proposed a dam across the Snake, an idea the Pasco Commercial Club promptly endorsed. Such a dam would "greatly improve" the Snake as "a national water highway" the Club predicted, and at the same time provide water for irrigation and power. Both the House and Senate passed a bill permitting dam construction in 1908, but it was pocket-vetoed by President Theodore Roosevelt, a persistent champion of multipurpose water development. The Five Mile dam did not meet his standards.

Interest in the project faded for several years, but reappeared in 1916 when respected engineer E.G. Hopson of Portland produced a report for the Pasco Chamber of Commerce, successor to the Commercial Club. Hopson wrote that "there appears to be quite a favorable possibility of development on a large scale" at the site, claiming water backed by the dam could irrigate nearly 75,000 acres. The dam would also improve navigation by eliminating one of the Snake's most treacherous rapids, and it would create power. Hopson's proposal won the endorsement not only of Pasco-area irrigationists but also that of open river advocates who saw it as an important step in the long goal of creating a navigable channel to Lewiston.

The Five Mile project languished during World War I, but boosters began promoting it again shortly after the Armistice. Both the State of Washington and the U.S. Reclamation Service made investigations, but neither study brought the results boosters hoped. The Reclamation Service, recently criticized for hastily approving two ill-advised projects in the Pacific Northwest, was not about to move quickly into another problem area. So it studied thoroughly, and in 1926 issued a pessimistic report: "Further improvements on Snake River [at Five Mile Rapids] are unjustified." That document virtually ended all Reclamation Service activity on the lower Snake.

Although most of the Pasco basin received irrigation water from the Columbia Basin Project, several thousand acres adjacent to the lower Snake got irrigation water fron the reservoir behind Ice Harbor Dam.

When people began seriously considering federal improvements to the lower river again in the 1930s they almost always mentioned them in conjunction with a different dam–building agency, the Army Corps of Engineers. And each Corps' proposal for a series of dams––whether four, six, or ten––to bring slackwater to Lewiston included construction at the important Five Mile site. Eventually, the Corps did build its dam there. And eventually the Burbank/Pasco area benefitted from increased water for crops. But the two projects were not closely tied, as it turned out. Ice Harbor's irrigation proved negligible compared with its hydroelectric and navigation benefits. The Pasco desert bloomed in the 1950s and 1960s, primarily from waters diverted from the Grand Coulee/Columbia Basin project, not from the nearby Snake. Even so, irrigation boosters were the first to envision a dam at the big rapids near the river's mouth, a dam the federal government eventually built. [8]

The Columbia/Snake system is home to several varieties of anadromous fish––those that migrate from fresh water to the ocean, returning when mature to breed in their native streams. There are steelhead, shad, smelt, and several species of salmon. Steelhead and salmon are the prizes. They are similar in some of their anadromous ways, but have one important difference: salmon always die after spawning, while steelhead may live to repeat their arduous cycle.

And the lifecycle truly is arduous. An adult female salmon may lay 2,000 to 5,000 eggs in gravel beds. The male then fertilizes the mass before both fish die. The eggs live in gravel about 50 days before hatching into alevins, embryonic fish that feed on their yolk sacs. These quickly grow into fry, eating organic matter drifting downstream. Within a few months they are fingerlings several inches long. Up to 18 months can pass before the young fish are ready for their downstream journey to the sea, which usually begins in spring when the streams run fast. During this period they undergo smoltification, a physiological transformation enabling them to adapt to saltwater.

The smolts, now biologically programmed to migrate to the ocean, might travel more than 1,000 miles down freshwater streams. They spend some time close to the seashore, but eventually move to open waters where they may swim 4,000 miles a year. After one to five years the fish return to the river that first transported them to seawater, fighting their way upstream to spawn within a few feet of their birthplace.

These anadromous fish invariably return to their birth waters. They will exhaust themselves and die attempting to surmount a barrier to their home rather than enter another similar, unblocked stream. Placing a dam in the water with no provision for fish passage eliminates the migratory pattern. The complete obstruction of the lower Columbia at Bonneville, for example, would have terminated all fish runs in the Columbia and its tributaries above that point, including the Snake.

Some people criticized the "callous" attitude of early Pacific Northwest Army Engineers toward the preservation of anadromous fish runs. Specifically, they claimed the Corps did not seek fish passage facilities at Bonneville Dam; that only after unrelenting public pressure did the Engineers compromise. Actually, these critics were largely incorrect. [9]

The Corps, well aware of migratory fish problems before the federal government authorized construction at Bonneville, had already installed fish passage facilities at projects on the Willamette River and at Ballard Locks in Seattle. As the agency began surveying the Columbia system for potential dam sites in the 1920s, Division Engineer Colonel Gustave Lukesh wrote, "In connection with tentative design of dams for Columbia River and certain tributaries it appears that provision should be made for the passage upstream of fish, especially salmon, migrating to breeding places." Nearly a year before the federal government authorized Bonneville in 1933, Portland District Engineer Major Oscar Kuentz emphasized that "studies must be made to determine the best method of passing the salmon over the [proposed] high structure." [10]

Critics contend that the Corps originally designed Bonneville without fish ladders and later added them after public outcry. But in fact the Corps' initial design, submitted to Congress in 1933, included fish passage facilities. Facing pressure from the federal government to get unemployed people quickly to work at Bonneville, the Corps was unable to develop detailed plans for fish passage. But the original budget did include $640,000 for fishways. True, fish passage, once the Engineers completed final planning, eventually cost over $7 million. The Corps added a lot to the original plans, and many additions came as a result of public concern, particularly from Columbia River commercial fishing interests. Forced to act quickly during the project's initial planning stages, the Corps subsequently worked cooperatively with state and federal fishery agencies and commercial fishers, funding significant research studies. Once this research determined the need for more comprehensive fish passage systems, the Engineers agreed to expand their original concepts. [11]

Bonneville, at first, seemed a success. The Department of Interior noted that salmon climbed the fish ladders with "far less effort than their forebearers that fought upstream through the swirling rapids that are now buried beneath fifty feet of water." The Oregon Fish Commission considered the operation "entirely successful." [12]

But even in the midst of this success, there were those who remained concerned. All Bonneville proved, after all, was that upstream and downstream fish could pass over one large dam. While praising Bonneville's success, the Interior Department's Bureau of Fisheries also warned that the cumulative effects of more dams might doom anadromous fish. As early as 1938, biologists realized some fish died attempting to clear the dam. Later studies would show dam mortality rates for downstream migrants to be as high as fifteen percent. Lose that many fish at each dam, and the string of federal projects proposed from Bonneville to Lewiston could eliminate the anadromous fishery of the Snake. Fishery people could accept Bonneville, but they were skeptical about other dams. They would fight to prevent obstructions on the lower Snake, gateway to some of the most significant salmon and steelhead spawning grounds in America. [13]

Concerns about the effect of lower Snake projects on fish first surfaced at a public hearing in Lewiston in 1937. With one exception, speakers unanimously endorsed a Corps of Engineers plan to dam the Snake and create a navigable waterway. V.E. Bennington, a member of the Washington State Game Commission, chose not to directly oppose the dams, but believed the Corps proposed an insufficient amount of money for fish passage.

Bennington found no allies during the hearing, but in private conversations following the meeting he made a significant convert. He warned representatives of the IEWA that they could expect a "considerable fight" from both commercial and game fishing interests unless the Association worked to secure more funding for fish passage facilities. The IEWA quickly passed a resolution calling upon the Corps to request money for the same level of fish conservation at Snake River dams as it had at Bonneville. [14]

The alliance between fishery agencies and the IEWA was short–lived as the agencies became more strident in fighting the lower Snake dams. In 1945, The Dalles Chamber of Commerce, an IEWA member, urged the Association to "adopt measures to effectively combat" the "highly organized" opposition to Snake River dams by fish and wildlife agencies. "These agencies are going out of bound," the Chamber claimed, "and we contend that in some activities they are exceeding their authority." [15]

Even the Corps' Assistant Chief of Engineers Thomas Robins, a man sympathetic to fishery concerns while on duty in the Pacific Northwest, grew exasperated with the increasing animosity of fishery advocates toward additional dams. Testifying before Congress in 1941, he noted that Bonneville's fishways were eminently successful and that no reason existed to believe fish could not safely pass in both directions over Snake River dams fitted with similar facilities. The dams' turbines were "absolutely incapable of hurting the fish. If you could put a mule through there, and keep him from drowning he would go through without being hurt. Before we put the wheels in, we carried on experiments with fish, and proved conclusively that the pressure of the turbines will not injure fish." It was a broad statement. Actually, the turbines at Bonneville did kill fish, and researchers found that dams created other difficulties. Still, Robins' comment provided fuel for advocacy groups like the IEWA. In later years, the Association frequently repeated the assertion of turbines being harmless to fish. Ignoring other difficulties dams caused, the IEWA concluded that the obstructions therefore posed no serious cumulative effects. More important, in the 1940s, members of Congress came to believe the idea that if turbines were safe, dams were too. Indeed, Representative John Rankin of Mississippi seemed to speak for the entire House Committee on Rivers and Harbors when, during Robins' testimony, he referred to the attacks by fishery people as "propaganda." [16]

While fishery agencies and some commercial fishing organizations attempted to scuttle authorization of the lower Snake projects, they entered the fray too late to effectively combat organizations like the IEWA that had advocated a series of dams for years. Besides, in the 1940s, most people viewed river development as a national asset, not an environmental liability. When Congress authorized the projects in 1945, conservationists changed their tactics. Unable to block authorization, they attempted to convince Congress to withhold construction funds. They drew their line at Ice Harbor, not only because it was the first dam the Corps proposed to build on the Snake, but also because they believed if they could stop Ice Harbor, Congress would never agree to construct the other three projects upstream. Facing growing evidence about the harmful cumulative effects of dams, many fishery officials in the 1940s came to believe that four dams on the lower Snake would destroy the anadromous fishery of the Columbia's major tributary.

In 1947, the Interior Department proposed a ten–year moratorium on dam construction on the lower Snake and Columbia. This would allow fishery experts time to study fish needs. The Department, cognizant of power requirements in the region, claimed the Bonneville Power Administration could obtain additional electricity if power–producing agencies constructed dams elsewhere, in places less harmful to fish than those on the lower Snake. Still, the Department concluded, if it proved essential to harness the lower Snake's power, the "salmon run must if necessary be sacrificed." Rather than attempting to halt all dam construction, the Department proposed its moratorium as a way of providing time to investigate the best ways for mitigating losses the dams would cause: "The Government's efforts should be directed toward ameliorating the impact of this development upon the injured interests and not toward a vain attempt to hold still the hands of the clock." [17]

The IEWA and other development interests opposed the ten-year freeze, as did the Corps of Engineers, which viewed the work stoppage as detrimental to its careful plans for orderly river development. The Corps believed Bonneville's success proved it possible to pass fish in numbers large enough to insure the preservation of runs, and it did not agree that the cumulative impact of additional dams would bring disaster. "Although the conditions at Bonneville Dam and at the Snake River Dams may be dissimilar in some features," wrote Portland's District Engineer in 1947, "in view of the experience of the functioning fish facilities at Bonneville Dam, this office still is of the opinion that the Snake River Dams will not eliminate the runs of migratory fish on that stream." [18]

The Columbia Basin Interagency Committee (CBIAC) held a public hearing on the proposed moratorium in June 1947, at Walla Walla. More than 200 people attended, with a few more testifying against the moratorium than favored it. Following the meeting, a CBIAC subcommittee interviewed experts on fish, power, irrigation, and flood control and discovered a "plethora of opinion" but a "paucity of fact" surrounding fish migration and the problems dams posed. Even so, in September the CBIAC recommended against the moratorium. Another effort by fishery agencies had failed to halt the lower Snake dams. But the conservationists were not ready to give up.

The case against the dams centered primarily on fish survival, both the highly publicized efforts to get mature fish over the blockages and the much less publicized, but technically more difficult problem of conveying young smolts past them. After the Department of Interior's 1947 moratorium failed, it fell to state fishery agencies to pursue the case against lower Snake dams, assisted by commercial fishing businesses, and, to a lesser extent, sports fishing groups.

From the beginning, these groups centered their arguments on the cumulative damages dams might cause. In 1951, the Oregon Fish Commission estimated that of one million juveniles approaching Lower Granite Dam, the furthest upstream of the four planned along the Snake, only 316,000 would live to see the downstream side of Ice Harbor. They would then face four more dams on the Columbia before entering the ocean. That estimate of 25 percent killed of those arriving at each dam eventually proved to be high, but the Commission had made a strong and graphic case. In addition, upstream migrants could expect problems, too. Some might not be able to negotiate all eight dams, and if they did, they could find that reservoirs had flooded many of their best spawning beds. Summarizing the case against the dams, the Director of Washington's Department of Fisheries wrote Congress: "The future of the Columbia River salmon industry, the second greatest renewable resource of the Pacific Northwest, hangs in the balance over the decision of Congress regarding the appropriation of funds for Ice Harbor Dam." [19]

Fishery people knew they would have a difficult time because the post-war Pacific Northwest required significant new blocks of energy. Much of that power would have to come from hydropower sources. Dam opponents would have to step gingerly, but they believed they could convince Congress that power could be obtained without jeopardizing Columbia and Snake river fish runs.

Congress agreed to authorize the projects only because of their potential to produce power. Indeed, by 1948, the Corps of Engineers projected that 82.5 percent of the four-dam project's benefits would come from power with only 15 percent from navigation and the remaining 2.5 percent from irrigation, flood control, and recreation. These were multipurpose dams, but one purpose predominated. When the issue became one of building dams whose primary benefits were power rather than navigation, the fishery interests had a foot in the door. The Corps obviously needed to build dams at specific lower Snake locations if the primary objective was getting barges to Lewiston. But fishery agencies asserted there were many other potential locations for hydroelectric dams. They would eventually lose their case precisely because of the power issue, but for nearly a decade the expanded debate over the need for power from these particular lower Snake dams enabled fishery people to force continual construction delays. [20]

"There are 387 dam sites that are undeveloped in the Columbia River basin," wrote the Director of the Washington Department of Fisheries in 1951. "These sites are capable of producing between thirty and fifty million kilowatts of hydro–electric power. Among these sites only a minority . . . are objectionable from a fisheries standpoint." To fishery agencies, the logic was clear: build other less–damaging dams before blocking fish on the Snake. Not only could alternative dams produce more electricity, but also, by calculating a potential $9 million annual loss because of depleted or exterminated fish runs, the lower Snake dams would, in the opinion of the Washington Fisheries Department, "create some of the most expensive electricity in the United States." [21]

As alternatives to lower Snake dams, opponents proposed to first develop maximum generating capacity at Grand Coulee and Bonneville, then build projects on the upper Columbia and its tributaries, where Grand Coulee had already obliterated fish runs. As dam opponents noted, these two measures would produce more hydroelectricity than all the lower Snake dams combined. Finally, if Snake River development proved necessary to meet increasing power needs, fishery advocates urged that the government first dam Hells Canyon and other locations upstream, preserving the lower Snake and entrances to the important Clearwater and Salmon river spawning grounds. The debate over damming Hells Canyon would eventually pit conservationists against developers in one of the nation's longest and most significant environmental battles. It is interesting to note that in the early skirmishes not all conservationists opposed dams in the nation's deepest river gorge––at least not if building in Hells Canyon would preserve the lower Snake as a free–flowing river. [22]

State fishery agencies took their case directly to the people and to Congress. Accused by dam proponents of overstepping boundaries by lobbying, lobbying is nonetheless precisely what they did, and they were not shy about it. "All too often in the past fishery management agencies have suddenly been presented with an approved major dam project and told that they were, in the shortest time possible, to design and devise fish passage facilities," a frustrated John Biggs, Director of the Washington Department of Game, wrote. "In the past, the fisheries scientists of this Department have maintained an absolutely non–partisan position with regard to the political aspects of the development of the Columbia River," stated John Hurley of Washington's Department of Fisheries. At Ice Harbor they determined to take a different approach. [23]

The Washington Departments of Fisheries and Game and the Oregon Fish Commission and Oregon Game Commission all took active roles. They testified before Congress, providing scientific information. But they had done that before. This time they also specifically spoke out against dams, and they did not "leave a rock unturned in getting the proper information to the right people at the proper time." [24]

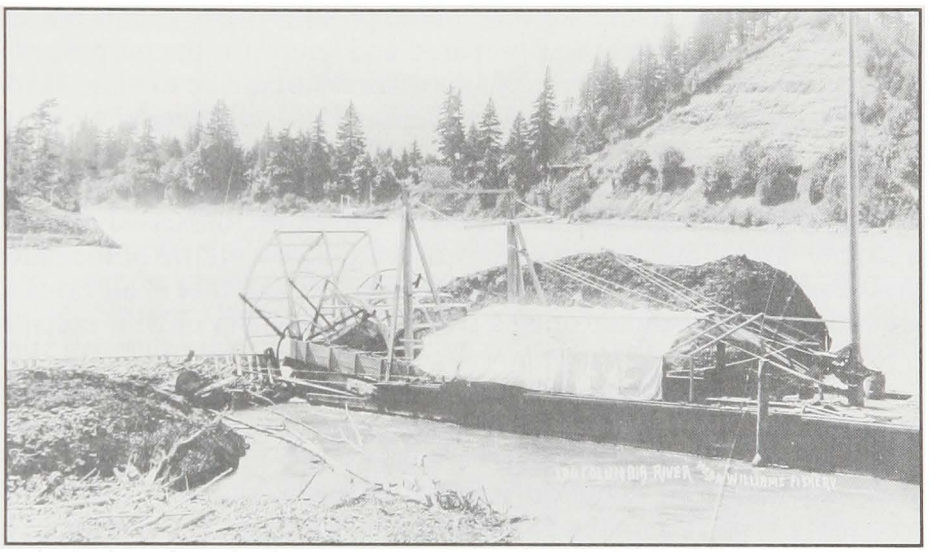
The agencies lobbied Congressional representatives they believed sympathetic to their cause. To further increase pressure, the Washington Department of Fisheries supplied Seattle newspapers with information noting their side of the case; it sent telegrams opposing the dams during times when Congressional committees considered appropriations bills; and, in an unusual letter headed "as the most important that the Department of Fisheries has ever addressed to you," it requested sports fishermen to urge Congressional representatives to defeat the "fish–killing dam" at Ice Harbor. [25]

It was an aggressive campaign, and it put Herb West and the IEWA on the defensive. The IEWA had occasionally found it necessary to counteract arguments of the few who opposed lower Snake dams, especially railroads. But opposition had never before been as loud, organized, or broad–based. This required renewed dedication.

Herbert West and the IEWA probably believed they, too, were fighting to preserve fish. After all, the Association effectively supported increased appropriations for lower Snake fish passage devices. The difference between the IEWA and fishery interests was that the Association remained convinced it was possible to have fish and a developed river, too; or, more pessimistically, if one or the other had to be sacrificed, better it be fish than development.

West and the IEWA first argued that dams did not harm fish. Ignoring concerns about cumulative impacts of dams, West emphasized what some had said about Bonneville in the 1930s: by smoothing rapids, dams actually eased upstream journeys. As for downstream migrants, West assured politicians that "with modern turbines, the fingerlings are not chopped to bits, nor do the salmon break apart from water pressure." While technically true, his testimony ignored numerous other difficulties these juveniles faced in getting downstream to the ocean past an increasing series of obstacles. Despite West's assertions, the House of Representatives continuously denied funding to start construction at Ice Harbor, partially because some representatives remained concerned about fish passage. Frustrated in his efforts to persuade Congress, West tried a different tactic: he unilaterally declared victory. He testified to Congress that recent tests had shown fish could be passed over dams "without irreparable damage to the Columbia River fishery resource." Fishery agencies immediately attacked the statement as "erroneous and misleading," claiming it "had no technical basis in fact." [26]

Salmon canneries like this one at Chinook, near the mouth of the Columbia River, provided a great demand for Columbia/Snake salmon.



Fish wheels on the Columbia and Snake rivers had partially depleted anadromous fish runs before the federal government began constructing dams on the rivers, but opponents to Ice Harbor argued the dam would make matters worse for fish.

Having had little luck convincing Congress of the harmlessness of dams, West tried to find other causes for decreased fish runs. His bogeymen were those who fished the rivers. Greedy commercial fishermen and Indians, not dams, shared primary responsibility.

It was an argument with some merit. Beginning with the advent of the Columbia River's commercial canning industry in the 1860s, commercial fishermen had taken a severe toll, as had, to a lesser extent, Indians and sportsmen. However, due to a variety of new laws and seasons, commercial fishers were no longer the primary culprit by the 1930s. They took fish, but runs were much more seriously endangered by loss of habitat due to mining, logging, farming, and other causes. When the dams came, fish faced yet another obstacle, and runs of wild fish began declining. Still, West was not alone in making the case against commercial fish operations. Indeed, commercial fishers became a popular and convenient scapegoat. Officials at the Corps of Engineers' Walla Walla District, for example, were growing impatient in 1955. The Division had formed their office primarily to construct McNary and the four lower Snake dams. McNary was done. If Congress continued to refuse funding for Ice Harbor and the other three Snake projects there might be no reason for the District to continue. The District attempted some persuasion of its own. After a year of studying fish passage at McNary, it announced that results "discount considerably the claims of the fish industries that dams on the river are a hindrance to the anadromous hordes." It further stated that enough fish had eluded the real culprits, the "commercial fishermen's nets and sportsmen's lures," to insure survival. [27]

Reaction came swiftly. The Oregon State Fisheries Director requested that misunderstandings created by the news release be corrected and "steps be taken to avoid the release of such material in the future." The *Astorian Budget* labeled the release as "dangerous . . . propaganda." The Columbia River Salmon and Tuna Packers Association claimed it was "based on such flimsy and inconclusive premises that we cannot avoid the thought that the document was prepared and issued for the purpose of retaliation against the industry because of its opposition to certain projects the district would like to undertake." And Oregon Senator Richard Neuberger, a strong supporter of Ice Harbor Dam, criticized the Corps for its "flagrant partisanship." [28]

The response had an effect. Brigadier General Louis Foote, North Pacific Division Engineer, wrote to Neuberger that he regretted the incident. "To assure ourselves that press releases emanating from our offices are strictly factual and devoid of any objectionable material of the nature referred to," he wrote Colonel Myron Page, Walla Walla District Engineer, "I desire that in all cases all releases issued by your office be reviewed by you personally or by a responsible member of your executive staff." [29]

The Corps would not again be so outspoken during this debate, but as Congress continued to refuse funding for Ice Harbor, Herbert West became even more vocal. "It is high time that the people who are dependent on the fishing industry for their livelihood should stop their blind, unreasoning attacks on progress and development," he wrote the Executive Secretary of the Columbia River Fishermen's Protective Union. He accused Alvin Anderson, Director of the Washington Department of Fisheries, of "a complete lack of understanding of the overall water resource development program, . . . a biased opinion, and a closed mind which is unworthy of one occupying a public position." The Washington Department of Game was "not particularly interested in the fisheries program . . . in the Snake River area; but, rather, [are] permitting themselves to be used as fronts for other groups and organizations opposed to the extension of inland navigation and further hydroelectric power development in the Northwest." [30]

The results of all the lobbying and accusations proved indecisive. It is unclear whether any of this sniping would have eventually convinced Congress one way or another. The decisive factor in getting money released for the Snake River dams--just as it had been the key in getting them authorized--was hydropower. Once again Herbert West, the champion of inland navigation, found himself relying upon power. Once again, he would argue adroitly, for it really did not matter to him why the dams got built, just so long as they did.

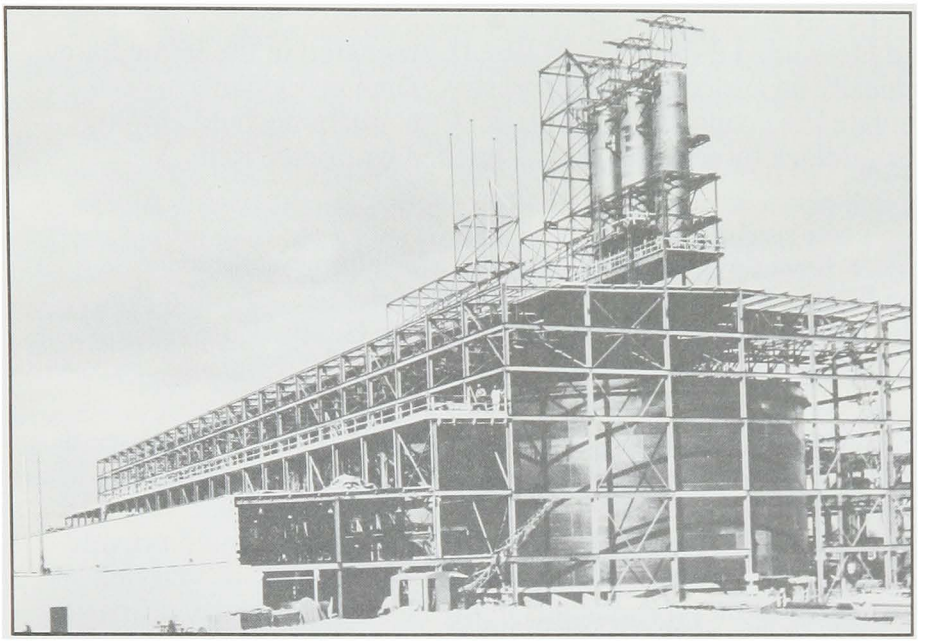
The Pacific Northwest economy, which had blossomed during World War II, stagnated in the immediate post–war years. The region still relied economically on agriculture and forestry. Dam proponents argued that building the lower Snake dams would stimulate the economy in two ways. Construction would employ people, and dams would break the area's power gridlock by creating much–needed hydroelectricity, encouraging more diverse industry. [31]

Those were old arguments, going back to New Deal days, and it is doubtful they alone would have convinced Congress to appropriate construction funds. But in the 1950s, dam advocates also pleaded the cause of national defense, specifically noting the immense power needs of the Atomic Energy Commission's Hanford Operations, located near the proposed Ice Harbor Dam.

A presidential report in 1951 outlined a need for four to four–and–one–half million more kilowatts of power to meet critical national defense programs in atomic energy, chemical production, and the manufacture of aluminum and other metals. The IEWA noted in a slick publication titled *Power for Defense* that completing just three dams in the Northwest––Ice Harbor, The Dalles, and Hells Canyon––could provide nearly half of these national power needs. The Pacific Northwest Public Power Association supported this view: "The heart of atomic energy production and aluminum production is in the Northwest. Here, primarily, is the resource in water from which the nation must strengthen itself for defense." [32]

The Atomic Energy Commission aided the cause. In 1950, Hanford's manager wrote Washington Senator Warren Magnuson of his concern that the Bonneville Power Administration, facing increasing power requests and no immediate new supplies, could not meet Hanford's growing needs. He suggested Ice Harbor could serve as the Atomic Energy Commission's exclusive and separate power source. That idea failed, but the Atomic Energy Commission kept up the pressure. In 1952, the agency wrote Magnuson that negotiations with Bonneville Power Administration indicated a critical upcoming power shortage, just when Hanford would require vast amounts of additional energy to meet the needs of its enlarged facilities. "It does appear to us," the agency noted, "that the proximity of the Ice Harbor Dam to our Hanford Works would be a feasible and sound means of strengthening the Bonneville system so that they would have added system capacity to enable them to supply Hanford with its increased requirement." [33]

The fishery interests counter–attacked. "Any Pacific Northwest power shortage that exists now is not the product of the salmon problem," wrote Robert Schoettler, Director of the Washington Department of Fisheries, "but a result of the power agencies failing to develop non–controversial sites while ignoring the pleas of the fisheries people and the general public." [34]



Ice Harbor proponents in the early 1950s pointed to the increased energy needs at the nearby Hanford Engineering Works as a reason to construct the dam.

But it was hard to argue against national defense, particularly at a time when the nation was at war in Korea. The power issue had enabled fishery agencies to expand their arguments in the 1940s. Once it became clear the primary purpose of the Snake River dams was power and not navigation, fishery agencies could legitimately point to many other sites in the region where federal agencies and power companies could build dams that would generate more electricity. But ultimately the power issue defeated them. In hindsight, it seems the fishery people were doomed from the beginning. The newsletters and correspondence of the IEWA reveal the firmness of their resolve, their absolute conviction that their cause was just. They never doubted their eventual victory.

Such confidence is missing in the writings of the fishery people. From the start they were defeatists. The best they hoped for was delay. Their pessimism began in the 1940s, when the Department of Interior, advocating the ten-year moratorium, admitted that "the present salmon run must if necessary be sacrificed." The Washington Department of Fisheries frequently reflected a similar attitude in later years. "We recommend building of upriver dams first, thereby saving our second greatest renewable resource until its sacrifice is actually required by the over-all economy of the region," the agency telegraphed Congress. Another time it wrote that it was a "mandate [of] the Department of Fisheries ... to preserve the fisheries resources of the Columbia River as long as is economically possible." According to Ray Oligher, who became a fisheries biologist with the Walla Walla District in 1954, the state fish agencies' official stance was that "only over our dead bodies would there be dams on the lower Snake." But, in reality, they never believed they had a chance to permanently halt lower Snake development. [35]

As it turned out, the fishery agencies obtained almost all they had originally sought. By the time the political wrangling over Ice Harbor concluded, the debate had taken nearly ten years, the length of time originally proposed for a moratorium in 1947. During that time, the agencies undertook many of the tests they had advocated when first proposing a moratorium. The Corps of Engineers also helped to allay their fears. It hired as a consultant Milo Bell, one of the nation's recognized fish passage experts and something of a folk hero to fishery biologists, to help design the Ice Harbor fish ladders. Bell, along with Harlan Holmes, had read all they could about fish ladders in the 1930s when the Corps hired them to design Bonneville's fish ladders. But the literature was scant. "We knew virtually nothing about ladders," remembered Oligher. "To a lot of people's surprise, the Bonneville ladders worked well." Holmes and Bell then designed the ladders at McNary, and the Corps hired Bell to design the adult fish passage system at Ice Harbor, much to the gratification of fishery agencies. The Engineers also made models of fish passage devices at Ice Harbor, invited fishery agencies to critique them, then redesigned them to meet biologists' concerns. Once McNary Dam went on line in 1954, the Corps cooperated with state agencies in testing that dam's fish passage capabilities, promising to apply lessons learned there to the lower Snake projects. One of the lessons learned came from observing that, despite earlier Corps' statements that even mules could pass safely through turbines, the turbines at Bonneville and McNary did kill substantial numbers of juvenile fish. The pressure gradient over the turbine blades was so high that water literally vaporized, causing localized areas of severe negative pressure in an environment of high positive pressures. Migrating juvenile fish in these areas were subject to severe injury. So research at McNary led to a new turbine design used on the lower Snake dams that created a steady, even flow of water through the blades and also provided more clearance between blades--while efficiently producing electricity. Turbines themselves would not be major problems along the lower Snake, although the Corps would find that the dams created a host of other difficulties for fish. [36]

Despite the fact that fishery agencies received their "moratorium," it did not come primarily because of their political clout. They had had their day. For a few years in the late 1940s and early 1950s, they helped persuade Congress to halt lower Snake construction. But there was always another reason Congress withheld construction funds. Fiscal conservatives, particularly in the House of Representatives, sought to cut federal spending. As the years went on, the debate over Ice Harbor revolved more around budget concerns than fish issues. By 1952, the IEWA, the Corps, and others had probably convinced a majority in Congress that fish could safely pass over dams along the lower Snake. Still, it was another four years before Ice Harbor construction began. The difficulty for dam proponents from 1952 to 1956 was not so much the fishery people. The thorn was a new man in the White House, and a new policy concerning federal dam construction.

Congress did grant a little money to the Corps of Engineers for Ice Harbor: $500,000 in 1946 and $250,000 in 1949, to undertake advance planning and investigations. But the legislature granted no funds for construction. [37]

In 1950, the Corps requested $12 million for Ice Harbor, an appeal President Harry Truman supported. But Congress eliminated the budget item for two reasons: concern over governmental spending and fish runs. President Truman generally favored Ice Harbor, convinced of its ability to produce cost-effective power for defense, especially for the Atomic Energy Commission's increasing needs at Hanford. Most of his budget requests in the early 1950s included a multi-million dollar item to start construction. Although Truman's requests usually made it past the Senate Appropriations Committee, the joint Senate-House conference committee repeatedly rejected them, usually because of fiscal concerns.

In his last budget request to Congress in January 1953, Truman included nearly $5 million for Ice Harbor construction funds, and it finally appeared Congress might agree to spend the money. When President Dwight Eisenhower took office a few weeks later, he proclaimed a policy of "no new starts" for federal multipurpose dams, a policy intended to curb federal spending and encourage local and state governments, as well as private enterprise, to share more costs in river development. He eliminated the Truman Ice Harbor request in his revised budget, and in this honeymoon period between Congress and the White House, Congress granted the President's wish. There would be no money in 1953 for Ice Harbor.

With Eisenhower in office, the task of dam supporters became harder. Now, they not only had to battle a House Appropriations Committee wary of federal dam expenditures; but they would also get little help from the White House.

To people who appreciate the lower Snake dams, Herbert West is a hero, an unflagging advocate of construction. Yet there was another strong ally. It is unlikely the Corps would have built the dams without the equally ardent support of Washington Senator Warren G. Magnuson. Year after year in the 1950s, he carried the Ice Harbor banner into Congressional battle. Year after year, Congress defeated him. After one painful loss a frustrated Magnuson wrote, "It is as if the Congress had taken action which would stop development of oil and gas wells in the Southwest, or coal fields in Pennsylvania or West Virginia. Hydroelectric power represents a source of energy fully as vital as oil, gas or coal." [38]

But Magnuson kept inching closer to victory, kept making converts, and finally his shrewd political maneuvering paid off in 1955. He did not wage a full floor fight that year, not wanting to risk the censure of Eisenhower and his "no new start" Congressional allies. Rather, Magnuson quietly persuaded the Joint Senate–House conference committee to amend the President's budget to include a modest $1 million appropriation to begin Ice Harbor construction. Fishery agencies, in the words of salmon advocate Anthony Netboy, were "caught napping by this parliamentary maneuver." They did not protest, and Congress passed the bill. Eisenhower, unwilling to veto an entire omnibus bill over such a minuscule amount, signed the measure. Magnuson, West, and other dam supporters finally had a foot in the door. As the IEWA proclaimed, "We have broken the log jam with respect to the development of the Snake River, and . . . we should be able to push our program on the Snake River ahead rapidly towards final conclusion." [39]

Senator Warren Magnuson and Herbert West of the Inland Empire Waterway Association were the two most responsible for obtaining congressional appropriations to begin Ice Harbor construction.

Ice Harbor represented the first federal hydroelectric start during the Eisenhower administration. "They're not going to like it but they'll have to take it anyway," a gleeful Magnuson exulted. "Years ago I told a group in Lewiston that one day there would be a Coast Guard station in their community," Magnuson later reminisced. "I think they thought I was a little bit touched." He was a direct descendant of the open river advocates who first had that vision in the 1870s. But, unlike others who had long struggled for the inland waterway, he brought to the task enough political muscle to accomplish the dream. It was a "memorable achievement," editorialized the *Columbia Basin News* in 1957 after the Corps finally began construction. "The supporting cast is very long--and richly deserving of credit--but it is Washington's Warren G. who is entitled to take the solo encore." [40]

The Corps quickly began spending the million dollars, first contracting for an access road to the site. Later, in 1956, the Army awarded a contract for the first-step cofferdam. Harry Drake, who worked at all the projects along the lower Snake and eventually rose to become Chief of the District's Engineering Division, explained the process of diverting the river and building the dams:

> *After you locate where you are going to build the spillway and powerhouse, you enclose an area that will surround all those concrete structures, as well as, usually, the navigation lock. You dig a channel to divert the river, and then you build a cofferdam in the dry area. The cofferdam has steel cells going down to bedrock. There is usually an earthfill part that hooks the shore up to the steel cells. Then you excavate all the dirt under where the concrete structures will go--go right down to bedrock. Usually there is some seepage under the cofferdam and you have to pump it. But with the cofferdam in place you have a dry work area for the several years it takes to complete the concrete structures.*
>
> *You then pick a time when the water is low and take out the cofferdam and run the river through the spillways. Then you build a little cofferdam for the earthfill part of the dam and you rush like hell to get the earthfill portion done while water is low.*
>
> *We were lucky along the lower Snake because there are so many gravel bars. We didn't have to crush rock or haul gravel very far. We mixed our concrete right on the dam sites. At McNary we built a village for dam workers, but we didn't do that along the Snake. We decided workers were willing to travel to those sites.* [41]

More money came from Congress in each succeeding session after 1956. "Dirt really began to fly," in the words of a Walla Walla District news release, in February 1957, when earth-moving equipment started excavating for the dam. Ceremonies attended by Senator Magnuson and other political dignitaries on June 2, 1957, marked the placing of Ice Harbor's first concrete. The officials dropped a piece of parchment in a plastic tube into that cornerstone block. The message read:

> *Here below the surging waters of the Snake River and below the thousands of tons of one of man's largest creations, we place this memorial to you, the far-future generation.*

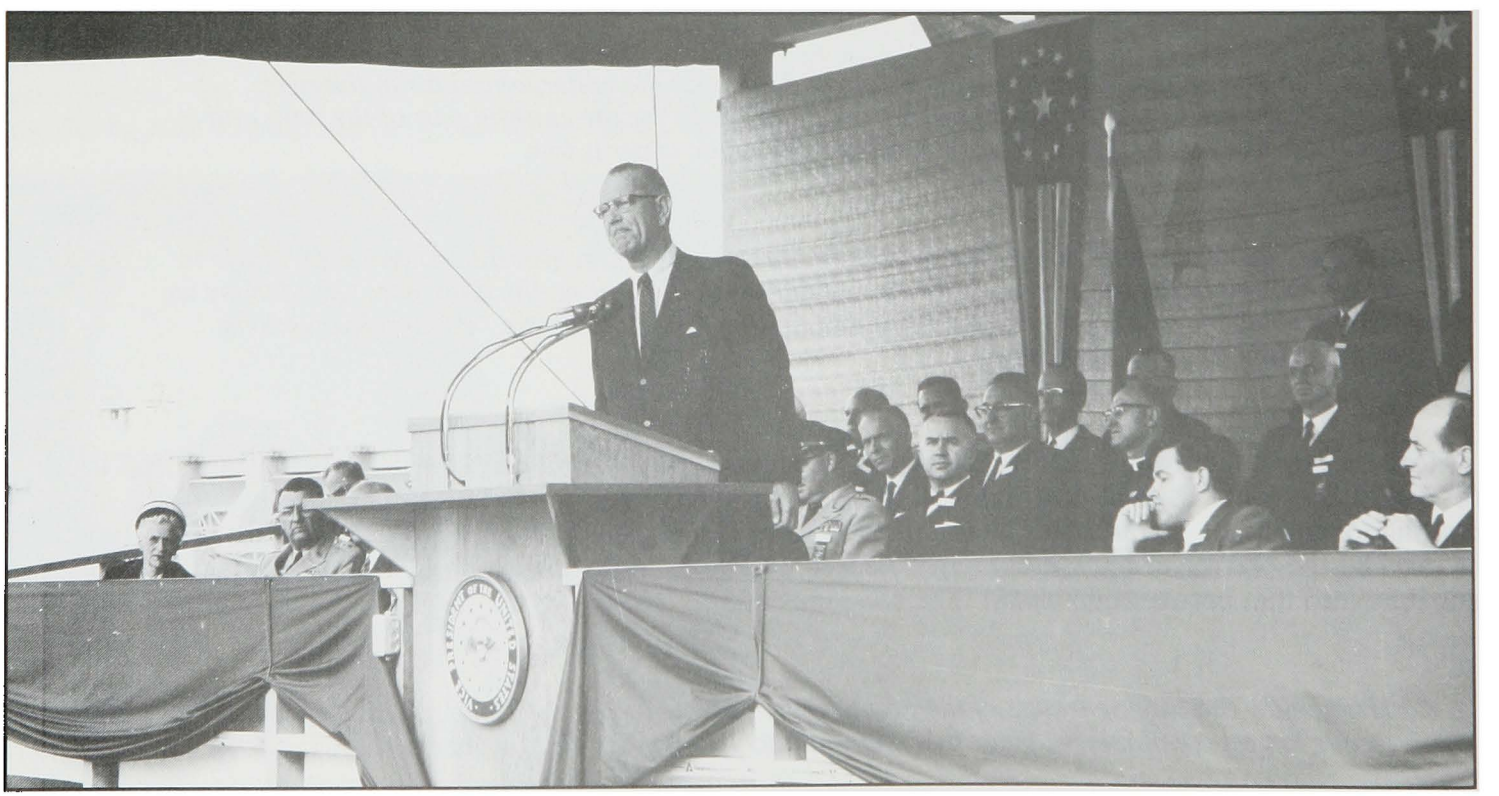
Here, in the early years in the atomic era, the people of the United States exhibit faith in the future by placing the first concrete of a great dam to provide the benefits of peaceful living for the people of our nation.

By the nearness of one of the world's largest atomic energy installations and awareness of the forces of destruction on tap around the world, we humbly pledge our efforts in the peaceful traditions of our great nation, the United States of America.

In November 1961, the Corps began filling the pool behind the dam--named Lake Sacajawea after the only woman in the Lewis and Clark party. The dam generated its first power in December, and in October 1962, Ice Harbor's navigation lock opened.

Workers set 35 million pounds of reinforced steel into place, then covered it with tons of concrete. They excavated over a million cubic yards of rock and dirt. They drilled more than 90 miles of holes in bedrock to blast a solid foundation for the dam. In some places, they blasted and excavated more than 100 feet below the original river bottom. They relocated miles of railroad track, built fish ladders on both sides of the shore, and installed a unique vertical-lift navigation lock gate weighing 700 tons, at the time the world's highest single-lift lock.

When they were done, they had laid across the Columbia's largest tributary a structure 2,700 feet long and 130 feet above the stream's bed. It backed a reservoir 30 miles long, could generate 270,000 kilowatts of electricity, and held empty bays for three additional generator units that the Corps added in the 1970s to strengthen the region's hydroelectric capability.



Vice President Lyndon Johnson at Ice Harbor dedication ceremonies, 1962.

Grape harvester and stemmer crusher at work harvesting concord grapes from grapevines irrigated by water from Ice Harbor pool, 1977.

As Vice President Lyndon Baines Johnson took the podium in May 1962 to dedicate the newest dam on the Columbia River system, it had already submerged Five Mile, Fish Hook, Pine Tree, Haunted House and other rapids, places of turbulence that had slowed the progress and endangered the lives of navigators from Lewis and Clark to Len White. The dam itself sat just below a kidney-shaped bay where intrepid captains used to tie up in spring to allow chunks of ice to flow past. "Ice Harbor" they called it, and the name stuck.

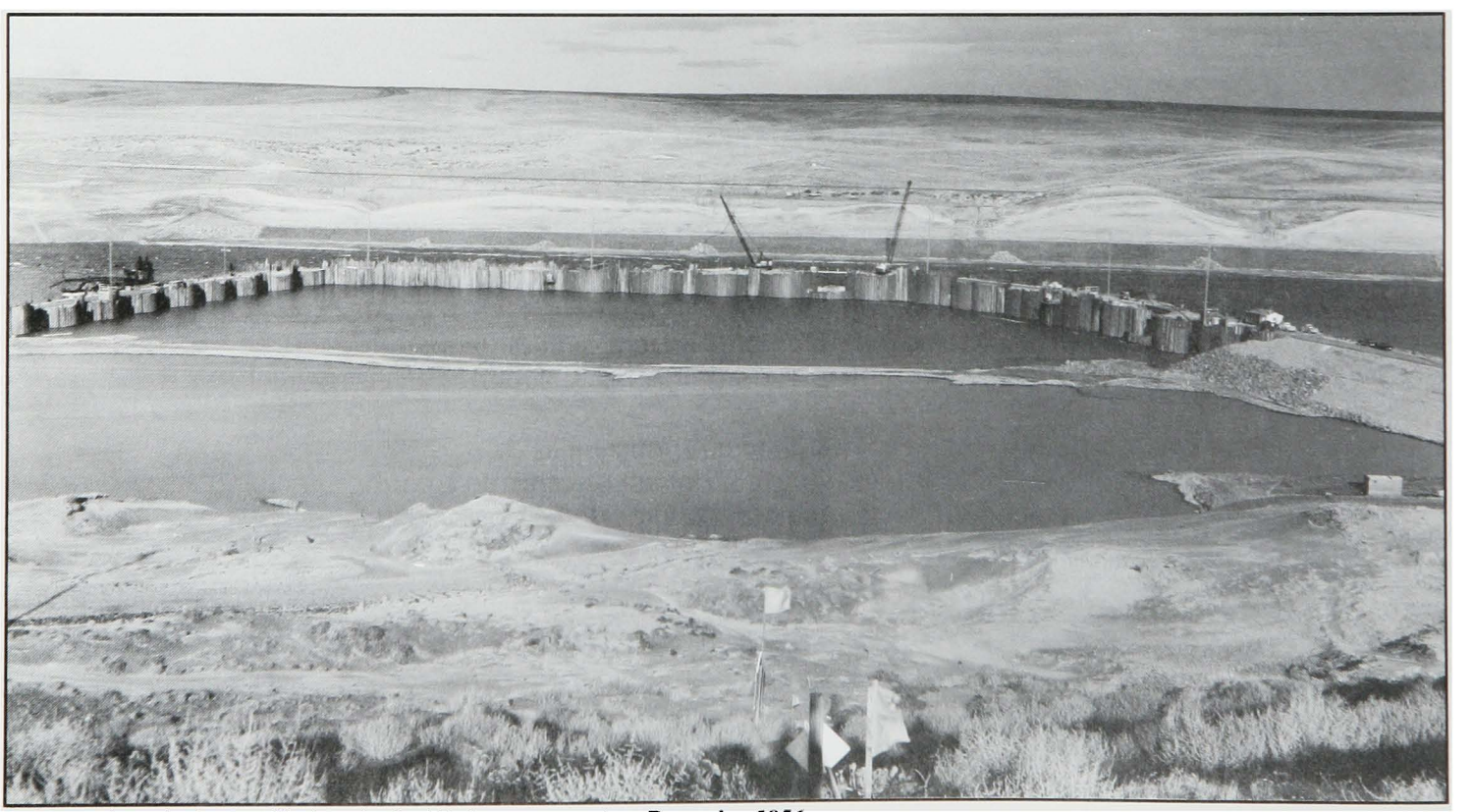
"We have had to fight for every inch of the way so far for our Northwest development," wrote Charles Baker, President of the IEWA during the height of the battle for Ice Harbor. "And apparently, we are going to have to fight down to the last dam." [42]

Baker's words proved to be prophetic. As he stood addressing the genial crowd on that May day in 1962, Lyndon Johnson anticipated the time when the lower Snake would be completely dammed, when no hazardous rapids would remain, and giant turbines would generate thousands of kilowatts of electricity. It was an accurate vision, for the fishery people had been correct: once Ice Harbor was built it would be virtually impossible to halt construction of Lower Monumental, Little Goose, and Lower Granite. Still, Lyndon Johnson could not have predicted it would be another thirteen years before slackwater finally backed up to Lewiston. Federal budget difficulties would delay work, and fishery advocates would make one last stand before allowing the Corps to complete the lower Snake River project. In addition, the Army Engineers would face a litany of changing regulations that would cause delays as the nation grappled with the issue of how to develop rivers to meet growing population demands while preserving some aspects of the natural environment.

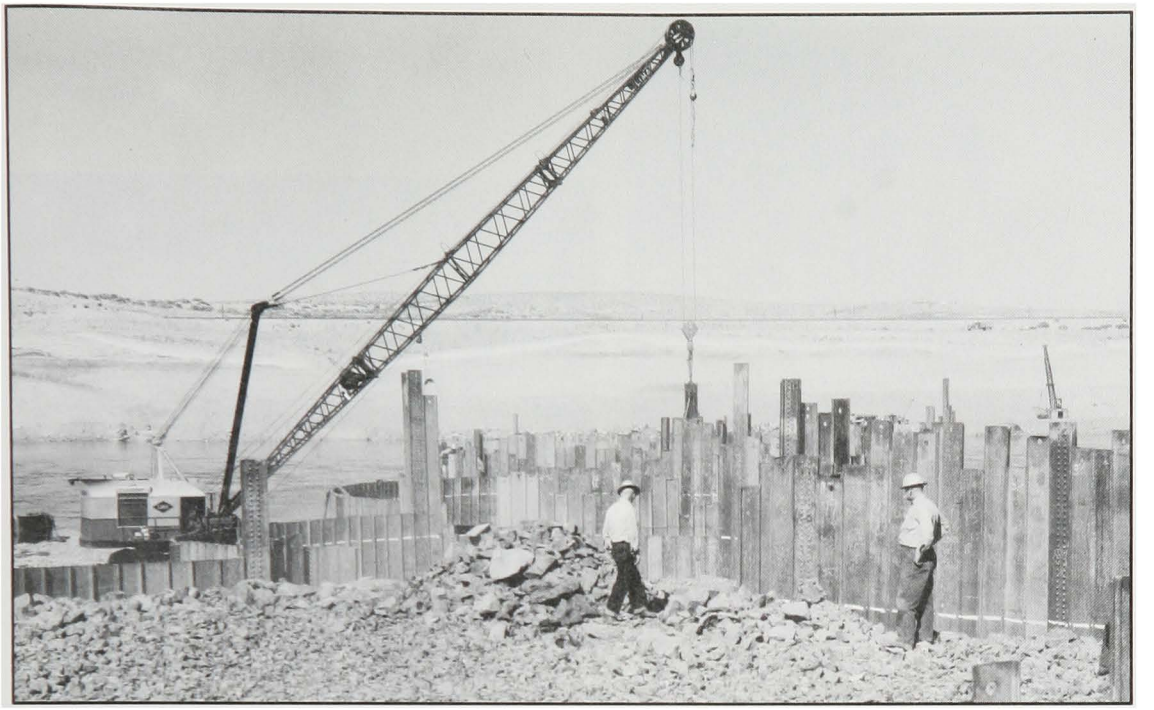
Charles Baker was right. It was going to be a long fight before other dignitaries would mount a podium dedicating completion of the last dam on the lower Snake.

Constructing Ice Harbor Dam

Surveying for access road to Ice Harbor construction site. August 1955.

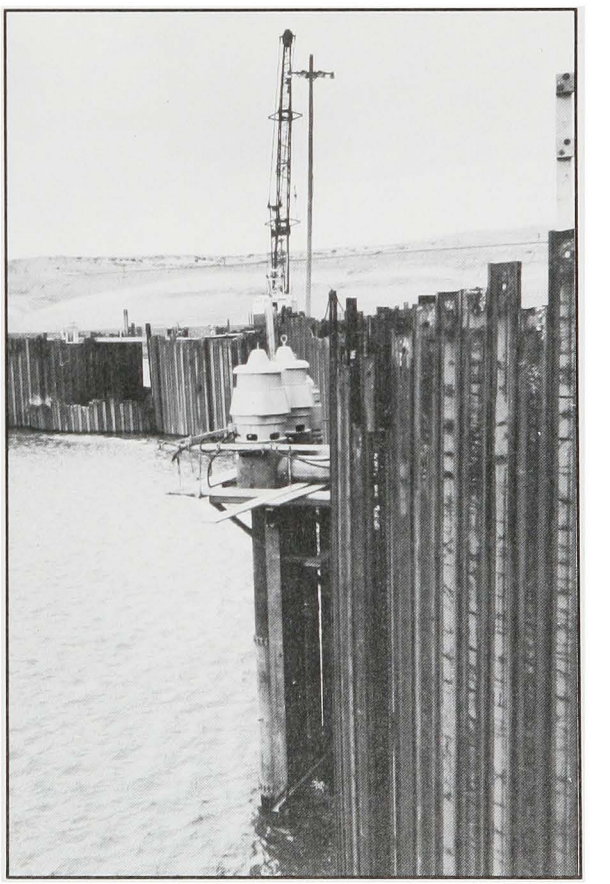


Completed south shore cofferdam for Ice Harbor construction, December 1956.



Placing stone topping in the cofferdam cells, September 1956.

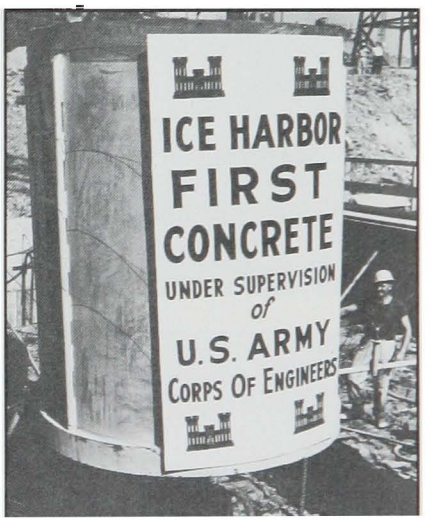
Installation of south shore cofferdam pumps used to keep work area dry during dam construction, December 1956.



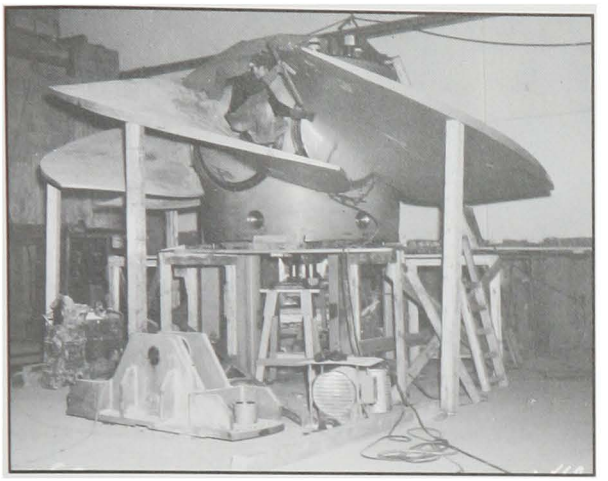
South shore cofferdam pumps, December 1956.

Excavation at Ice Harbor dam site, July 1956.

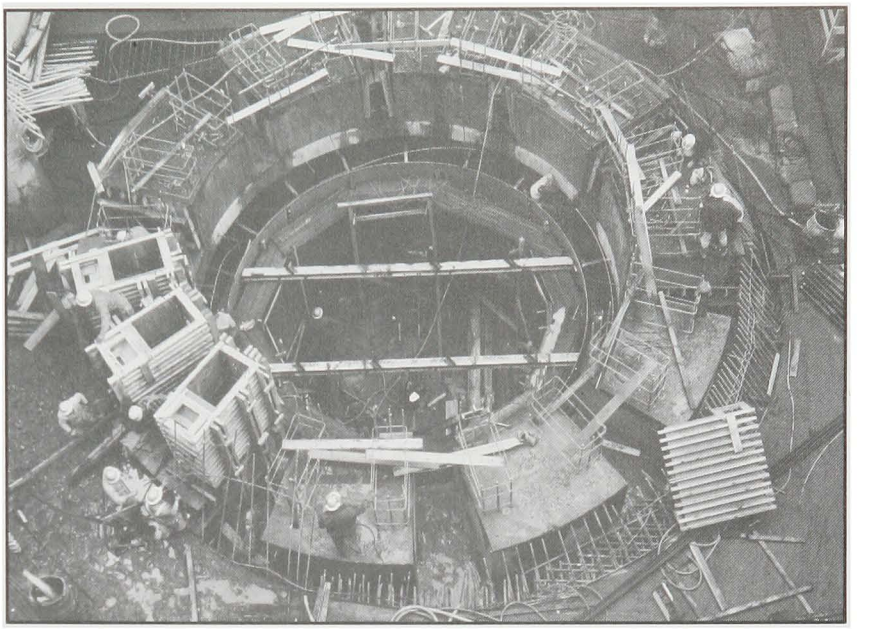
Draft tube area, powerhouse and non–overflow section under construction, January 1958.



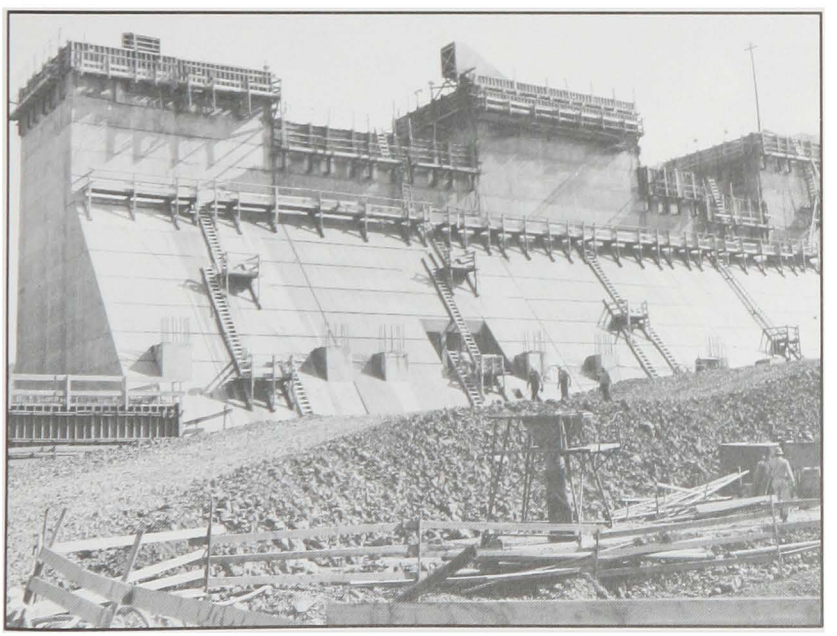
Construction of Ice Harbor finally got underway in 1956.



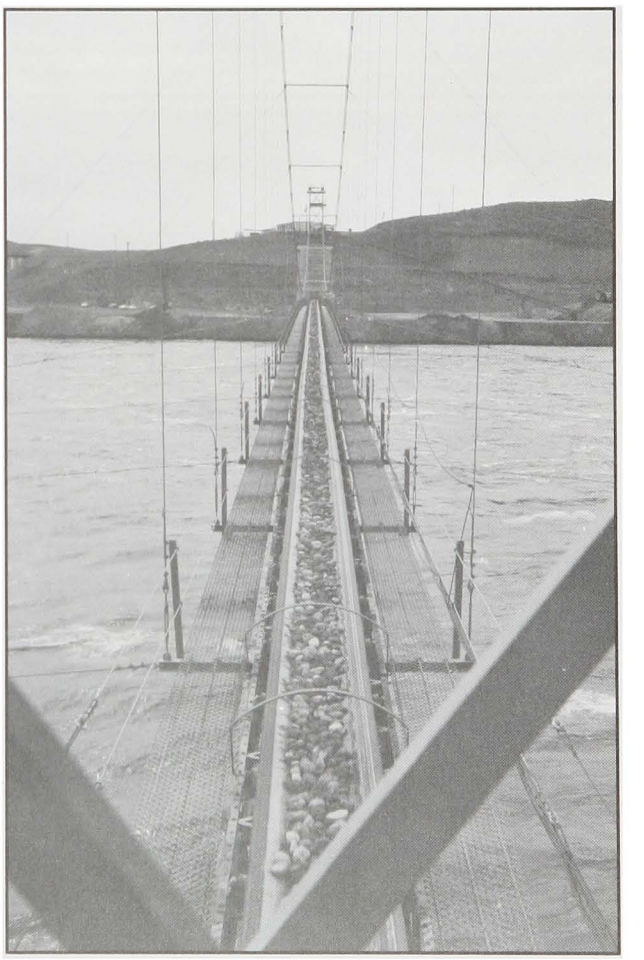
Turbine assembly awaiting installation in powerhouse, February 1960.



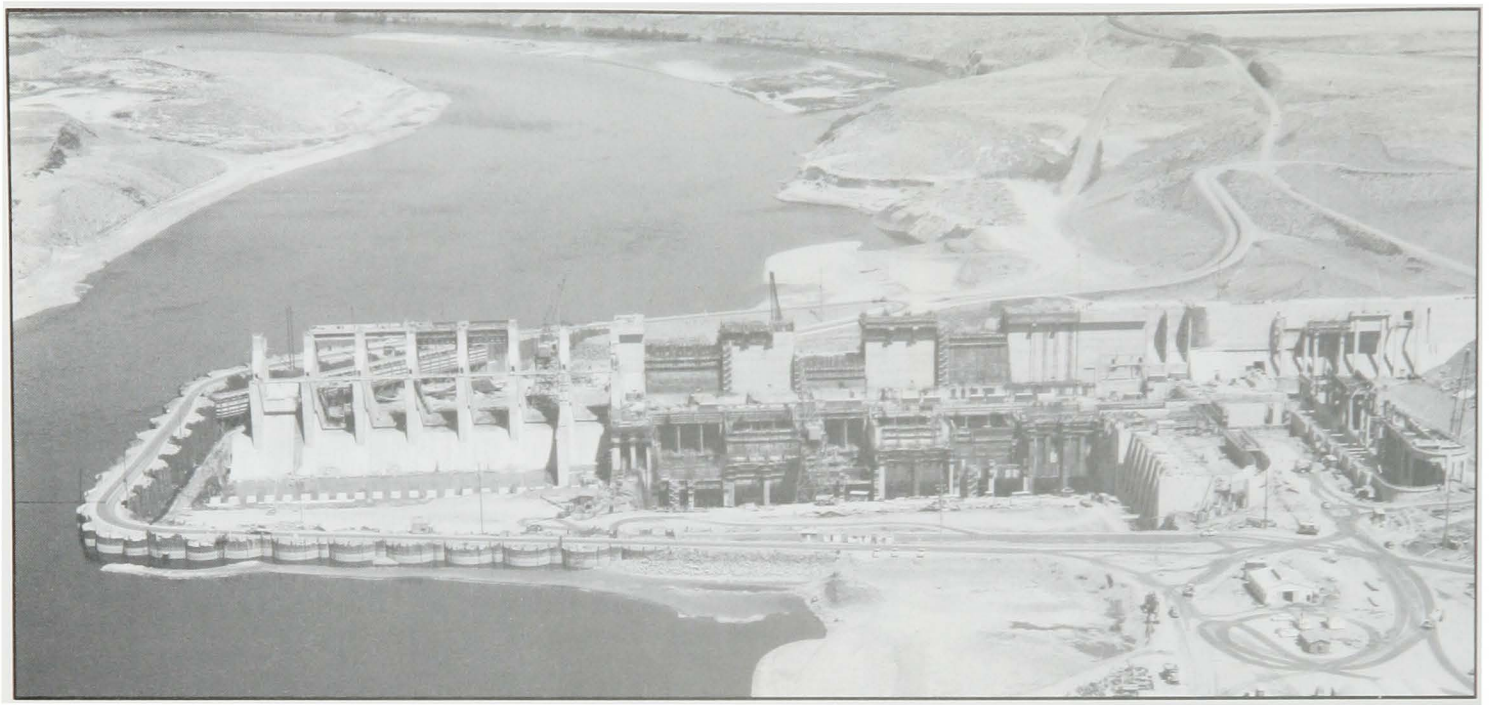
Construction for powerhouse unit number 3, February 1959.



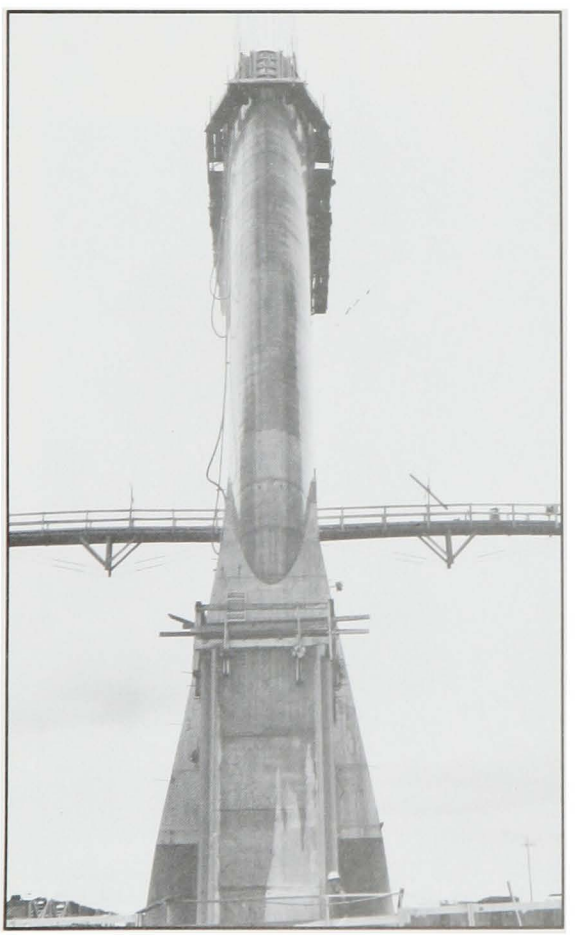
Construction of the south end of the non–overflow section, October 1957.



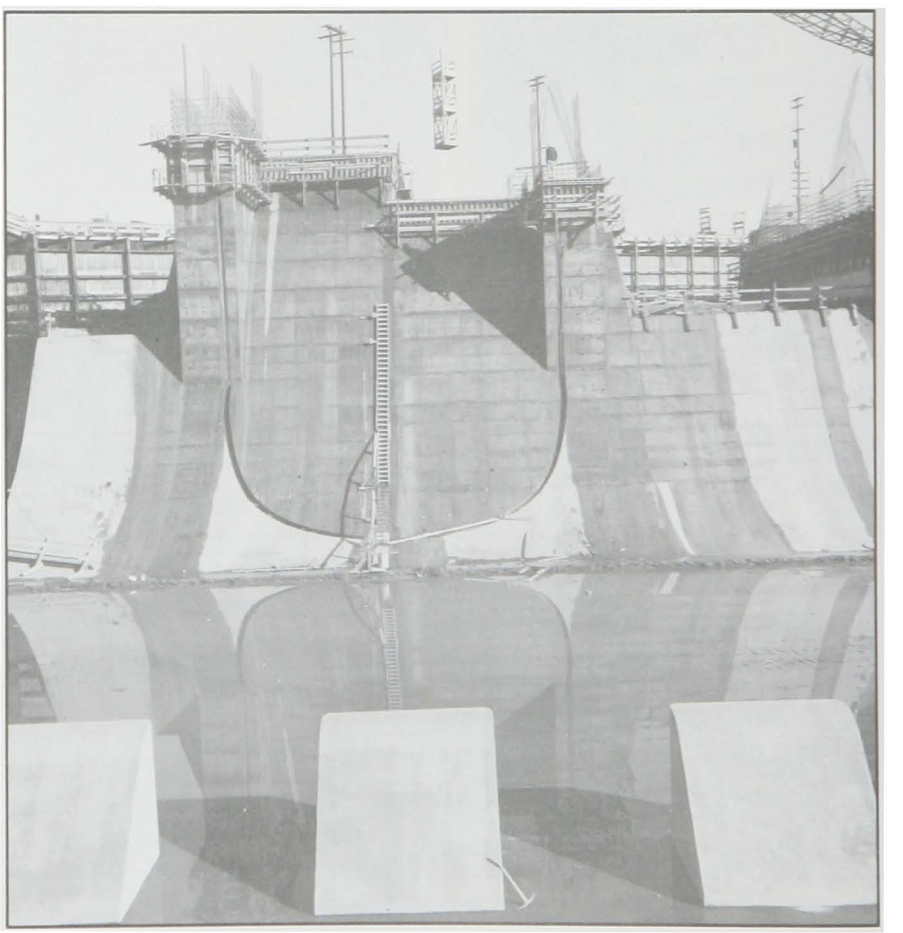
View looking south showing the aggregate plant conveyor belt across the river.



Aerial view of south shore construction.

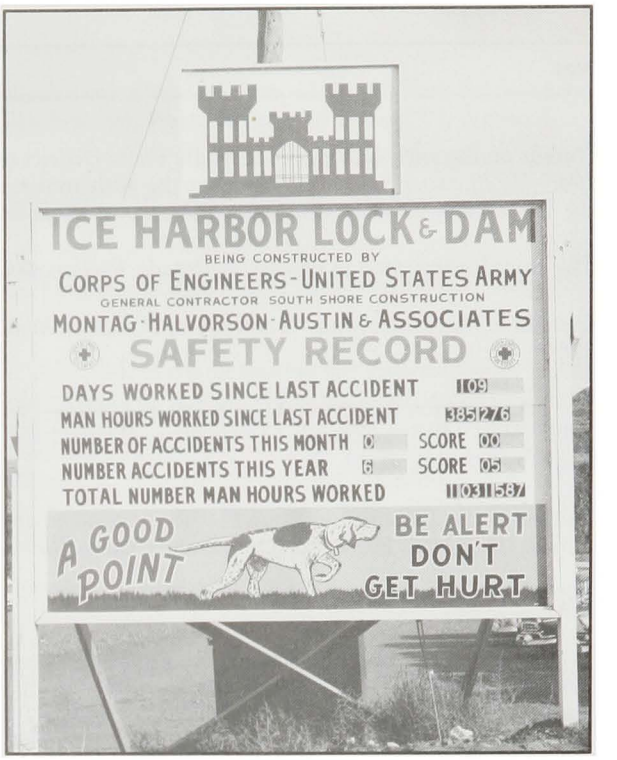


Pier in spillway construction, April 1958.

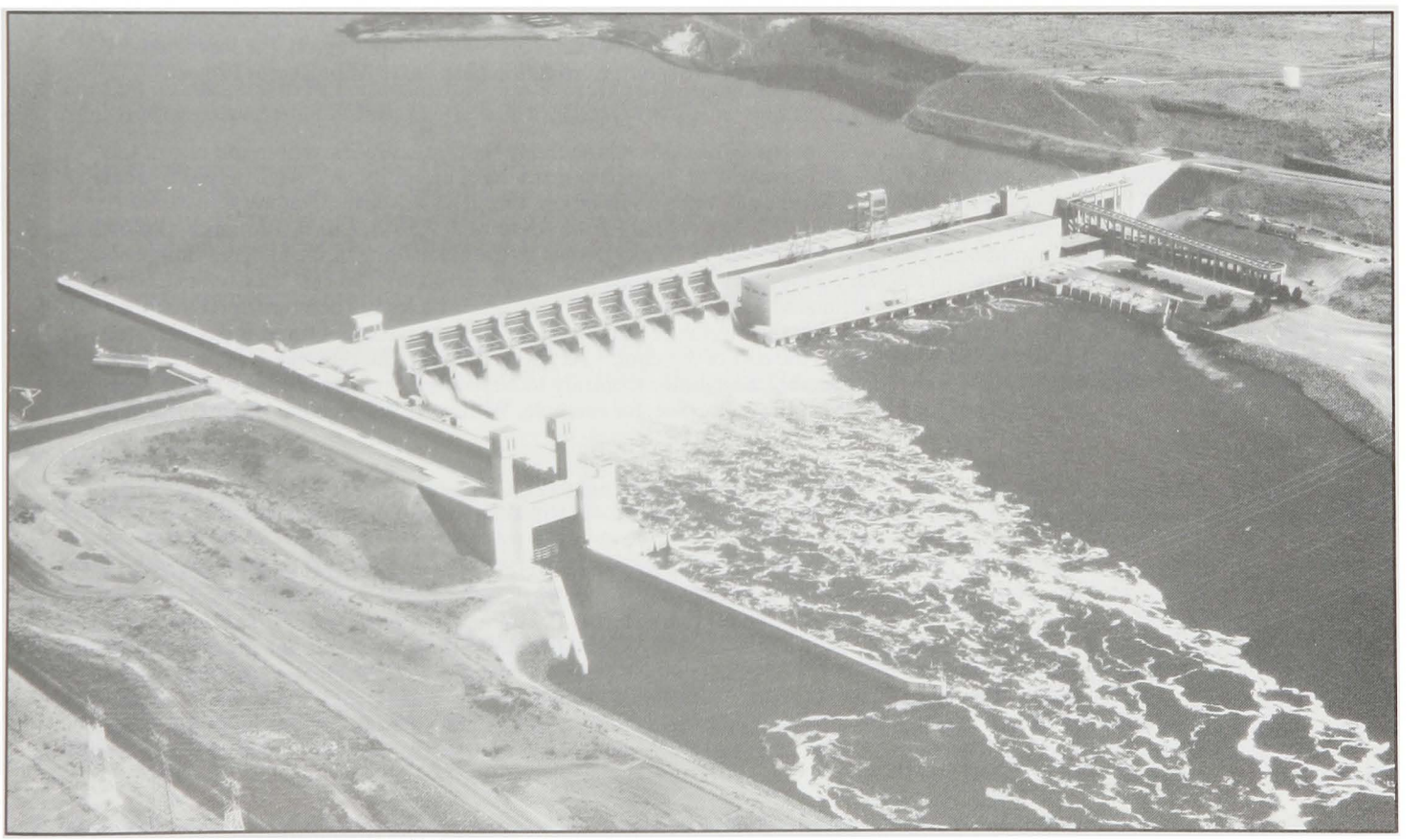


A section of spillway and stilling basin during construction, November 1957.

Fish ladder construction, May 1958.



Safety record sign at construction site, December 1957.



Ice Harbor Dam went into service in 1962.

[1] Details on the early history of the Walla Walla District come primarily from Howard Preston, *A History of the Walla Walla District, 1948–1970*, esp. pp. 39–68. Also, see the 40th anniversary issue of *Intercom*, 19:6 (Oct. 1988), the interdepartmental publication of the Walla Walla District; and Willingham, *Army Engineers and the Development of Oregon*, esp. pp. 150–51.

[2] The story is recounted in Oberst, *Railroads, Reclamation and the River*, p. 20.

[3] Quoted in Marjorie Hales, "The History of Pasco, Washington, to 1915" (unpublished Masters thesis, Washington State University, 1964), p. 10.

[4] For details on the Pasco Land Company, see "Pasco, Washington," and "Birth of a City," typescripts, William P. Gray Papers, Cage 1866, WSU MASC; Columbia Basin News, 2 Feb. 1962; Hales, "History of Pasco," pp. 93–4, 105; and Oberst, *Railroads, Reclamation and the River*, pp. 32–4.

[5] Details on the Palouse Irrigation Project––and the quotations that follow––can be found in McGregor, *Counting Sheep*, p. 220; Hales, "History of Pasco," p. 55–64; and Oberst, *Railroads, Reclamation and the River*, p. 64.

[6] Hales, "History of Pasco," p. 67.

[7] For details on the Burbank Project, see *Burbank*, a promotional brochure published by the project's backers, c. 1913. A copy is available at EWSHS. Also see Hales, "History of Pasco," p. 64; and, especially, two excellent historical pieces by journalist Ted Van Arsdol History of Ice Harbor Dam," 1962 typescript, Van Arsdol Papers, Cage 117, WSU MASC; and his seventeen–part history of Ice Harbor that ran in the *Tri–Cities Herald*, Oct.–Nov. 1961.

[8] For the long history of the Five Mile project see the two Ted Van Arsdol pieces cited above. Hopson's 1916 report is in VF 2740, WSU MASC. There are two major sources of primary materials relating to the Five Mile Rapids project. See cabinet VII, drawer 14, "Five Mile Dam" file, IEWA; and detailed correspondence concerning the project between the State of Washington, the Reclamation Service, and local promoters, in Washington State Department of Conservation Irrigation files, "Five Mile Rapids Project," 1919–26, box 2, Wash. Arch.

[9] The myth about the Corps' lack of concern at Bonneville probably started with Anthony Netboy, a prolific writer and one of the strongest advocates of fishery protection in the Pacific Northwest. His books and articles are insightful, and have helped increase awareness of the many difficulties facing the Columbia River's anadromous fisheries. But in his advocacy, Netboy sometimes overstates his case. For example, in his important 1958 book, *Salmon of the Pacific Northwest: Fish vs. Dams* (Portland: Binfords & Mort), he states, pp. 43–4: "Such strenuous objections were raised by fishery people to the blockading of the river by Bonneville dam that the Corps of Engineers was forced to include fish passage facilities in the plans for this structure. At first they were to consist of only four conventional ladders of moderate size . . . estimated to cost $800,000. When fishery biologists demonstrated that they would be palpably inadequate to handle the large fish traffic using this stretch of the river, an elaborate system of traps, locks, elevators, canals and ladders was devised which added $7 million to the cost of the dam." As detailed below, the remark––later retold in various versions by numerous other writers––is considerably inaccurate. Contrary to Netboy's intimations, fishery people were open in their praise of the cooperative attitude of the Corps at Bonneville. See, for example, William F. Willingham, *Water Power in the Wilderness*, pp. 47–8.

[10] Lukesh to Chief of Engineers, 8 Mar. 1929, RG 77, Records of the Chief of Engineers, Columbia River, File #7249, Nat. Arch.; Kuentz, "The Lower Columbia River Project," *Military Engineer*, 25:139 (Jan.–Feb. 1933), p. 44.

[11] For background on fishways at Bonneville, see U.S. Congress, *Columbia River and Minor Tributaries*, 73rd Cong., 1st Sess., 1933, H. Doc. 103; U.S. Army, Chief of Engineers, *Review of Report on the Columbia River, Washington and Oregon* (Washington, D.C.: Government Printing Office, 1934), 73rd Cong., 2d Sess., S. Comm. Print; Harlan B. Holmes, *The Passage of Fish at Bonneville Dam, Oregon Fish Commission Contribution #2* (Salem: Oregon Fish Commission, 1940); and Willingham, *Water Power in the Wilderness*, pp. 47–53. Unfortunately, Frank N. Schubert's "From the Potomac to the Columbia: The Corps of Engineers and Anadromous Fisheries," has never been published. However, a 1978 typescript is available for researchers at the Office of History, U.S. Army Corps of Engineers, Ft. Belvoir, Va. Schubert, pp. 40–58, offers the most detailed and accurate history yet written of the fishery problem at Bonneville. For the cooperation between the Corps and fishery people see Charles E. Jackson, Bureau of Fisheries to Sen. Charles McNary, 9 Nov. 1933, box 33, McNary Papers.

[12] U.S. Congress, *Commissioner of Fisheries, Report on Bonneville Dam and Protection of the Columbia River Fisheries*, 75th Cong., 1st Sess., 1937, S. Doc. 87; Schubert, "From the Potomac to the Columbia," pp. 56–7.

[13] Ibid.

[14] For background on the hearing and the IEWA conversion, see the considerable correspondence of Feb.–Mar. 1937 on this issue in Acc. #68–A–92, Department of Fisheries papers, "Stream Improvement" files, box 746, Wash. Arch.; and cabinet VI, drawer 3, "Lewiston Hearing," 1937 file, IEWA.

[15] W.S. Nelson, The Dalles Chamber of Commerce to Herbert West, 19 Dec. 1945, cabinet VI, drawer 2, "Fish, Through 1951" file, IEWA.

[16] U.S. Congress, *Snake River Oreg., Wash., and Idaho*, 77th Cong., 1st Sess., 1941, Hearings before House Committee on Rivers and Harbors, pp. 14–15.

[17] The Department's proposal came in a memorandum from Warner W. Gardner, Asst. Sec. of the Interior to the Federal Inter–Agency River Basin Committee, 24 Mar. 1947, cabinet VI, drawer 3, "Miscellaneous Hearings" file, IEWA. For additional background on the moratorium see Roy Scheufele, "History of the Columbia Basin Inter–Agency Committee," typescript, n.d., pp. 22–8, copy in the library, Portland District, Corps of Engineers; Scheufele, *The History of the North Pacific Division, U.S. Army Corps of Engineers, 1888 to 1965* (Portland: North Pacific Division, U.S. Army Corps of Engineers, 1969), pp. 23–4; and Charles McKinley, *Uncle Sam in the Pacific Northwest*, pp. 386–7, 429–31, 473–5. Also see Acc. #1659–2, box 14, CBIAC. The CBIAC's decision against a moratorium is outlined in a 24 Nov. 1947 news release in this box.

[18] Col. O.E. Walsh, Portland District Engineer to Leo Laythe, Fish and Wildlife Service, 26 Mar. 1947, RG 77, WWD files, box 9, Seattle NA.

[19] The quotation is in Alvin Anderson, Director, Washington Department of Fisheries to Congressman Cecil King, 25 Jy. 1950. For the Oregon arguments against the dams see John Veatch, Chairman, Oregon Fish Commission to House Sub–committee on Civil Functions, 16 Apr. 1951. Both are in Acc. #73–7–675, Department of Fisheries papers, Central files 1948–64, box 1010–42, Wash. Arch.

[20] The Corps' estimates from its "Letter Report, Lower Snake River Project," 20 Oct. 1948, are quoted in "Report Showing How the Army Engineers Have Juggled the Figures in Attempting to Justify the Four Lower Snake River Dams," n.d., Ibid.

[21] The first quotation is in Robert Schoettler, Director, Department of Fisheries to Sen. Kenneth McKellar, 16 Jy. 1951; the second in John Hurley, Department of Fisheries to J.H. Cellars, Columbia River Packers Association, 12 Je. 1950; both Ibid.

[22] These arguments are made in several background papers and pieces of correspondence to be found in Acc. #73–7–675, Department of Fisheries papers, Central files 1948–64, box 1010–42, Wash. Arch. For particularly good examples, see C.L. Anderson, Director to Congressman Henry Jackson, 24 Feb. 1949; and Alvin Anderson, Director to Herbert West, 3 Apr. 1950. Also, see Robert Hicks, Ex. Sec., Columbia River Fishermen's Protective Union to Charles Baker, President, IEWA, 2 Nov. 1953, cabinet VI, drawer 2, "Fish, 1951–55" file, IEWA; and Lars Langloe, "Memorandum, Lower Snake River Dams," 6 Jy. 1950, Control #36–A–1–b, Department of Conservation papers, Director's General Correspondence, box 3, Wash. Arch.

[23] The quotations are in, respectively, Biggs to Charles Baker, President, IEWA, 3 Apr. 1952; and Hurley memorandum to Director Robert Schoettler, 13 Je. 1951. Both in Acc. #73–7–675, Department of Fisheries papers, Central Files 1948–64, box 1010–42, Wash. Arch.

[24] Hurley memorandum, Ibid.

[25] For the direct approach to friendly Congressmen, see Arnie Suomela, Master Fish Warden, Fish Commission of Oregon to Alvin Anderson, Director, Washington Department of Fisheries, 5 Apr. 1950; and Rep. Thor Tollefson to Anderson, 21 Sept. 1950. For other lobbying and pressure tactics, see John Hurley memorandum to Robert Schoettler, Director, 13 Je. 1951; Alvin Anderson, Director, telegram to President Harry Truman, 29 May 1950; and Anderson to "Dear Fishermen," 1 Mar. 1950. All in Ibid.

[26] The first quotation is in West to Idaho Governor Robert Smylie, 4 May 1955, box 5, Smylie papers. The second quotation is in Robert Schoettler, Director, Department of Fisheries to Members of the Public Works Subcommittee of House Appropriations Committee, 27 May 1955, Acc. #73–7–675, Department of Fisheries papers, Central Files 1948–64, box 1010–42, Wash. Arch. For various news stories about West's 1955 testimony and the resulting controversy, see *Walla Walla Union Bulletin*, 21 May 1955; Pasco *Tri–City Herald*, 22 May 1955 and 23 May 1955. For an example of the argument that dams can help fish, see *The Log*, newsletter of the IEWA, 7:6 (July 1955), p. 5.

[27] Walla Walla District news release, 2 Sept. 1955, RG 77, Acc. #T77–85–0018, WWD files, box 25, Seattle FRC. For summaries of fish run declines, see U.S. Congress, *The Salmon Fisheries of the Columbia River Basin*, 53d Cong., 2d Sess., 1894, S. Misc. Doc. 200; and U.S. Congress, *Bonneville Dam and Protection of the Columbia River Fisheries*, 75th Cong., 1st Sess., 1937, S. Doc. 87.

[28] The quotations are in M.T. Hoy, Oregon State Fisheries Director to Walla Walla District, 31 Oct. 1955; James Cellars, Ex. Sec., Columbia River Salmon & Tuna Packers Assn. to Maj. Gen. Charles Holle, Chairman, Board of Engineers for Rivers and Harbors, 27 Sept. 1955; and Neuberger to Brig. Gen. Louis Foote, North Pacific Division Engineer, 20 Sept. 1955. All in RG 77, Acc. #T77–85–0018, WWD files, box 25, Seattle FRC. The *Astorian Budget* quotation is in an editorial in that newspaper, 27 Sept. 1955.

[29] See Foote to Page, 26 Sept. 1955. Both in RG 77, Acc. #T77–85–0018, WWD files, box 25, Seattle FRC.

[30] West to Robert Hicks, Columbia River Fishermen's Protective Union, 24 May 1952, cabinet VI, drawer 2, "Fish, 1951–55" file, IEWA; West to Anderson, 7 Mar. 1950; West to John Biggs, Director, Washington Department of Game, 14 May 1952. Both the latter in Acc. #73–7–675, Department of Fisheries papers, Central Files 1948–64, box 1010–42, Wash. Arch.

[31] Statement of Gus Norwood Relating to Appropriations for Corps of Engineers Civil Functions, 18 Apr. 1952, box 128, NPPA.

[32] *Power for Defense* (Walla Walla: Inland Empire Waterways Assn., c. 1952); *The Pacific Northwest Public Power Bulletin*, 5:13 (22 Je. 1951), p. 3.

[33] M.W. Boyer, AEC to Magnuson, 27 May 1952, copy in cabinet VIII, drawer 1, "Ice Harbor Dam Power" file, IEWA. For the 1950 AEC effort, see the seventh installment of Ted Van Arsdol's newspaper history of Ice Harbor that appeared in the Pasco *Tri–Cities Herald*, Oct.–Nov. 1961.

[34] Schoettler to Sen. Kenneth McKellar, 15 Jy. 1951, Acc. #73–7–675, Department of Fisheries papers, Central Files 1948–64, box 1010–42, Wash. Arch.

[35] The quotations are in, respectively, Warner W. Gardner, Asst. Sec. of the Interior, memorandum on Columbia River dams and salmon, 24 Mar. 1946, Cabinet VI, drawer 3, "Misc. Hearings" file, IEWA; C.L. Anderson, Director, Washington Department of Fisheries telegram to Sen. Kenneth McKellar, 15 Apr. 1949; and Anderson to Congressman Henry Jackson, 24 Feb. 1949. Both the latter in Acc. #73–7–675, Department of Fisheries papers, Central Files 1948–64, box 1010–42, Wash. Arch. The Oligher quotation is from his interview with the authors, 12 May 1992.

[36] See Lloyd Royal, Chief Biologist, Washington Department of Fisheries to James Simpson, Fish Culturist, Idaho Department of Fish and Game, 10 Sept. 1948, Washington Department of Fisheries papers, Ibid.; Milo Moore, Director, Washington Department of Fisheries to Col. O.E. Walsh, Portland District Engineer, 28 Jy. 1948; and M.R. Litt, Head, Corps' Fish Facilities Section to Chief, Walla Walla District Engineering Division, 30 Nov. 1948. Both in RG 77, WWD Civil Works Project Construction files 1925–48, box 3, Seattle NA. The quotation is from the Oligher interview, which also provided the information on turbine design.

[37] Summaries of the long struggle to obtain construction funds for Ice Harbor can be found in several places. The following account is taken from these sources: "Legislative History of Fight for Ice Harbor Dam Traced by IEWA," IEWA news release, 10 Aug. 1955, cabinet VIII, drawer 1, "Ice Harbor 1952–present" file, IEWA; and the Pasco *Tri–City Herald*, 14 Apr. 1957. In addition, copies of the IEWA's newsletter *The Log* carried summaries of annual legislative victories and defeats in this period.

[38] Magnuson to Frederick Lawton, 29 Je. 1951, cabinet VIII, drawer 1, "Ice Harbor to 1952 file," IEWA.

[39] The first quotation is in Netboy, *Salmon of the Pacific Northwest*, p. 79. The second is in the IEWA's "President's Address," 22 Nov. 1955, box 59, NPPA.

[40] The first quotation is in the seventh installment of Ted Van Arsdol's newspaper history of Ice Harbor, Pasco *Tri–City Herald*, Oct.–Nov. 1961; the second in the *Walla Walla Union–Bulletin*, 6 Dec. 1961; and the third in *Columbia Basin News*, edit., 18 Jy. 1957.

[41] Harry Drake, interview with the authors, 27 Apr. 1992.

[42] For background on the construction history of Ice Harbor, see *Spokane Spokesman–Review Magazine*, 20 Dec. 1957; Ted Van Arsdol, "History of Ice Harbor Dam," typescript, 1962, Van Arsdol papers, Cage 117, WSU MASC; Van Arsdol's seventeen–part series on Ice Harbor history, Pasco *Tri–Cities Herald*, Oct.–Nov. 1961, esp. parts 8 and 9; and Preston, History of Walla Walla District, 1948–70, pp. 215–29. Also see George C. Richardson, "Ice Harbor Navigation Lock," typescript, c. 1965, available at Army Corps of Engineers Walla Walla District library. The Baker quotation is in Baker to Gus Norwood, Northwest Public Power Association, 8 Dec. 1950, box 69, NPPA. Details on the Ice Harbor dedication can be found in RG 77, Acc. #T77–85–0034, box 4, and Acc. #T77–85–0022, box 16, WWD files, Seattle FRC. Additional dedication information and materials are in Series 1.1, box 121, folder 13, Church Papers. Also see *Walla Walla Union Bulletin,* 10 May 1962.

Chapter 8
Monumental, Goose, and Granite

Take a photo of Ice Harbor Dam, tinker with it so the navigation lock and its 700–ton vertical–lift gate rests on the opposite side of the river, add about 1,000 feet to its length, change the scenery to a dramatic canyon backdrop, and you have Lower Monumental Dam. "To tell the truth, I have a hell of a time telling any of the lower Snake dams apart when I see pictures of them," joked Harry Drake, who had a major hand in designing them. But similar style is about all that is comparable in the histories of Ice Harbor and Lower Monumental, two projects standing a little more than 30 miles apart. [1]

There was a bit of a struggle for Lower Monumental, but, in comparison to Ice Harbor, the protests were mild. Fishery people worked with the Corps to develop fish passage facilities at the dam and made few protests.

When the National Wildlife Federation testified against allocating construction funds, the IEWA chided them for their "age–old emotional approach to the fish problem, offering no solution and no effort to reach a solution." No one in Congress paid much heed to the federation's pleas. [2]

Dwight Eisenhower again proved to be a more serious adversary, adhering to his "no new starts" philosophy. Once again, Warren Magnuson outflanked the former general in a House–Senate Conference Committee and obtained construction funds in the summer of 1960. In a letter to Herbert West, Magnuson described the effort:

> *Looking back on that Conference Committee, Herb, I believe the Lower Monumental start is one of the biggest achievements ever!*
>
> *Actually, [the] 1955 . . . Conference when we got Ice Harbor [money] was . . . by comparison only [a] tea party.*
>
> *Same old story, isn't it Herb. Only delay, until we push them into taking action!* [3]

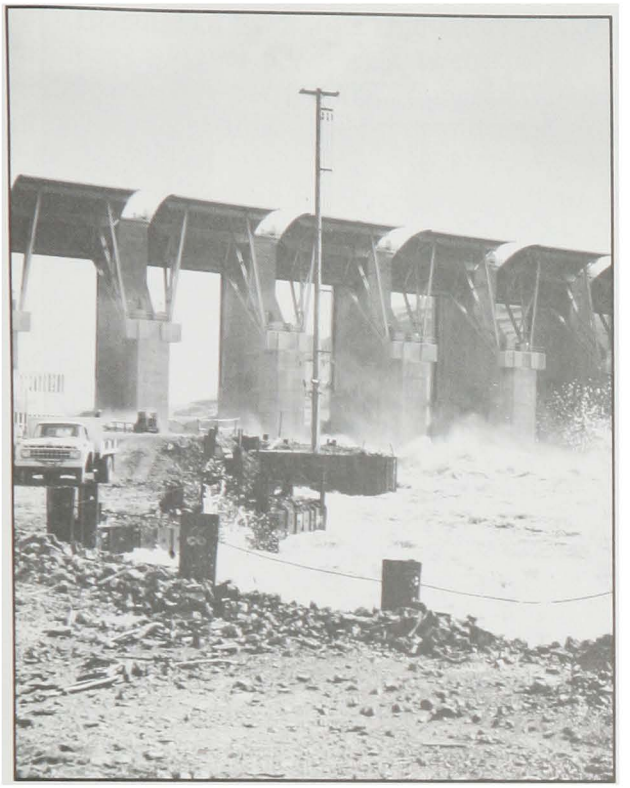
Magnuson freed a modest $1 million for start–up, but it was all he needed. With the way opened, construction appropriations flowed steadily. The effort to preserve the Marmes archaeological site created the only major controversy at Lower Monumental.

The Walla Walla District received the bulk of construction funds allotted to the Corps' North Pacific Division in the early 1960s. It was finishing Ice Harbor and was in the midst of major construction at John Day on the Columbia. Congress would soon consider start–up funds for the next in the lower Snake series of dams, Little Goose. The District's staff was overworked while the Corps' Seattle District faced possible layoffs. In 1962, the Division Engineer shifted responsibility for constructing Lower Monumental to Seattle. Walla Walla, which had supervised planning and initial construction, remained in charge of overall planning. Upon completion of the project, the Seattle District turned Lower Monumental over to Walla Walla for maintenance and operation. [4]

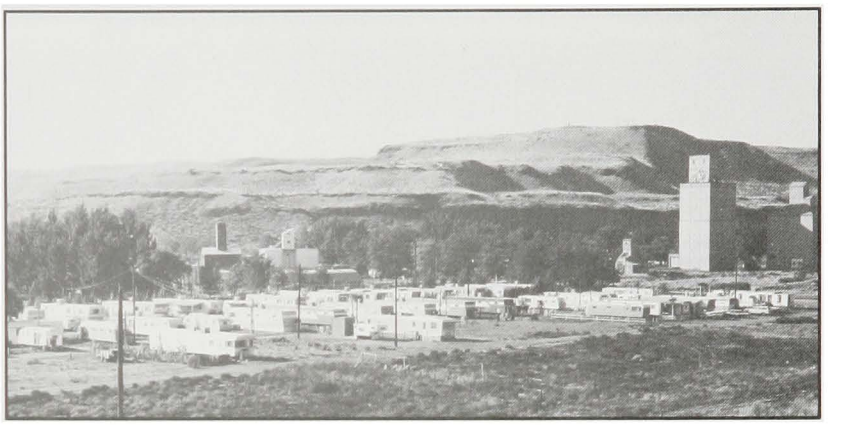
The Seattle District supervised more than 1,000 workers at the site during peak construction of the $177 million project. The Corps named it after a large rock creased with vertical basalt columns, a landmark Lewis and Clark called "Ship Rock" but later travelers renamed Monumental Rock. In February 1969, the Engineers began filling the dam's reservoir. [5]

There was considerable debate over naming Lower Monumental's pool. In the 1960s, the leading candidate seemed to be "Lake Alice Clarissa Whitman," after Marcus Whitman's daughter. Others hoped to continue the Lewis and Clark theme established at Lake Sacajawea behind Ice Harbor. Congress took no action for many years but, in 1978, decided upon "Lake Herbert G. West." Herb West died in 1974. With the possible exception of Warren Magnuson, no other person was more responsible for this and the other three reservoirs stretching from Ice Harbor to Lewiston. It was fitting that he be memorialized at one of them. [6]

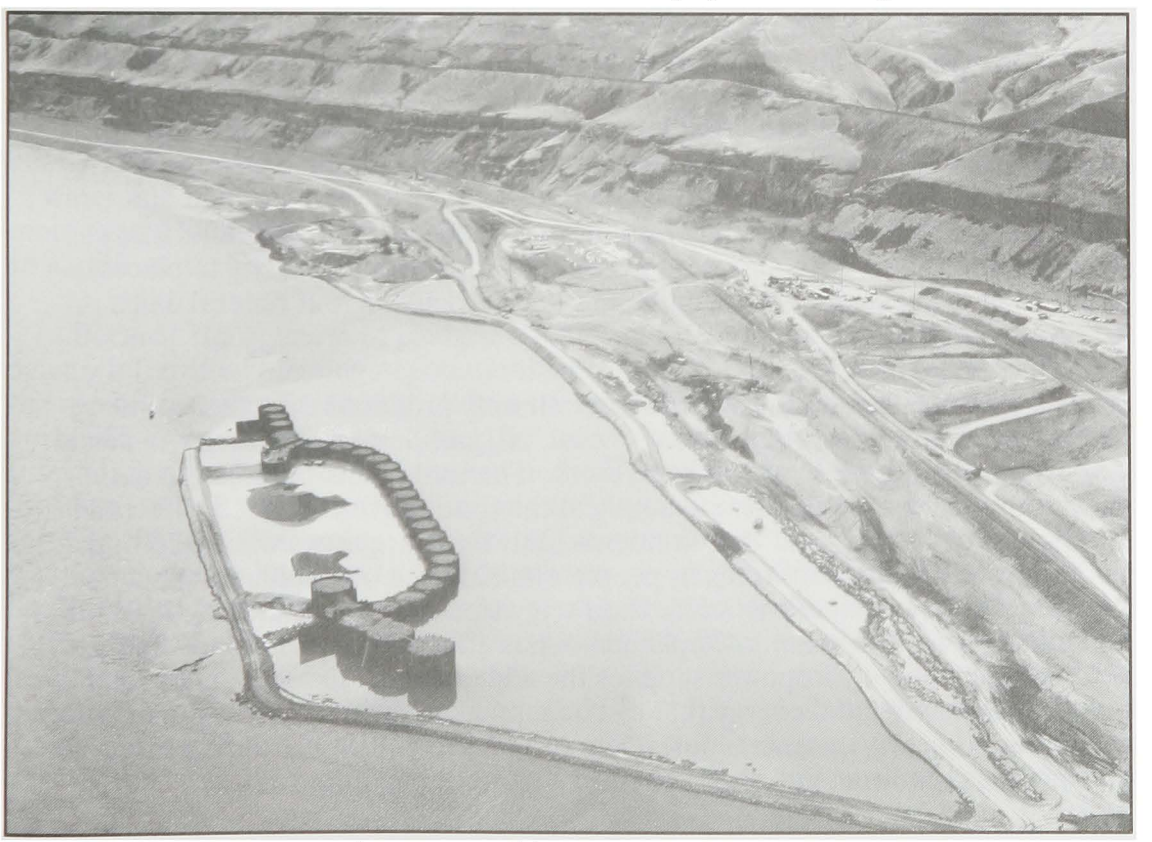
Lower Monumental Dam received its name fron Monumental Rock.



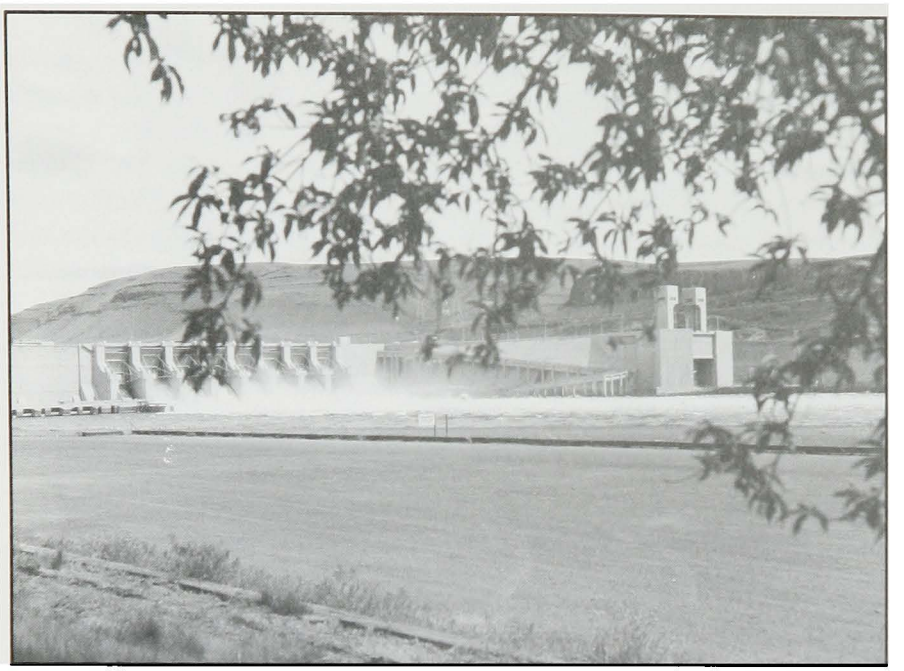
Construction at Lower Monumental Dam, 1960s.



Trailer camp at Kahlotus provided housing for some of the 1,000 laborers employed constructing Lower Monumental Dam.



Aerial view of Lower Monumental construction, February 1962.



Lower Monumental Dam.

Lower Monumental second powerhouse construction, September 1978.

In June 1965, the Walla Walla District signed the largest civil works contract in the Corps of Engineers' history to that time, obligating $72 million to a California construction conglomerate, Vinell–Mannix–Fuller–Dillingham, to build Little Goose Dam, about 30 miles upstream from Lower Monumental. The Corps completed this project with the least controversy of any of the four lower Snake River dams. Nonetheless, for a brief time it appeared doubtful that Little Goose would be built any time soon. To understand why requires some knowledge of hydropower and how it is marketed in the Northwest. [7]

Electricity cannot be stored. It must be used at the exact instant it is produced. This characteristic has served to tie together vast regions of the country with mazes of power lines supplying electricity to places of need. Since the sparsely populated lower Snake does not require all the electricity its four federal dams produce, huge power lines carry this surplus elsewhere.

Electricity produced at dams is generally less expensive and more flexibly produced than that from thermal plants. Regardless of the heat source in thermal plants--coal, oil, gas, or nuclear energy--steam is generated to drive turbines which, in turn, drive electrical generators. Thermal plants can make great quantities of electricity, but they cannot always produce it efficiently at the time of greatest need. Thermal plants provide what electrical suppliers call "base load" requirements. But there are times when additional, short–term energy is required, usually early in the morning as people awaken, turn on appliances, and heat coffee; and again at night as they fix dinner and sit down before their television sets. Since electricity cannot be stored, and since thermal plants are something akin to elephants--powerful and efficient once they get going but rather cumbersome to get started--hydropower supplies the added energy to meet "peak load" demands. Water behind a dam represents potential energy that can be tapped as easily as turning on a faucet. No heat is involved, and response time is nearly instantaneous. Dam turbines might sit idle during most of the day while thermal plants supply base requirements, then spin into action during times of peak needs.

Because of its unique characteristics, hydropower is much in demand, and the Columbia/Snake basin produces a bigger percentage of the nation's hydroelectricity than any other river system. Naturally, there are people in other parts of the country who have looked enviously at this source of abundant power and dreamed of tapping it. In the 1960s they did so, courtesy of the Bonneville Power Administration (BPA).

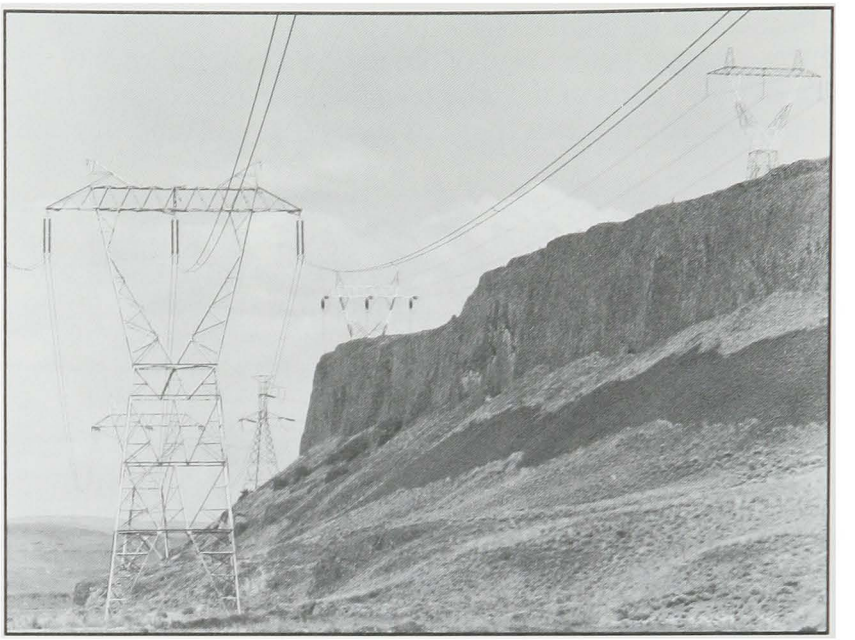
When Franklin Roosevelt ordered the Bureau of Reclamation and the Corps of Engineers to build Grand Coulee and Bonneville dams, he touched off a great debate over who would market the power from these and other Northwest dams. Some said the Bureau should sell it; some said the Corps. Roosevelt's New Dealers opted instead for a new, independent agency, the BPA. Since the late 1930s, Bonneville has marketed all electricity produced by federal dams and power plants in the Pacific Northwest. Selling millions of kilowatts of energy to public and private companies, BPA came to control the largest bloc of power in the West.

When Congress authorizes the Corps of Engineers to build a dam, it does so only if benefits exceed costs. Along the lower Snake a great percentage of the return on investment had to come from the sale of hydroelectricity. If the Corps was to receive construction money, then BPA had to find some way to sell the energy its dams would produce. The BPA proved itself an aggressive marketer, constantly seeking new sources of energy and places to sell it. In the early 1960s, its efforts led the agency into the field of international diplomacy.

Since the Columbia's headwaters lie in Canada, regulation of streamflow there would create great benefits for power, navigation, and flood control in the United States. Even with dams on the Columbia and lower Snake, augmented by others already built or planned on tributaries, the Corps contended it could not fully protect against major possible flooding of the lower Columbia without more storage in Canada. Additionally, by the 1960s, Columbia River dams in the United States produced only about one–third of their potential hydroelectricity because there was no control over streamflow north of the border. The Corps also had studied a tremendous energy source on the Kootenai River near Libby, Montana. But to build a dam there would back a reservoir into Canada. Obviously, some negotiating between countries was necessary.

Consequently, in 1964, the United States and Canada signed a water rights treaty under negotiation for nearly 20 years. It pledged Canada to construct three huge dams that could impound 15.5 million acre–feet of water and help regulate streamflow in the United States. In exchange, the United States would pay Canada more than $300 million for the resulting increase in downstream power, navigation, and flood control benefits. In addition, the Corps would build Libby Dam.

Because the agreement pledged a lot of money to Canada, the BPA had to find a way to earn it. The agency intensified ongoing negotiations within the United States to market some of its vast stores of energy to the rapidly growing Southwest. While the final Canadian Treaty documents were being processed, Congress approved a system called the "intertie," an intricate network of high–voltage electric lines, the biggest transmission project ever undertaken in the United States. The intertie knits together utilities in eleven Western states, stretching from Canada to Mexico. At the time of negotiations in the 1960s, the intertie served primarily as a means of marketing surplus energy from north to south. But electricity can flow both ways along power lines, and as the Northwest grows, it will receive benefits. The highest power needs in the Southwest come in the summer as people flip on air conditioners. In the Northwest, it is just the opposite as residents use more energy in winter for heat. The intertie assists both regions in meeting seasonal needs. [8]



While inland Northwest residents struggled for decades for an open waterway, the Corps could justify dam construction only because of the four dams' hydroelectric potential. Transmission towers near Lower Monumental, 1973.

In the midst of all this high–powered negotiating, Herbert West and Senator Warren Magnuson turned to Congress for start–up money for Little Goose and Lower Granite dams. While the Canadian Treaty and the intertie eventually aided their cause, for a time it looked like all the treaty– and agreement–signing would bring more delays.

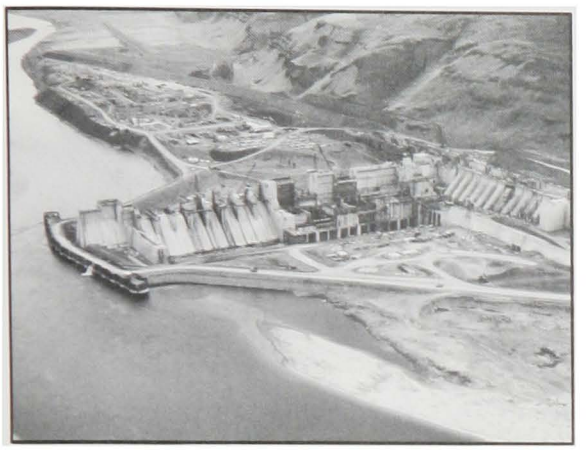
After Canada and the United States completed most of their negotiations, but before Congress approved the intertie, BPA administrator Charles Luce appeared before Congress to say the Corps should delay Little Goose and Lower Granite construction because the BPA had a surplus of energy. [9]

This testimony from a former ally in lower Snake development angered Herbert West. Even if the dams added to an energy surplus, farmers needed them for navigation, he claimed. "We will have to enlist every bit of strength that possibly can be brought to bear" to keep the projects on schedule, he warned IEWA members. [10]

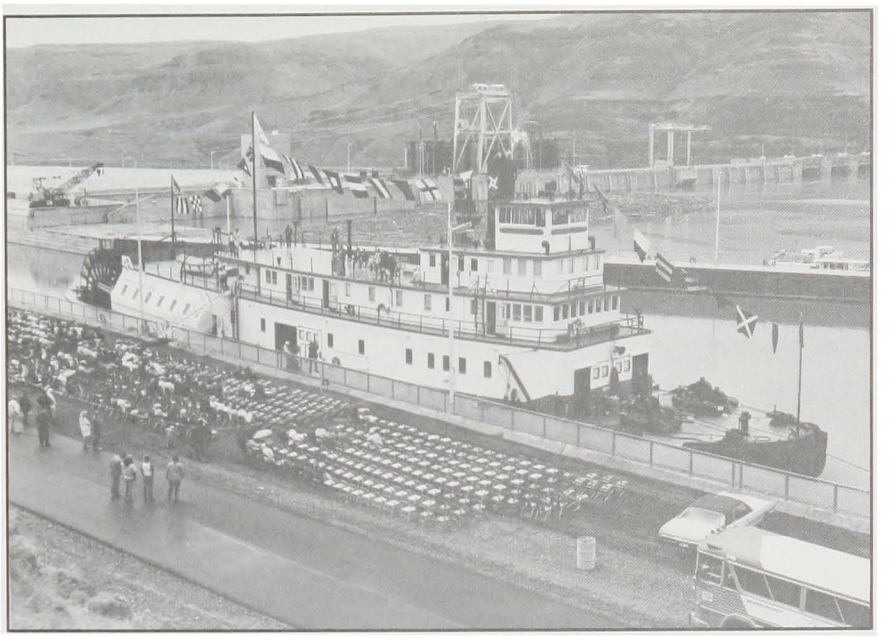
Luckily for West and other Snake River promoters, the BPA soon returned to the fold. In August 1964, just four months after Luce's pessimistic testimony, Congress approved the intertie. Now, a demand existed to meet the new supply. Indeed, the BPA predicted just one year later that its power needs would more than double in the decade ahead. [11]

The Corps signed its gigantic Little Goose construction contract and workers completed the dam in 1970, a 2,600–foot–long structure whose backwaters inundated an island called Little Goose, giving the structure its name. [12]

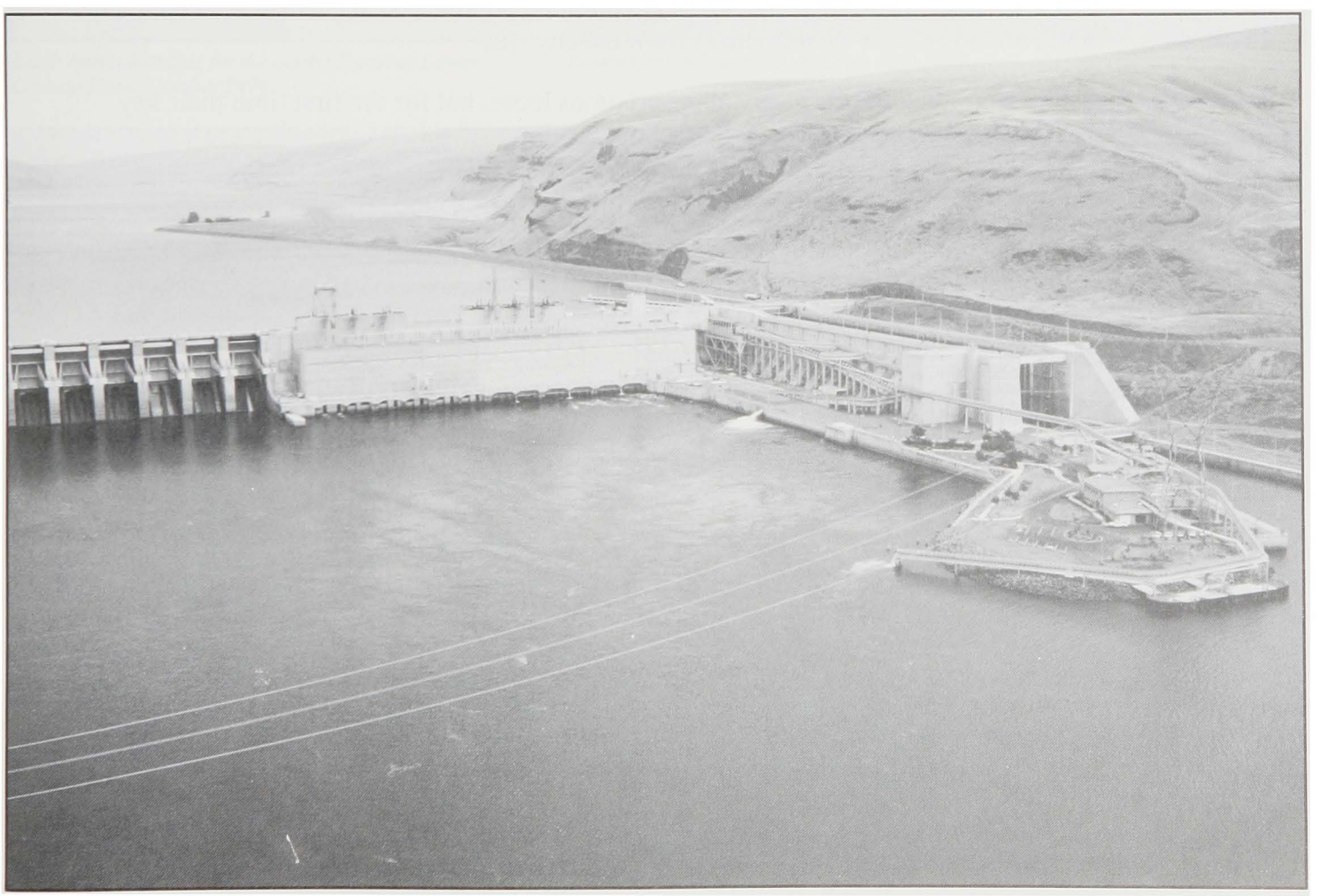
Little Goose survived the waxing and waning of the Canadian and intertie negotiations with only a brief delay in scheduling. The same might have held true at Lower Granite had the postponement not pushed construction into the height of the environmental movement, leading to a lawsuit against the Corps, and making the struggle for Lower Granite nearly as protracted as that at Ice Harbor.



Aerial view of Little Goose Dam construction, 1967.



Little Goose Dam dedication, June 1975.



Little Goose Dam on the Snake River.

Work started favorably at Lower Granite, named after an outcrop of granite at the river edge upstream from the dam. Congress appropriated initial construction funds in 1965, and for two years preliminary work went about as expected: contractors built a cofferdam, laid an access road, worked on the navigation channel. But by 1967, President Lyndon Johnson was in a political and economic bind. Protests of U.S. involvement in Vietnam grew at the same time the economy stagnated. Congress, led by powerful Northwest Senators like Warren Magnuson, Frank Church, and Mark Hatfield, continued to appropriate funds for Lower Granite, but Johnson's budget executives held back the money in an effort to combat inflation. The Corps did what it could at the dam site, but as the *Lewiston Morning Tribune* editorialized when speaking about Johnson's promise that the nation could have both guns and butter, "The economy couldn't stand the heat, and Lower Granite was one of the largest and first lumps of butter to melt." [13]

President Richard Nixon, taking office in 1969, proved just as unwilling to increase civil works spending. His first budget recommendation refused money for Lower Granite. Dam proponents brought out their lobbying arsenal, detailing many reasons why the government should finish the project. [14]

They claimed the region needed Lower Granite's electricity to avert a power shortage in the 1970s, and pointed out that up to 1969, the Corps had spent more than $40 million on Lower Granite, money that would be wasted unless the Engineers completed the project. Each year of delay caused the final price to increase due to inflation. The three dams downstream would do Lewiston no good unless the Corps also built Lower Granite, since slackwater would remain 40 miles away from the city. [15]

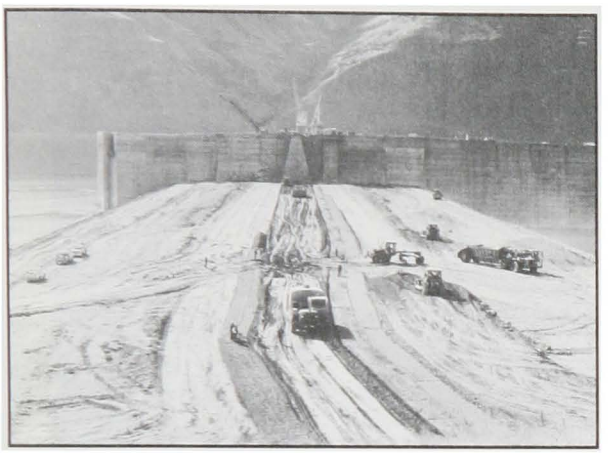
Northwest legislators continued efforts to pry appropriations loose, but for the first time their key advocate balked. Warren Magnuson believed it unlikely that Nixon would release enough money to construct all of the authorized waterways' work in the Northwest. He wanted Lower Granite, but there was another project that took priority: a third powerhouse at Grand Coulee.

Idaho's Democratic Senator Frank Church obviously was more attached to Lower Granite as it would bring benefits to his state. But he, like Magnuson, had little influence with the Republican White House and decided he could not battle Washington's senior Senator when "Maggie's people are putting all their public works eggs . . . in the Third powerplant basket at Grand Coulee." [16]

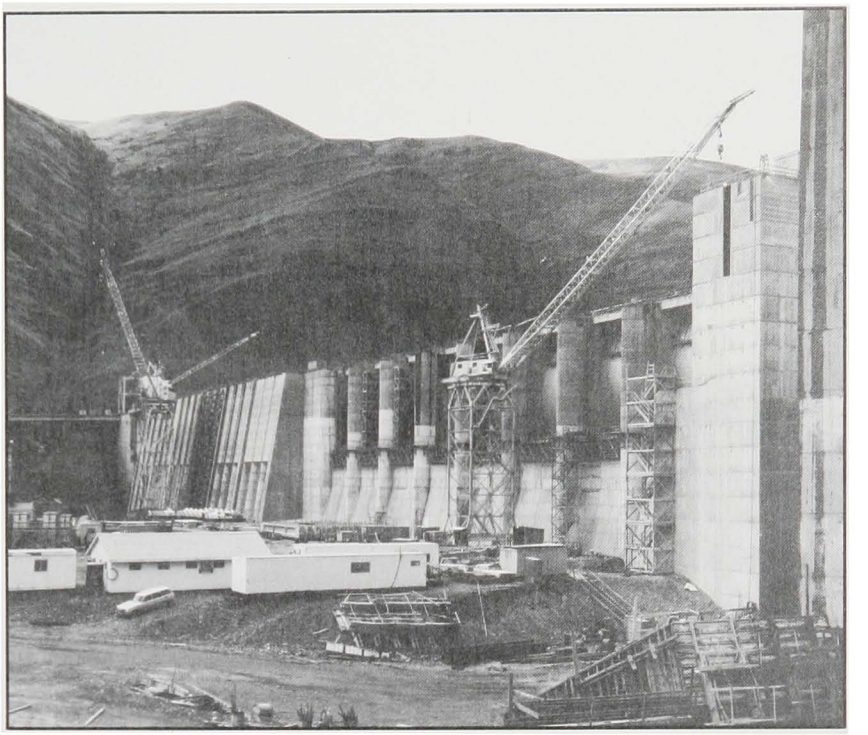
It remained for Oregon's Republican Senator Mark Hatfield to lead the charge for continued development of Northwest rivers. In a long, impassioned letter to Nixon, he urged a "re-examination of priorities in federal spending to upgrade the position of funds for water resource developments" in order to avert "an unbelievable [negative] impact upon the economy of the Northwest." [17]

The letter and continued lobbying by the IEWA and others brought results. In December, the Executive Branch released funds to the Corps for Lower Granite. The Walla Walla District opened bids for the main construction contract in March 1970, and work began two months later. [18]

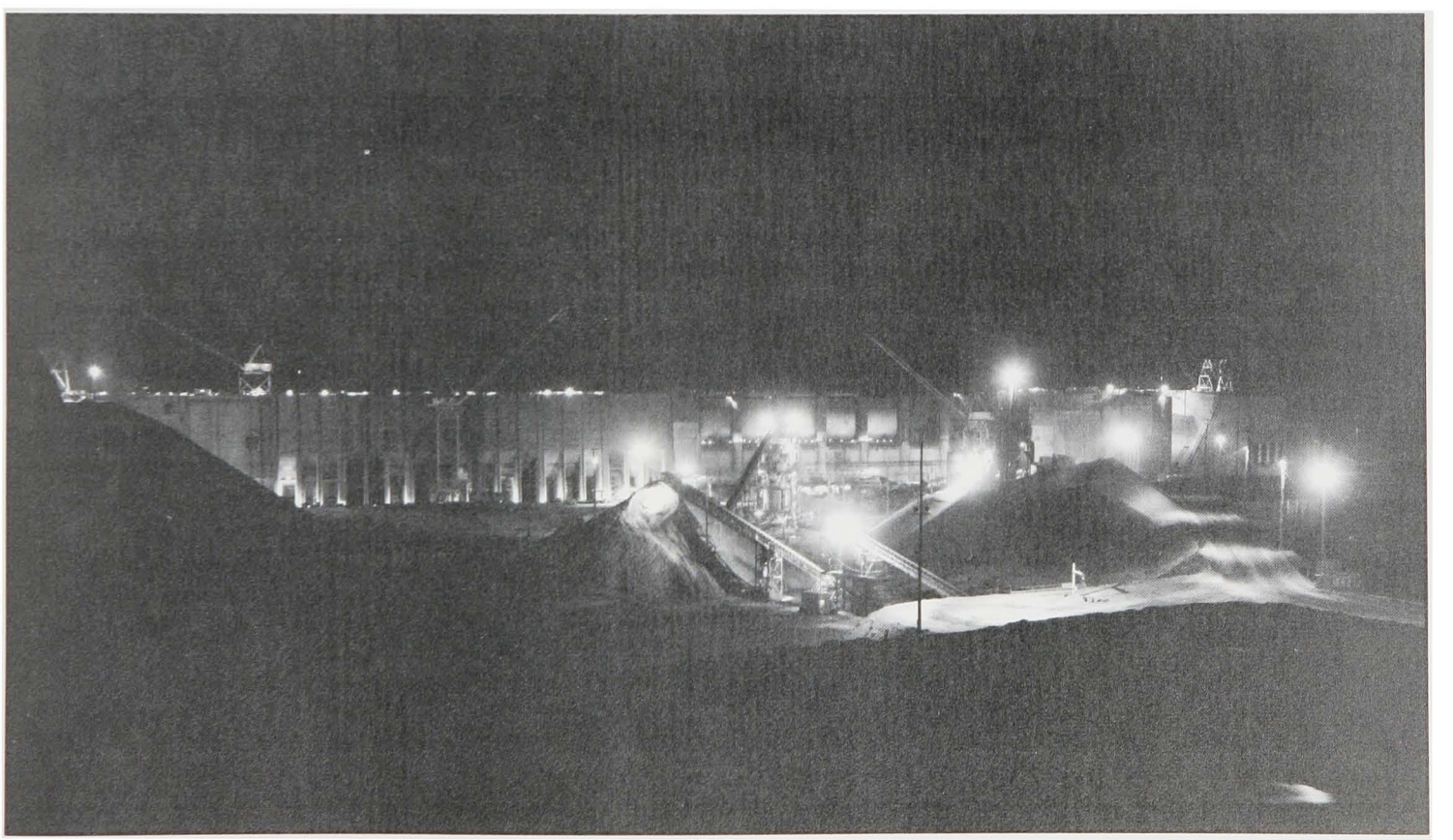
Dam proponents had many reasons to fight for the construction funds at Lower Granite, but underlying all was a growing fear. In 1969, dam advocates began to see public opinion shift from one of overwhelming support for river development to one of concern. They had good reason to worry, realizing that if they did not get going at Lower Granite the dam might never be built.



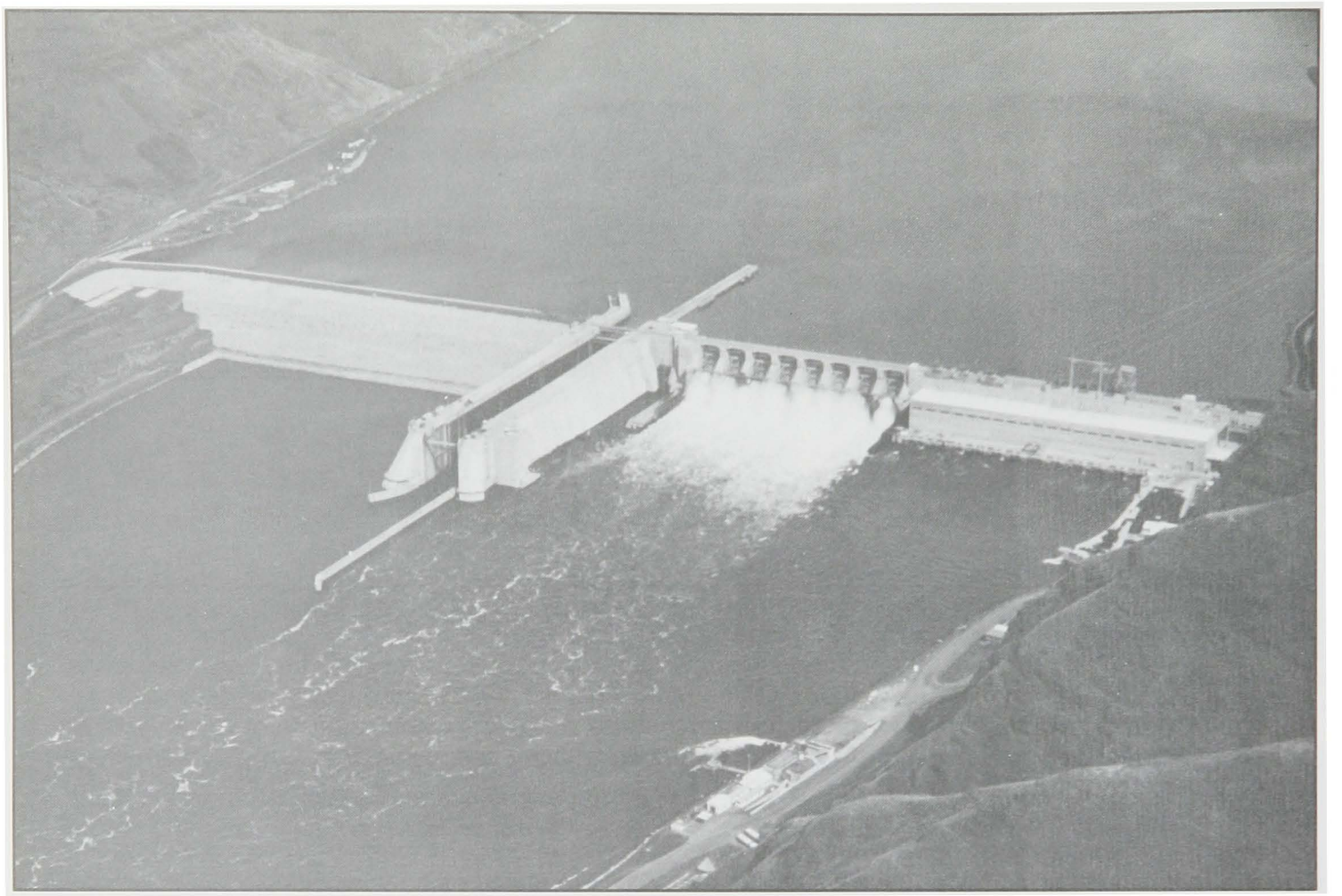
Earth mover heading for the earth fill part of Lower Granite Dam, October 1974.



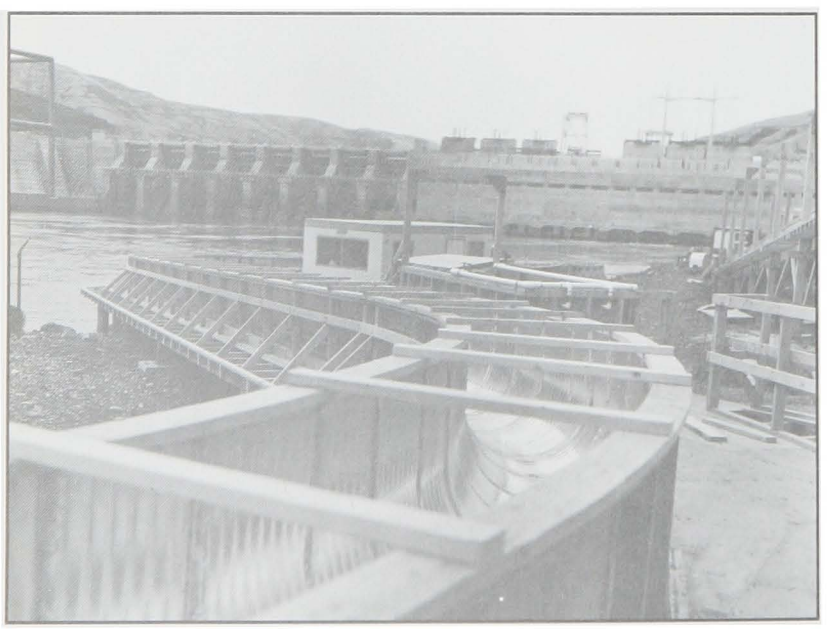
Lower Granite Dam construction, May 1973.



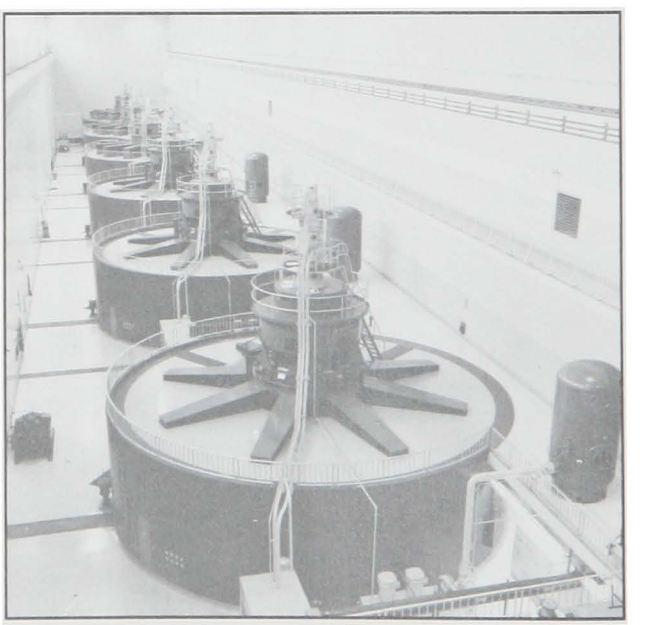
Lower Granite construction scene at night. Faced with a lawsuit threatening to halt work, the Corps rushed construction, April 1973.



Lower Granite Dam



Construction of juvenile fish bypass system model at Lower Granite, March 1985



View of Lower Granite powerhouse, 1991

The recognition of an attitude shift started gradually. In the spring of 1969, Don Thomas, an editorialist on Lewiston's KRLC radio station, began questioning the wisdom of completing Lower Granite. Could fish make it past one more barrier? Was it not more economical to halt development at Little Goose and truck supplies to ports there? Would Lewiston's long–awaited slackwater reservoir become a polluted pool? As Idaho's Republican Senator Len Jordan noted, "It is the first time I have ever heard of any criticism of building a dam down river from Lewiston by those who live in Lewiston. It shows some kind of a shift." [19]

It did not take long for others to recognize the changing times. The Manager of the Port of Clarkston attached a memo to two editorials speaking out against the proposed Asotin Dam upstream from Lewiston. "While these concern Asotin," he wrote Representative Catherine May's congressional aide, "better advise your boss lady that similar is in the offing for Granite. Better lean on BOB [Bureau of Budget] and the Chief of Engineers to award the main Granite contract ASAP. Tine wastin – – and trouble brews." [20]

Harry Drake, then Chief of the Engineering Division, years later reminisced about those days of rising environmental awareness. He laughed about it in the 1990s, but in the 1970s the changing attitudes caught the District by surprise:

> *On the very first Earth Day in 1970, Lewis–Clark Normal School students invited the colonel to Lewiston to discuss Lower Granite Dam. But the colonel said "Hell, no," so he told me to go! They put me in a chair in the middle of the gym and a couple hundred students sat around me. They all had loaded questions. They'd clap at their questions and boo at my answers. They even grilled me about the pollution we were causing in Gary, Indiana, because that city produced steel for the dam!* [21]

Dam proponents knew if construction began immediately it would be difficult for environmentalists to halt the work. Environmentalists were not destined to stop this dam; but, headed by the Association of Northwest Steelheaders, their opposition would be quite vocal.

The Steelheaders made a preliminary proposal to stop Lower Granite in 1969, when Senators Church and Jordan suggested a ten–year moratorium on dam–building on the middle Snake above Lewiston. The group claimed it made sense to extend the work–stoppage downstream to include Lower Granite. At first they appealed meekly. But, emboldened by heightened national interest in the environment and recognizing that they needed to act fast after the Nixon administration released construction funds, the Steelheaders became more aggressive. Still, they might not have made such a forceful stand had it not been for gas bubbles. [22]

Force more air into water than it can transfer back to the atmosphere and it supersaturates. A little too much oxygen, argon, carbon dioxide, neon, or helium does not do much damage, but air is 78 percent nitrogen, and water supersaturated with nitrogen kills. [23]

Rivers become naturally supersaturated when waterfalls or spillways carry trapped air deep into plunge pools. But nature generally balances itself, and supersaturated water rarely becomes a problem in free–flowing streams, where riffles and cascades allow dissolved gases to escape. This is called equilibration, and the Snake and Columbia rivers were always in equilibrium, until people started building dams.

Plunging water over a dam, particularly during spring freshets when there are high flows, places a lot of air in the river below. Dams generally do not create a serious problem if an ample free–flowing river remains to allow gases to dissipate. But a river transformed into a series of reservoirs eliminates the air's escape route, causing supersaturation. Too much supersaturation creates gas bubble disease, which can kill fish.

Divers have long understood that nitrogen supersaturation kills. A deep water diver is subjected to pressure forcing nitrogen into his blood, where it is dissolved. Unless he returns to the surface slowly, allowing time for his lungs to eliminate excess nitrogen, crippling bubbles form in the bloodstream, causing the bends.

In fish a similar problem is called gas bubble disease. As fish move from one area to another there is a tendency for their blood supply to maintain a balance with the nitrogen and oxygen concentrations in the water. If the fish has been living in supersaturated water, its blood supply contains the same supersaturated concentration levels as the stream. This is generally not a problem until the fish moves to water of different pressure, such as when it rises to the surface. At that point, there is a natural release of the excess gas via bubbles.

The spectacle of Columbia/Snake river fish exposed to the disease attracted widespread attention. "The results are horrible and deadly," noted a writer in *Outdoor Life* in 1972. "In a heavily afflicted fish, bubbles of free nitrogen appear under the skin and in the fins, tail, and roof of the mouth. Eyes protrude or hemorrhage, and in extreme cases they are actually blown out of the head. Fish blinded in this dreadful manner have been known to live long enough to beat themselves to death against the concrete barrier of a dam that they could no longer see." [24]

It was a true statement, but in its sensationalism it missed the main point. Most fish suffering from gas bubble disease never show symptoms. Air pockets simply block blood vessels, killing fish before bubbles form on exterior surfaces, leaving no signs. In addition, the disease kills in other ways. Fish surviving one dose of supersaturation are more prone to die from it the next time. Even if the nitrogen supersaturation does not kill, it damages tissues, making fish more susceptible to infection and predation. Gas bubble disease strikes adults as readily as juveniles.

During equilibrium, a stream is 100 percent saturated with air. Supersaturation is anything over that. Fish have the ability to survive a little increase. But in 1969 and 1970, Northwest scientists began recording intolerable levels of supersaturation: nearly 130 percent along the lower Snake and Columbia down to Portland; nearly 150 percent once below McNary Dam. Fish agencies had originally recommended that the Corps pass water over its spillways to aid juvenile fish going downstream. But now they realized this only increased supersaturation.

With John Day, Lower Monumental, and Little Goose dams all coming on line within two years of each other, the river quickly became a deadly highway. The Corps constructed all the dams with empty turbine bays, awaiting the time when increasing electricity demands would dictate the need for more generators. The Corps knew that to allow the full volume of the river to rush through empty turbine bays would structurally damage them. Because of this, the Engineers could not direct all water through turbines or turbine bays, after which it would have entered downstream without a splash. Instead, some had to go over spillways, supersaturating the river. The slackwater so conducive to barge travel allowed no opportunity for gas to escape, and the cumulative effects of the new reservoirs proved fatal for thousands of fish as nitrogen levels increased from dam to dam. The highest levels of supersaturation also occurred at just the wrong time. As migrating fish attempted to make their way up or downstream, the dams discharged millions of gallons of

spring run off. By 1970, after Little Goose started operation, the National Marine Fisheries Service estimated that supersaturated gases killed 70 percent of Snake River smolts.

State fishery agencies had warned of various fish passage problems at Ice Harbor as early as the 1930s, but they had never attracted grassroots support. Fears of mass deaths due to nitrogen supersaturation brought out many critics. They claimed that the Corps should have foreseen the difficulty. "The nitrogen problem is not new," charged Annette Tussing in a *Field and Stream* article. "Its supersaturation at dams has been recognized for fifty years. . . . But the Corps wasn't listening." [25]

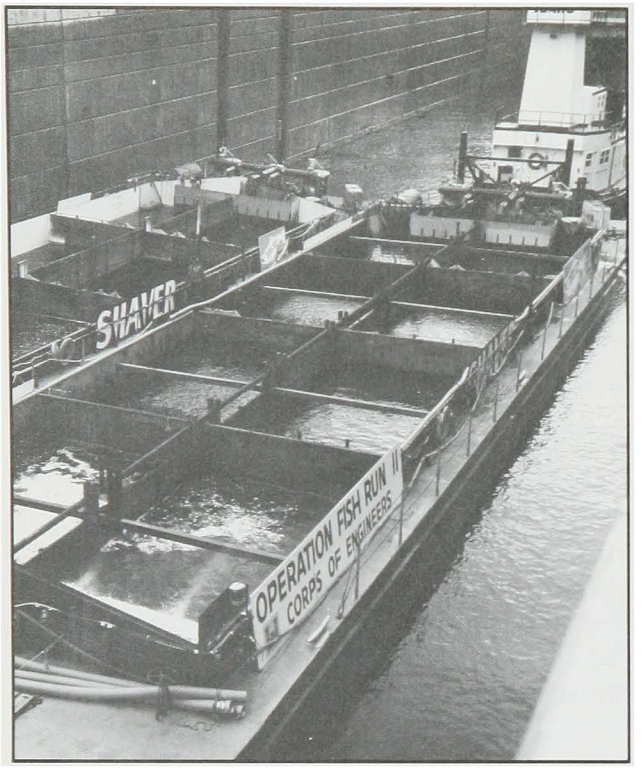
Actually, embryonic, but little publicized, studies of gas bubble disease dated as far back as the 1850s. But the first scientific paper on the potential danger of gas bubble disease at Columbia River dams did not appear until 1966, and researchers really did not know the severity of the problem until water flowed through John Day Dam in 1968. [26]

John Day was not really complete in 1968, and that led to the trouble. The Corps filled John Day's reservoir, but had not completed turbine installation. All water flowing downstream went over the spillways, supersaturating the river below. An estimated 20,000 adult chinook salmon died, and a large number of them washed ashore or floated downstream for all to see. Scientists now began studying gas bubble disease with renewed energy. Indeed, most of what researchers have learned about supersaturation came after the events at John Day in 1968. The Corps sponsored many of these studies and experimented with methods to alleviate the problem. While the press continued to chastise the Engineers, most fishery people noted that the agency worked as fast as it could to find a solution. [27]

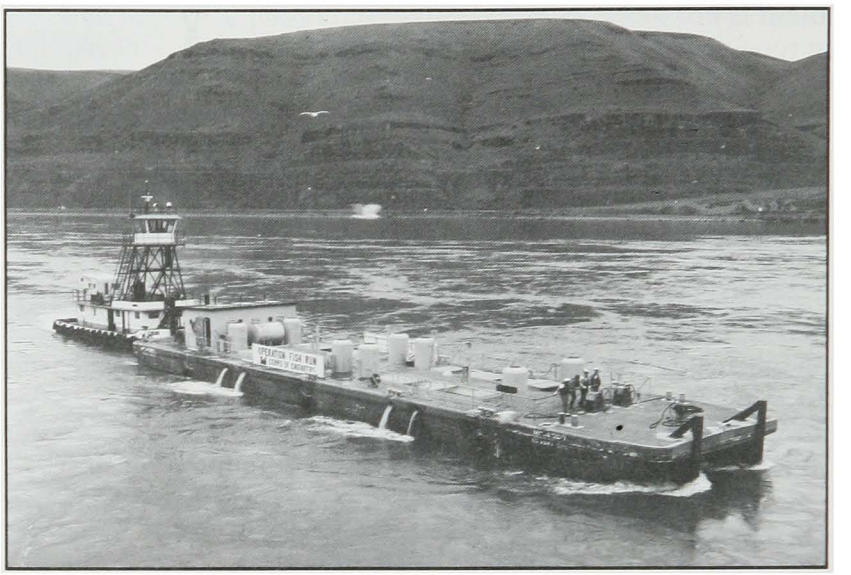
With Lower Monumental and Little Goose nearing completion, the Corps and scientists knew these dams would increase the nitrogen supersaturation problem. The Corps and fishery agencies investigated both short and long–term remedies. They came upon a partial solution: never put a dam into operation without at least one turbine in place, enabling some water to ease through the dam rather than crashing over it. But the Corps wanted to do more along the Snake. The Corps had built each lower Snake dam with three empty turbine bays in anticipation of future power needs. Walla Walla District Engineer Colonel Richard Connell now urged the North Pacific Division to "strongly push to have all additional [turbine] units funded on an expedited basis." But Congress proved unwilling to release the millions of dollars this would cost, and installing only a turbine or two at Monumental and Goose would not entirely solve the problem. So the Corps and scientists tried to find other remedies. [28]

A solution the Corps originally thought to be temporary proved so successful it became permanent. The National Marine Fisheries Service transported juvenile fish by truck, airplane, and barge past Snake and Columbia dams and the danger of supersaturated waters, releasing them below Bonneville. First undertaken experimentally in the late 1960s, the program eventually became known as Operation Fish Run. Successful though it was, Operation Fish Run did not aid upstream migrating adults and did not help smolts that escaped collecting facilities. It was only a partial remedy to supersaturation. Research continued. [29]

The Corps knew it could eventually solve the problem by regulating spring flows at upstream dams like Dworshak on the Clearwater. But in the late 1960s and early 1970s, with its upstream projects not yet completed, the Corps could not control the river, and it needed a more timely short–term solution to prevent the deaths of millions of fish.



The Walla Walla District began expanding the experimental Operation Fish Run in 1977, instituting a policy of transporting fish by barge.



Operation Fish Run barge.

The Corps and researchers thought they had struck upon the ideal solution with perforated bulkheads. Designed primarily by the Walla Walla District, the massive, multi–million dollar steel gates allowed excess water and fingerling fish to pass through unused turbine bays instead of over spillways, thus dissipating the water's energy and lowering nitrogen levels. The bulkheads, which the Corps dubbed "holey gates," worked well in model tests. But sometimes David–scale models do not reflect reality at Goliath–size dams. Rushed into place at the insistence of politicians, the public, and fishery agencies, the holey gates caused the Corps much grief. While the IEWA and fishery agencies encouraged a crash program for the gates, Northwest representatives maneuvered funding through Congress. The Corps installed them at Little Goose, Lower Monumental, and Ice Harbor. They performed admirably in reducing nitrogen supersaturation. "Everything looked fine . . . for awhile," noted the Corps. But as an Environmental Protection Agency official later summed up, "We fell on our faces." [30]

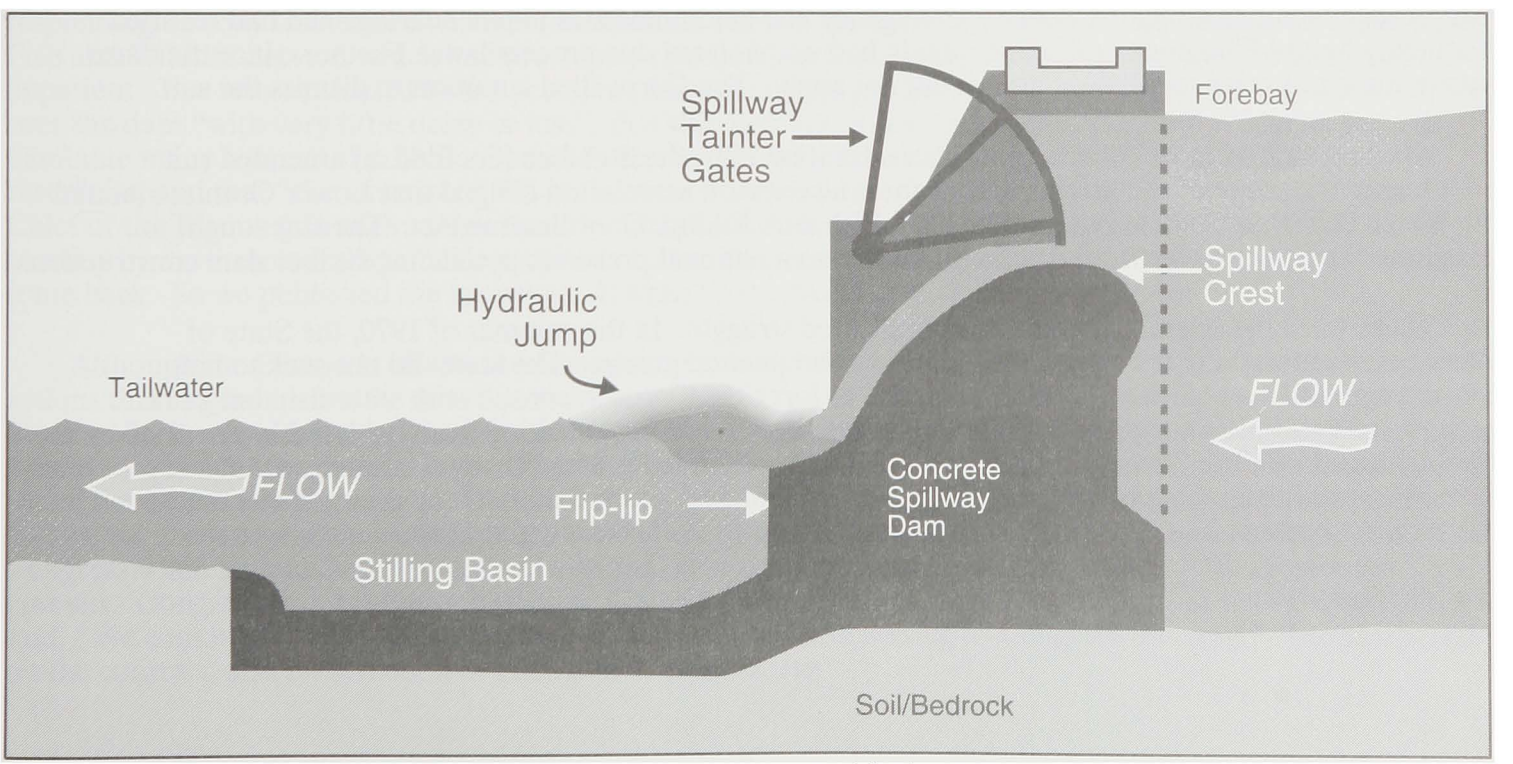
Although the holey gates lowered nitrogen levels, they proved lethal in other ways. Fish sucked through the gates experienced dramatic changes in water pressure and velocities, oftentimes emerging on the other side of the dam dazed and injured. The National Marine Fisheries Service speculated as many as 50 percent of fish passing through the gates died, and the Corps removed the bulkheads, once again upsetting impatient observers. Long–time dam supporter, Oregon Senator Bob Packwood, who had worked hard to secure money for the project, rebuked the Corps:

I am distressed. . . . I have consistently expressed my concern to the Corps about the nitrogen problem and frequently questioned if the bulkheads were indeed the real solution, pointing out the great cost involved. . . . The slotted bulkheads obviously were not as practical as anticipated, and we are now faced with continued high waters, high spills, and physical fish damage if the bulkheads are utilized, and supersaturation of nitrogen if they are shut down. Either way we and the fish suffer. . . . We have wasted both time and money. [31]

The Walla Walla District continued to research other ways to solve supersaturation. Finally the Corps and fisheries agencies hit upon a better solution, giving it another catchy name, "flip lips." Flip lips are ledges installed on spillways just below the tailwater surface. Except for very infrequent floods, water rushing over the spillway is directed along the flip lip surface and disperses horizontally, settling over large areas of the river and dissipating nitrogen. With evidence from both model and prototype studies that flip lips worked, the Corps began installing them at its dams. But, by now, it was 1972. A lot of supersaturated water had passed over the dam.

"I have to go all the way back to the slaughter of the buffalo to match the kind of total wipe–out that is threatened in the Columbia," said Tom Knight, information officer for the Washington Department of Game. "And it took longer to finish off the buffalo." [33]

It appeared for a time he was right. In 1969, an estimated 20 percent of chinook juveniles migrating downstream died from gas bubbles. In 1970, the estimated kill reached 70 percent, while biologists stated that more than 30 percent of steelhead smolts showed symptoms of the disease. At those levels scientists estimated about two–and–a–half million salmon, one million steelhead, and 40,000 game fish––perch, bass, sturgeon––died in one year. [34]



Cross Section of typical Snake River dam spillway showing tainter gates and flip lips.

Some questioned the accuracy of the figures. Two decades after the supersaturation crisis of the early 1970s, Willard Sivley, the former Chief of Walla Walla's Engineering Division, called the fish kill statistics "gross estimates of a very questionable character." But everyone agreed nitrogen supersaturation killed some smolts. And many expressed more alarm than Sivley. "Two more years like 1970 and the salmon and steelhead fishery may become a thing of the past," warned Idaho's Governor Cecil Andrus. He joined Oregon's Governor Tom McCall and Washington's Dan Evans in petitioning Congress and the president for immediate relief. [35]

Of all those concerned about the nitrogen deaths, none proved more of a thorn to the Corps than Arthur Solomon of Spokane, president of the Northwest Steelheaders Council. "Our fish are dying by the thousands every day," he claimed. "The Columbia River system is suffocating." Arthur Solomon and the Steelheaders had been concerned about declining fish runs for some time. But the increased deaths due to gas bubbles convinced them to take aggressive action to preserve anadromous fish runs on the Columbia and Snake. Their solution: sue the Corps of Engineers. [36]

In March 1970, the Association of Northwest Steelheaders and seven other conservation organizations filed suit against the Corps, seeking to halt construction at Lower Granite and deauthorize Asotin Dam, planned for the Snake River above Lewiston. According to the Steelheaders' complaint, construction of these dams violated citizen rights to due process guaranteed by the Constitution, as well as rights protected by the National Environmental Policy Act of 1969 (NEPA). The Corps, they asserted, failed to report to Congress the "well–founded objections of scientists . . . and informed citizens to the dams." [37]

The Corps protested the charges. It pointed out that it had spent millions of dollars on fish research and fish passage facilities along the Snake. The agency had held numerous public hearings and had testified frequently before Congress, and consequently had not violated due process laws. Further, since the dams were authorized prior to NEPA, that law did not apply. The Corps filed a motion to dismiss the suit.

After reports of the 1970 nitrogen supersaturation kills, the Steelheaders filed an amended suit broadening the scope of the original. Now the conservation association alleged that Lower Granite violated the Water Pollution Control Act and the 1958 Fish and Wildlife Coordination Act. The suit sought to designate the Snake River from Asotin to Almota as a national preserve, precluding further dam construction.

These were the opening salvos in a complicated struggle. In the summer of 1970, the State of Washington entered the lawsuit on the side of environmental groups. The state did not seek to halt construction of Lower Granite; rather it wished to force the Corps to consult with state fish and game agencies to determine adequate compensation measures for losses resulting from its dams, as required by the 1958 Fish and Wildlife Coordination Act. The Corps contended it had already consulted with fishery agencies, specifically the United States Fish and Wildlife Service, and that, in any event, it was not bound by the 1958 act because Lower Granite authorization came in 1945, before that act became law. [38]

It was, perhaps, an unprecedented move, a state agency suing a federal agency over protection of fish. The state's entry into the suit came partially because of politics, believed Walla Walla District biologist Ray Oligher. The fishery agencies often felt compelled to make exaggerated statements to appease their constituents. "We had monthly meetings with federal and state agencies," he recalled. "During the official meeting they would chew us out royally. Then after the official meeting adjourned, we'd get down to work and decide what we could and should do." But Washington Department of Game officials proved particularly outspoken in this instance. "It is our position that the Corps has consistently ignored the Coordination Act," said State Game Director Carl Crouse, "and in so doing has not given proper recognition to the mitigation of fish and wildlife losses." [39]

It was strong language and a blatant legal move guaranteed to generate a response from those who had worked years for completion of the inland waterway to Lewiston. Port districts in Idaho threatened to file a counter suit. Chambers of Commerce passed resolutions condemning the State of Washington. The IEWA filed a brief in Federal Court opposing the lawsuit, claiming that stopping work at Lower Granite would cause severe economic setbacks. [40]

The Corps of Engineers also embarked upon a public relations campaign that included offering to supply information to dam supporters willing to write letters to newspaper editors; establishing a speakers' bureau of "local opinion molders"; and encouraging pro–development groups such as the IEWA to send news releases detailing why they favored the dams. The District's Real Estate Division suggested that Walla Walla's Public Affairs Office produce a movie of the Lower Granite shoreline as it existed in 1970 to "show the present violence to the environment from cattle feed yards, slaughter houses, auto junk yards, decrepit houses and buildings, trash and garbage dumps . . . and other pollution and filth problems . . . explaining how we will eliminate these problems by construction of Lower Granite." [41]

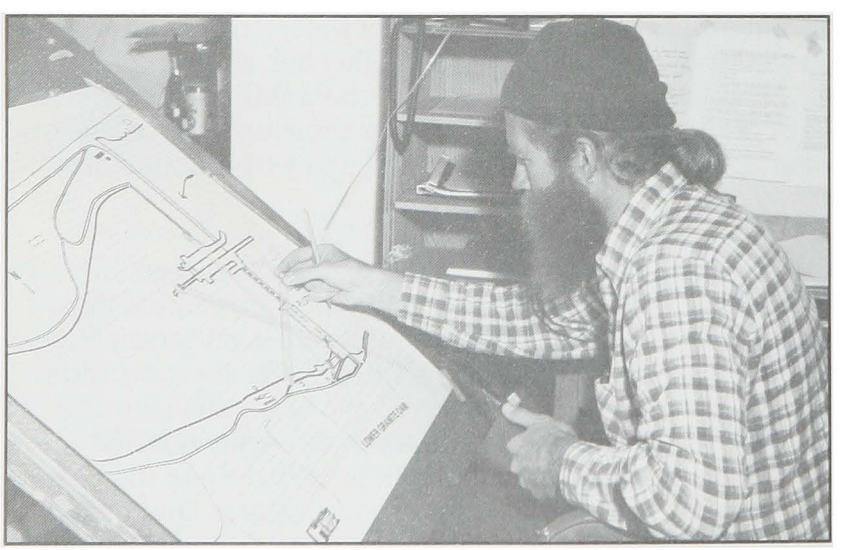
These efforts might not have generated much controversy, but when the Corps published a brochure responding directly to the Steelheaders' accusations entitled *Facts About Lower Granite Project*, even the U.S. Fish and Wildlife Service, which had previously remained on the sidelines in the lawsuit and debate, grew impatient. In a letter released to the press, the Service challenged the Corps' assertions that it could pass fish over the dam "with very little delay or loss"; that the dam would not "adversely affect water quality but will eliminate many sources of pollution"; that fishermen would still be able to catch steelhead in slackwater reservoirs; and that "the amount of fish in the river is expected actually to increase." Said Willard Sivley, Chief of the Planning Branch at that time, looking back at this period when the Corps came under increasing scrutiny by environmentalists: "We got tired of so many people taking pot shots at us and we wanted to take some back. So we published the brochure. It wasn't too smart." [42]

Although the District's efforts at persuading public opinion largely failed, it did undertake successful actions that helped insure the dam's completion. The Corps filed a number of legal motions to dismiss the Steelheaders' suit. More significantly, it refused to slow construction while the complicated legal proceedings wound their way through the courts. "To delay [projects such as Lower Granite] pending final court decisions, where we expect to eventually prevail on the merits of the case, would be contrary to the best public interest and would encourage more vexatious law suits seeking to stop or delay other projects," the Army notified Congress when announcing it intended to award the main dam construction contract in 1970 despite the lawsuits. Congress never requested that the Corps halt progress at Lower Granite, and as Harry Drake later said, "We couldn't let every objection prevent the job from progressing as Congress directed." The Corps did let the contract, and construction began again in earnest. [43]

As workers built the dam, lawyers debated the legality of that construction. In December 1971, Federal Judge William Goodwin dismissed the lawsuit against the Corps. "It is within the province of the Congress . . . to proceed, to alter or to stop construction," he wrote. But "it is beyond the power of this court to determine what course the Congress should follow." Lower Granite was by then nearly 50 percent complete. The state and Steelheaders appealed, claiming courts did have jurisdiction over federal actions violating NEPA or the Fish and Wildlife Coordination Act. As the Steelheaders' attorney admitted when first filing the suit, "there is no case law interpreting" NEPA. The Corps, the plaintiffs, and the courts were in untested legal territory. [44]

In 1973, the U.S. Court of Appeals reversed the lower court decision and urged plaintiffs to reinstate their suits. With the dam now nearing completion, the Steelheaders and State of Washington filed again. Finally, in 1977, U.S. District Judge Manuel Real ruled largely in favor of the Corps, primarily because the issue had become "moot for the reason that the four dams on the lower Snake river have been constructed and are in operation." The Corps' decision to continue construction despite the lawsuits proved an effective strategy. The judgment did not entirely favor the Corps, though. Finding that the Corps had inadequately studied and reported on fish and wildlife resources, the judge ordered it to file supplemental reports regarding plans to enhance lower Snake fish runs. Judge Real, in other words, required more than mitigation for losses. He also ordered that fish runs be enhanced. For a few years, the Corps complied with the judgment, funding studies to determine enhancement concepts. Then, in the early 1980s, President Ronald Reagan's Office of Management and Budget eliminated the money, terminating the Corps' enhancement studies. [45]

Still, after all the years of litigation, the Steelheaders could point to some success. They had not stopped Lower Granite, but some in the Association never thought that possible: the dam was too far along by the time the suit began. Upstream from Lower Granite, Congress had authorized the Corps to construct another dam at Asotin. To many parties in the suit, the main objective was to halt this structure, and no doubt the Steelheaders' case helped turn public sentiment against Asotin Dam, eventually leading Congress to deauthorize that project.



Tracking fish at Lower Granite by two–way radio and sonar equipment.

The lawsuit and changing environmental attitudes also convinced the Corps to listen more closely to public concerns about natural resources. Even those who had sued recognized differences in the agency in succeeding years. In 1973, Steelheaders President Arthur Solomon praised the Walla Walla District for its "important change in attitude," and two years later Washington's Department of Game commended the District for its efforts to "actively seek and secure involvement of public and private agencies, as well as concerned citizens" in natural resource planning. [46]

Looking at the situation with hindsight, there was never much chance environmentalists would halt Lower Granite construction. Unlike the struggle at Ice Harbor, this outcome was never seriously in doubt. The Corps had proceeded too far to turn back. Idaho would get its seaport, bringing changes to the region.

Perhaps the biggest alteration came to the landscape of Lewiston. Besides the economic advantages and expanded port facilities that slackwater brought, Lower Granite created a distinct new look for the town.

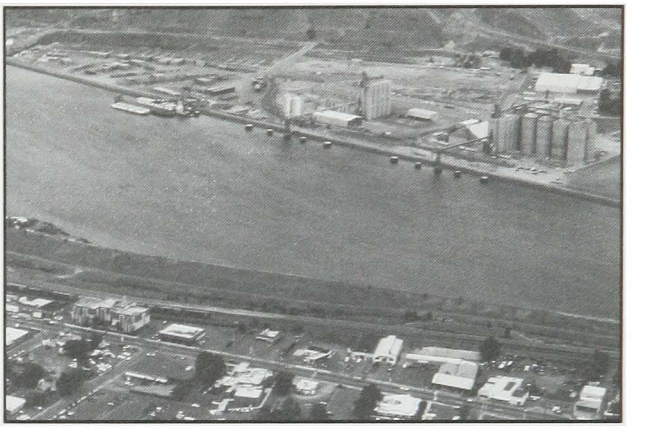
Congress authorized a system of levees around Lewiston in its 1945 act approving the lower Snake project, to provide protection from slackwater rising behind Lower Granite dam. In 1948, when Lewiston suffered considerable damage during the second greatest flood in the town's history, residents asked for immediate levee construction to prevent additional flooding. Local governments eventually declined to participate in funding a levee system, however, claiming they could not absorb their share of construction costs. In the late 1950s, the Corps again added a levee system to its Lower Granite project plans to serve the dual purpose of flood relief and protection against reservoir backwaters.

As Lower Granite construction progressed in the early 1970s, the Walla Walla District entered into long deliberations with local residents concerning the levees. Some people feared the levees would be so high and unsightly they would make Lewiston appear as a fortress. They questioned whether the Corps really needed a Lower Granite pool as deep as had been designed. By lowering the pool, they believed Lewiston could have more modest and visually pleasing levees. The Corps pointed out that the levees required to hold back reservoir waters were only a few feet higher than those necessary simply for flood protection, and contended that the higher pool elevation would improve port conditions in Lewiston and Clarkston by establishing 15–foot channel depths consistent with those downstream. After seeking local opinion, the Walla Walla District produced a design for higher levees that pleased virtually everyone.

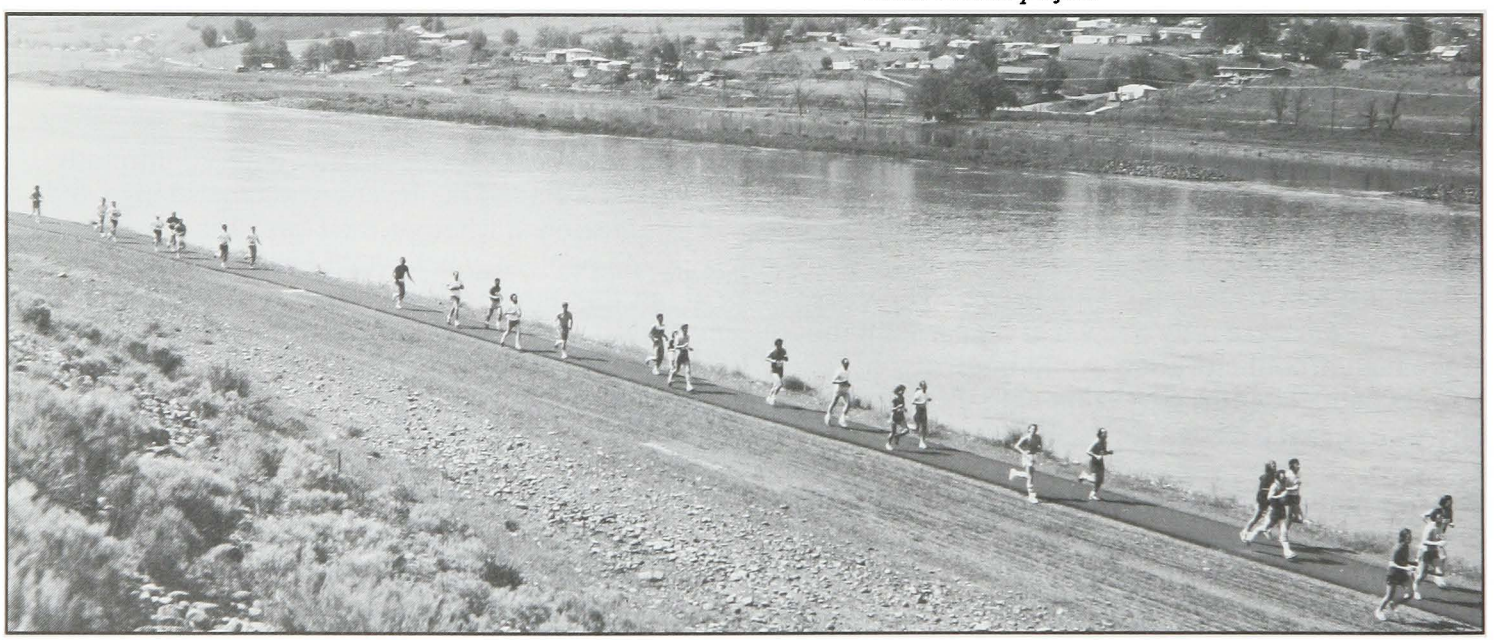
After numerous public meetings, Lewiston residents nearly unanimously supported the high levees. But they wanted more than a series of ugly dikes. They wanted, in effect, a long riverfront park, beautification as well as protection. A few business people opposed turning the entire levee system into a parkway, favoring instead an industrial zone along the shoreline. But theirs was a minority voice once the Corps began unveiling its plans.

And those plans were grandiose. Indeed, they were unique in the nation. The Corps constructed ten miles of levees at a cost of nearly $20 million, with hard–surfaced trails for runners, skaters, walkers, and bicyclists. The levee system contained three parks, three visitors' centers, and numerous places to picnic, swim, fish, and sit. The levees were, as the *Lewiston Morning Tribune* wrote, an "example of what [the Corps] can do when it sets its mind to beautification." Designated as the Clearwater and Snake River National Recreation Trail in 1989, the levee system attracted 312,000 visitors that year, testimony to the significant role they had come to play in the Lewiston/Clarkston valley. [47]

Lewiston residents began requesting levees for flood protection shortly after the town's 1894 flood.



Eventually, the Walla Walla District constructed a levee system combining flood control and recreation as part of the Lower Granite project.



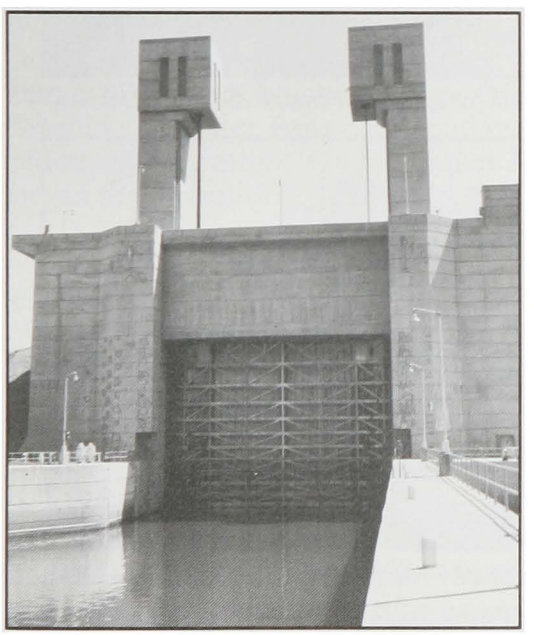
The Lewiston levees instantly became popular with walkers, runners, bikers and other recreationists.

Perhaps no one took greater pride in the levees than the Walla Walla District's Engineering Division Chief, Harry Drake. Drake came to the District in 1948 when it had about 25 employees. "My first job was to coordinate levee construction at the Tri–cities," he later reminisced. "We built them well. They're functional––but not much to look at. Lewiston people wanted nothing like that." Willard Sivley worked under Drake in those days and later replaced him as Chief of Engineering. "Our landscape architects pushed the idea of beautiful levees and Harry Drake was anxious to buy it," he remembered. Drake, who retired in 1973, began his career with the District designing purely functional levees, and ended it approving a unique recreational system that brought Lewiston both function and beauty. [48]

The levee project posed one of the more unusual design tasks for the Corps along the lower Snake, but the four–dam system had presented other challenges. When the Corps committed itself to building only four dams between Pasco and Lewiston, the Engineers also opted for a system of navigation locks 50 percent higher than any existing in the world in the late 1940s. "When you look at the Mississippi or Ohio rivers, you're looking at locks with maybe twenty feet of lift," noted Sivley. By the time the Engineers completed Ice Harbor in 1962, they had built the highest single–lift lock in the world, more than 100 feet high.

When the Corps began work on the lower Snake, lock design commonly employed double–leaf miter gates. These hinge on either side of a navigation lock to allow vessels in and out. But the Engineers feared that, because of the size of gates needed along the lower Snake, double gates would not provide the rigidity required. In addition, the Corps could shorten the length of the lock structure if it installed a vertical–lift gate, thus saving money. As a result, the Engineers adopted the concept of single–slab, vertical–lift gates. The one at Ice Harbor weighs 1.4 million pounds. The system worked so well that the Corps installed similar huge single gates at Lower Monumental and John Day, the latter eclipsing Ice Harbor as the world's highest. But the Corps experienced some problems with the gates. It proved time–consuming and expensive to complete adequate welds on the high–strength steel. Trash accumulated around them, ice build–up made them heavy to lift, and the monolithic structures dripped considerably on vessels passing underneath. Additionally, machinery for the gates required more maintenance because of the gigantic system of counterweights needed to raise and lower them. By the time the Corps built Little Goose and Lower Granite, it had returned to the more traditional twin–gate concept. [49]

Building four instead of six or ten dams not only made it necessary to increase the height of the navigation locks, it also meant higher navigation pools. Consequently, the Corps found itself undertaking much expensive relocation work along the lower Snake. Although few people lived along the river, railroads and a few highways ran along its shores, and a couple of bridges crossed over. All had to be moved or abandoned to rising waters. Railroads posed the biggest relocation challenge.



Ice Harbor navigation lock and bridge, 1978.

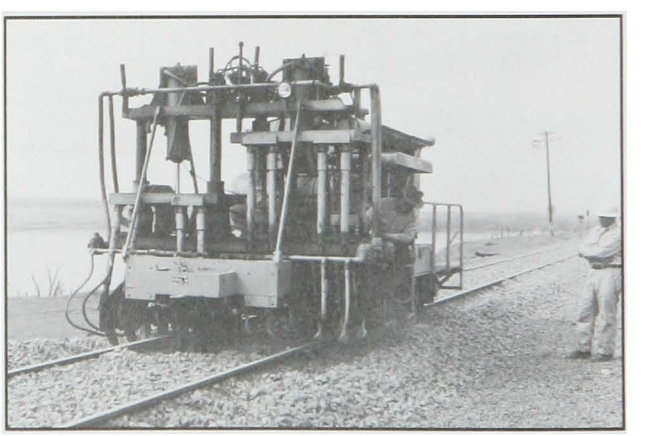
Tug and barge in Little Goose navigation lock, 1979.

At the time the Corps began construction, a variety of railways operated on tracks adjacent to the river: the Northern Pacific, the Union Pacific, the Spokane, Portland and Seattle, and the Camas Prairie. Railroads waged a fight over the lower Snake project, and eventually lost. However, they refused to relinquish the field once slackwater arrived. The Corps of Engineers initially proposed several ways to minimize railroad relocation, including consolidating services along one line and abandoning several lines in favor of freighting supplies circuitously around the Snake on existing track. The railroads balked at virtually all such talk. Ironically, they found allies in the open river developers they had long battled concerning lower Snake River improvements. Port districts and development organizations like the IEWA defended the railroads and requested the Corps to relocate rather than condemn the rail lines. The open river advocates wanted barge transportation, but not, as it turned out, at the expense of losing rail service.

The Corps did convince the Union Pacific to abandon 30 miles of track on the river's north shore in favor of using the south shore's Union Pacific line between Snake River Junction and Riparia. But all other efforts at encouraging railway abandonment or consolidation failed. In the end, the Corps relocated more than 160 miles of track and built or strengthened four railroad bridges over the river, all at a cost of tens of millions of dollars, one of the most expensive components of the entire project. [50]

First freight train over the newly relocated tracks, 7 May 1958.


Relocation track for Spokane, Portland & Seattle Railroad.


Tie tamper working on SP&S track relocation, May 1958.

Highway relocations posed less of a problem because the lower Snake was so sparsely populated. Indeed, a more serious difficulty proved to be constructing access roads to the isolated dam sites. This necessitated the building of a temporary bridge across the river at Lower Granite, and grading and constructing numerous access roads there and at the other three dams. Indeed, once the Corps completed the dams, these access roads provided some of the few means of getting across the river, and the dams themselves became convenient bridges for people who formerly had to travel long distances to get from one river bank to the other.

There were places, however, where existing highways had to be relocated. Because Lower Granite Reservoir flooded the most heavily used route along the river, the Corps had to relocate more than 40 miles of state and county roads in that reach. At Central Ferry, the Corps had to blast the existing bridge, then the river's only highway crossing between its mouth and Lewiston, sinking it under the water and replacing it with a much higher, multi-million dollar span. At Lyons Ferry, the Corps replaced the last ferryboat on the lower river with a used bridge shipped in from eastern Washington. [51]

In addition to the Central Ferry bridge, the Corps found it necessary to remove another historic structure--a dam. As District Engineer Colonel Richard Connell noted in December 1972 when inviting dignitaries to witness the demolition, "It isn't every day that the Corps of Engineers tears [a dam] down." The Corps would also be doing something else rather unusual: restoring about six miles of river to its free-flowing state.

The Washington Water Power Company had constructed the dam on the Clearwater River just upstream from Lewiston in 1927. The dam would have lost generating capacity because of Lower Granite Reservoir water backed up to it, reducing its hydraulic head. Rather than construct an expensive levee system up the dam tailrace to permit the powerhouse to continue operating, the Corps entered into protracted negotiations with the the power company and Lewiston's Potlatch Corporation, a forest products firm. The three parties eventually reached an agreement whereby the Corps and Potlatch would buy the dam and power plant from Washington Water Power Company. The Corps would remove the spillway, saving money because it now did not need to construct a special levee system for the dam. Potlatch gained use of the former log pond area the dam had created, which had since dried up, and there the company built a large waste disposal plant. The Washington Water Power dam had inadequate fish passage facilities. Removing the dam, therefore, also aided fish migration. On December 28, 1972, Idaho Governor Cecil Andrus ceremoniously set the switch that began the demolition. [52]

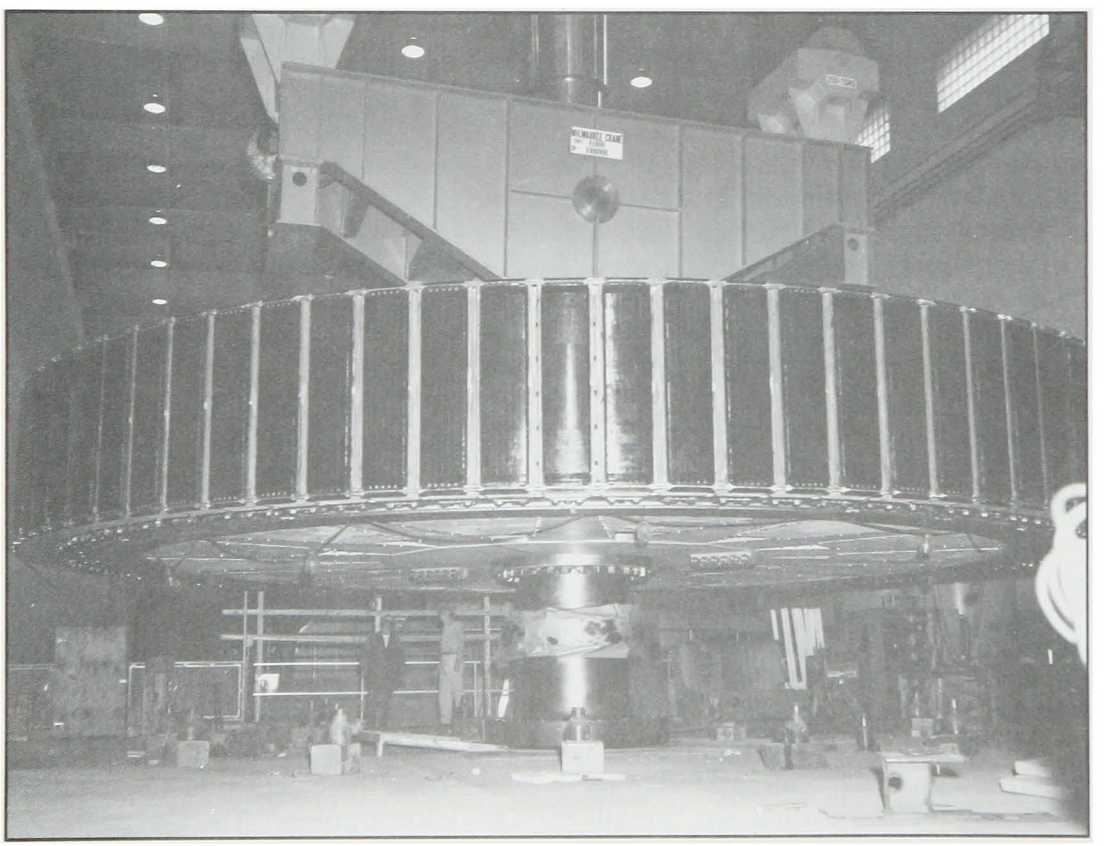
Because of the length of time required to complete a massive project like the lower Snake River dams, engineering and design concepts concerning water resources development often change. They did for the Walla Walla District, particularly in regard to fish passage. Dams that began with ladders only for adult passage were eventually fitted with extensive and expensive passage for migrating juveniles as well. The Corps developed this state-of-the-art equipment on a scale equalled nowhere else in the world. [53]

Over the years, the Engineers also constantly had to adapt dam powerhouses to meet growing energy needs. For example, when Congress authorized the dams in the 1940s, the Corps was to install three 65,000-kilowatt units in each dam. In addition, the Engineers were to make space for two additional 65,000- kilowatt units to be added when demand required. By the 1950s, when the Corps began construction at Ice Harbor, these generating capacities had been increased to 90,000 each, and the Engineers had to provide facilities for three additional units at each dam instead of two. By the time the Corps finished construction along the lower Snake, only Ice Harbor had the "small" 90,000-kilowatt units. The Corps installed the other three dams with three units of 135,000 kilowatt capacity each, then, in the 1970s, it added three 110,000-kilowatt units at Ice Harbor and three additional 135,000-kilowatt units at each of the other dams.

Originally authorized to generate 780,000 kilowatts, the lower Snake project today has a peak generating capacity of more than three million kilowatts. This dramatic increase in generating capability resulted from better and more efficient turbine and hydraulic design, while using the same amount of water. [54]

Any massive construction project such as the one the Corps undertook along the lower Snake presents unusual engineering and design challenges. The Corps introduced several innovations, particularly in its design of award–winning levees at Lewiston, in fish passage, and in constructing what were, at the time, the world's highest navigation locks. But the Corps of Engineers was an experienced dam–building agency. It had constructed bigger dams along the Columbia and elsewhere, and had often faced more complex challenges. Still, it is never an easy task to dam a river the size of the Snake. A brief look at the construction history of Lower Granite can provide a case study of the amount of work the Corps had to do along the lower Snake. [55]

Construction of Lower Granite began in 1965 when the Corps let a contract to construct a cofferdam to divert the river. The cofferdam consisted of thirty-two circular metal cells, each about forty feet in diameter, sealed at the bottom with cement and sandbags, and filled with gravel. Two earthfill wings tied the cells to the south river bank, thus encompassing the work site. Pumps kept the site dewatered. The cofferdam stood alone until 1970 before main construction began, due to lack of adequate funding. Not all work stopped, however. The Corps awarded contracts to relocate roads, to build a resident office, to remove trees from the reservoir area, and to relocate burial graves. Finally, in May 1970, the Corps awarded the main job, a $105 million contract to a consortium of firms that had entered into a joint venture agreement under the convenient name "Lower Granite Contractors."



Installation of unit number 5 rotor, Ice Harbor Dam, 1975.

The contractors first built a service bridge about a mile upstream from the dam site to provide access to this remote work area from both sides of the river. Workers at Lower Granite came from a number of communities on both sides of the river: Lewiston, Dayton, Clarkston, Pomeroy, Pullman, and Moscow, among others.

Actual dam construction began when workers wheeled dump trucks, loaders, dozers, and drills onto the work site--actually the former river channel before the cofferdam diversion--and began excavating earth and rock for the dam's foundation.

In 1971, the contractors installed five huge construction cranes at the site, and work began in earnest. They laid the first concrete in the future navigation lock in February. By the end of the year, workers had placed more than 900,000 cubic yards of concrete in the navigation lock and powerhouse.

In February 1972, the Corps organized a ceremony commemorating the one millionth cubic yard of concrete being placed, and by the end of the year workers had set more than 1,600,000 cubic yards. They began building the fish ladder in July, as they neared completion of other of the dam's concrete structures. Contractors by then had more than 1,000 workers at the site, the peak of the operation. Mechanical construction began to take shape: the navigation lock gates were being assembled, turbine pit liners installed, and spillway gates erected.

By the fall of 1973, most concrete operations at Lower Granite were complete, with 1,770,000 cubic yards in place. In December, a barge-mounted crane began pulling out the cofferdam cells. With the fishways working, the Corps routed the river flow through the skeleton dam bays. Workers installed hydraulic turbines and generators, which had been in separate fabrication for several years. After spring river flows subsided in the summer of 1974, workers began constructing an earthfill embankment of more than 2 million cubic yards, connecting the concrete portion of the dam with the north bank of the river. By December the contractors had completed it.

On February 14, 1975, the Corps closed the intake gates in the powerhouse skeleton bays, stopping the Snake's flow. Over the next three days the reservoir rose to 733 feet, creating a slackwater pool to Lewiston, 34 miles upstream. On April 10, a barge loaded with asphalt storage tanks, bound for the Port of Wilma, passed through the navigation lock, the first upstream lockage. Five days later, Lower Granite began producing its first electricity, and by the end of the year, with touch-up painting and final details attended to, Lower Granite was essentially completed.

During construction, other contract crews relocated roads and railroads, drilled a well at the damsite, built levees at Lewiston, removed the Washington Water Power Dam, built recreation facilities, raised existing and constructed new bridges. By the time the project was complete, the Corps had let more than 130 separate contracts for supplies and work, at a cost of nearly $325 million.

Slackwater reached Lewiston on February 15, 1975, and Lower Granite generated its first electricity in April. The four lower Snake dams had cost nearly $1 billion to complete, but they produced enough electricity to meet the needs of thousands of people and businesses. In addition, the projects included recreational facilities dotting the shore from Pasco to Lewiston, provided irrigation for thirsty farm lands, and gave access to the Pacific Ocean.

On June 20, 1975, the sternwheeler *Portland* steamed to Lewiston, marking the end of three festive days dedicating the "Northwest Passage." Lewiston, at long last, became a seaport. It was the biggest river celebration since the completion of Celilo Canal in 1915.

A lot of dignitaries showed up, praising the system. The Corps of Engineers sent employees and officials, while the governors of Oregon and Idaho attended. Senators and representatives arrived from Idaho and Washington. Port districts, chambers of commerce, and the Pacific Northwest Waterways Association, recently renamed from the old IEWA, were all represented.

Perhaps the proudest attendee was Washington's Senator Warren Magnuson, who had battled and maneuvered for decades for this day. "The nay-sayers said it couldn't be done, shouldn't be done, and wouldn't be done," he boasted at Lewiston. "But over 35 years ago we planned for the future and during all the years since that time we have all worked together. And now today we can stand her in Lewiston — — over 400 miles from Bonneville where it all began in 1933 — — and we can tell the nay-sayers that we have succeeded where they said we would fail."

Idaho's Senator Frank Church added his accolades: "It is an achievement so exceptional that envious communities will forgive us as we all go aboard this month's pleasure cruise on the waters of self–congratulations. . . . A community that started from the deck of a wooden riverboat now welcomes home its descendants, the steel tugboats."

Idaho Governor Cecil Andrus claimed the navigable waterway "will enrich our daily lives through international trade."

Despite the concerns of many environmentalists over the lower Snake dams in the late 1960s and early 1970s, only three protestors showed up, carrying signs saying: "The Corps goes free, the Snake is dead"; and "Damn the Corps, not the rivers." No one paid much attention, but Idaho's Governor did add a somber note to the festivities. "Before I accept this structure," he said at Lower Granite, "I want to point out that the cost of this system has been horrendous, both in dollars and in cost to our natural resources." Andrus challenged Congress and the Corps to solve the problems of fish migration. "We should not wring our hands," he said. [56]

The National Society of Professional Engineers named the lower Snake River project one of the ten outstanding engineering achievements of 1975. The American Society of Civil Engineers (ASCE) proclaimed it the nation's outstanding water resources achievement that year, while the Pacific Northwest Council of the ASCE called it 1975's outstanding civil engineering achievement in the Pacific Northwest.

And so, after more than 100 years of effort, Lewiston became a seaport. It was a time of jubilation. But as Andrus noted, there remained some unfinished business. Tugboats could now make it upriver, but some people still worried about the effect on fish and animals. Could people develop a river while also assuring the preservation of wildlife? No one knew for sure in 1975, as the Walla Walla District and fish and game agencies prepared one of the most extensive fish and wildlife compensation plans in United States history. But by that time it was clear, as Walla Walla District Engineer Colonel C.J. Allaire noted, that "building the dams was the easy part." Now the Corps had to deal with the consequences of that construction. One campaign, to bring slackwater, had ended. Another, to preserve fish and wildlife, had really just begun. [57]

Completion of the four–dam Lower Snake River Project brought year–round navigation to the region. Here a log barge and a wheat barge pass under the railroad bridge upstream from Lyons Ferry, 1977.

Endnotes

[1] Harry Drake, interview with the authors, 27 Apr. 1992.

[2] *IEWA Log*, 12:1 (Jan. 1960).

[3] Magnuson to West, 27 Aug. 1960, cabinet VIII, drawer 1, "Lower Granite Dam," 1960–Present file, IEWA.

[4] The memorandum of understanding between the two districts, which became effective on 1 Jy. 1962, is in RG 77, Acc. #T77–85–0022, WWD files, box 21, Seattle FRC.

[5] Construction details can be found in Preston, *A History of the Walla Walla District, 1948–1970*, pp. 231–39; and Pasco *Tri–City Herald*, 28 Nov. 1962.

[6] For the movement to name the reservoir after Alice Whitman, see box 95, May papers. For Lake Herbert G. West, see *Walla Walla Union–Bulletin*, 16 May 1978.

[7] For the large contract, see news release from the Office of the Chief of Engineers, 15 Je. 1965. A copy is in box 161, May papers.

[8] For the Columbia River Treaty and the intertie, see John V. Krutilla, *The Columbia River Treaty: The Economics of an International River Basin Development* (Baltimore: The Johns Hopkins Press, 1967); *The Treaty With Canada: Handbook* (Portland: Bonneville Power Administration, 1965); Norwood, *Columbia River Power for the People*, pp. 227–46; and Gulick, *Snake River Country* , pp. 153–66.

[9] *Lewiston Morning Tribune*, 25 Apr. 1964.

[10] Ibid.; quotation in West to A.B. Martin, 17 Mar. 1964, cabinet VIII, drawer 1, "Lower Granite, 1960–present" file, IEWA. Also, see *Lewiston Morning Tribune*, edit., 15 Aug. 1964; and Portland *Oregonian*, 17 Dec. 1964.

[11] For BPA's 1965 estimates, see *The Treaty with Canada: Handbook*, p. 22.

[12] Preston, *History of Walla Walla District*, 1948–1970, pp. 241–49.

[13] The quotation is in *Lewiston Morning Tribune*, edit., 18 Dec. 1969. For early construction history, see Preston, *History of Walla Walla District*, 1948–1970, p. 253; and *Pullman Herald*, 23 Jy. 1970. For background on the continuing construction delays caused by the Executive Branch withholding funds, see Lt. Gen. Lewis Pick, Jr., Corps of Engineers, to Magnuson, 1 Mar. 1967, Acc. #3181–4, box 196, Magnuson papers; Catherine May to Paul Potter, Walla Walla, 22 Oct. 1969, box 342, May papers; and *Lewiston Morning Tribune*, edit., 20 Mar. 1969.

[14] *Washington Post*, 25 Mar. 1969.

[15] See *Lewiston Morning Tribune*, 26 Je. 1969; and, for the amount spent to 1969, Col. Robert Giesen, Walla Walla District Engineer to Magnuson, Acc. #3181–5, box 146, Magnuson papers.

[16] The quotation and good background on the Magnuson and Church positions is in a staff memo to Church, 15 Apr. 1969, series 3.3.3, box 49, Church papers.

[17] A copy of Hatfield's letter to Nixon, 14 May 1969, is in Ibid.

[18] *Lewiston Morning Tribune*, edit., 18 Dec. 1969; *Pullman Herald*, 23 Jy. 1970; Preston, *History of Walla Walla District*, 1948–70, p. 253.

[19] The quotation is in Jordan to Don Modie, Lewiston, 25 Mar. 1969. Also see Modie to Jordan, 4 Mar. 1969 and 31 Mar. 1969; and typescripts of two Thomas broadcast editorials aired in the spring of 1969. All in box 218, Jordan papers. For another early indication of changing sentiments, see Church to David Heusinkveld, Lewiston, 30 Jy. 1969, series 3.3.3, box 49, Church papers.

[20] Bill Behrens to May's office, 24 Mar. 1969, box 342, May papers.

[21] Drake interview.

[22] For the suggestion that the Lower Granite reach be included in a middle Snake moratorium see Richard Lee, Vice President, Association of Northwest Steelheaders to William Hall, *Lewiston Morning Tribune*, 22 Mar. 1969, RG 77, Acc. #T77–85–0018, WWD files, box 9, Seattle FRC.

[23] Information for this discussion of nitrogen supersaturation and gas bubble disease comes from the following sources: Carl Elling and Wesley Ebel, "Nitrogen Supersaturation in the Columbia and Snake Rivers––A Disaster or Blessing in Disguise?," typescript, 1973; and L. Richard Perry, "Supersaturated Nitrogen––Columbia River," typescript of testimony presented at U.S. House of Representatives Public Works Committee public hearing in Richland, Washington, 6 May 1972. Both of the above in Information Reference Papers Files, "Nitrogen Supersaturation Problem" folder, WWD PAO. Also see "Nitrogen Fish Kill Problem on Lower Snake and Columbia Rivers," informational release by Walla Walla District, Corps of Engineers, 31 Jy. 1970, cabinet VI, drawer 2Steelheaders vs. Corps" file, IEWA; Robert W. Schoning, "Nitrogen and Fish," typescript, 1971, Series 3.3.3, box 49, Church papers; and Norm Nelson, Jr. and Richard Furniss, "River on Its Deathbed," *Outdoor Life*, 149:4 (April 1972), pp. 61–3, 117–24.

[24] Nelson and Furniss, "River on Its Deathbed," p. 118

[25] Tussing, "The Fight to Save the Snake," *Field and Stream*, 76:6 (Oct. 1971), pp. 22–4, 126–7.

[26] For historical background on studies about nitrogen supersaturation see a report submitted to the Idaho Power Company entitled *Resource & Literature Review Dissolved Gas Supersaturation and Gas Bubble Disease* (Seattle: Parametrix, Inc., 1973); Donald Weitkamp and Max Katz, *Dissolved Atmospheric Gas Supersaturation of Water and the Gas Bubble Disease of Fish* (Mercer Island, WA.: Environmental Information Services, Inc., 1977); and a typescript of a North Pacific Division, Army Corps of Engineers public meeting held on 23 Mar. 1971, entitled "Nitrogen Supersaturation Problem." A copy is available at the University of Idaho library.

[27] For fisheries agencies' positive responses to Corps actions, see Donald Johnson, Regional Director, National Marine Fisheries Service to North Pacific Division, 13 Mar. 1973, copy in Information Reference Paper Files, "Nitrogen Supersaturation Problem" folder, WWD PAO. Also see Elling and Ebel, "Nitrogen Supersaturation in the Columbia."

[28] Connell to Division Engineer, 4 Jan. 1971, RG 77, Acc. #T77–85–0022, WWD files, box 18, Seattle FRC.

[29] Various methods of alleviating the problem in the late 1960s and early 1970s are discussed in Elling and Ebel, "Nitrogen Supersaturation in the Columbia," pp. 9–12.

[30] The first quotation is in a Corps' "Presentation to Snake River Editors Conference, 30 May 1974," in "Information Reference Papers" Files, "Nitrogen Supersaturation Problem" folder, WWD PAO; and the second is in Frank N. Schubert, "From the Potomac to the Columbia: The Corps of Engineers and Anadromous Fisheries," typescript, 1978, p. 77, available at Office of History, U.S. Army Corps of Engineers, Ft. Belvoir, Va. For Congressional efforts to obtain funding, see a joint news release from Idaho Senators Frank Church and Len Jordan and Congressmen James McClure and Orval Hansen, 29 Oct. 1970, in Series 3.3.3, box 49, Church papers. For IEWA support see *Portland Oregon Journal*, 31 Aug. 1971.

[31] Packwood, cable to Lt. Gen. Frederick Clark, Chief of Engineers, 31 May 1972, Civil Works Projects files, "Nitrogen Supersaturation Program," box 44, NPD RHA.

[32] For flip lips, see "Presentation to Snake River Editors Conference," 30 May 1974; Schubert, "From Potomac to Columbia," p. 78; and Preston, *Walla Walla District History, 1970–1975*, p. 64.

[33] Quoted in Nelson and Furniss, "River on Its Deathbed," p. 63.

[34] For statistics of the kills, see Ibid.; *Resource & Literature Review Dissolved Gas Supersaturation*, p. 14; Schubert, "From Potomac to Columbia," p. 71; and Tussing, "Fight to Save the Snake," p. 22.

[35] The Sivley quotation is in Sivley to WWD PAO, Dec. 1991, commenting on an earlier draft of this manuscript. The Andrus quotation is in Tussing, "Fight to Save the Snake," p. 22. For the Governors' petition, see McCall to Frank Church, 25 Mar. 1971, Series 3.3.3, box 49, Church papers.

[36] Quotation in Nelson and Furniss, "River on Its Deathbed," p. 63.

[37] For background on the suits and the Corps' dismissal motions, see Litigation Case File 410–01, "Steelheaders vs. U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service," WWD RHA. Good background on the suit and copies of the court complaints can also be found in box 216, Jordan papers.

[38] Background on the State of Washington suit can be found in cabinet VI, drawer 2, "Steelheaders vs. Corps" file, IEWA; Accession #79–7–480, Department of Fisheries papers, "Lower Snake River Compensation Plan" files, box 0061–76, Wash. Arch.; and RG 77, Accession #T77–85–0018, WWD Files, boxes 9 and 13, Seattle FRC.

[39] Crouse is quoted in *Seattle Argus*, 23 Oct. 1970. Oligher's quotation came in his interview with the authors, 12 May 1992.

[40] For the Port Districts' contemplated action, see *Walla Walla Union Bulletin*, 14 Jan. 1970 and *Salt Lake City Tribune*, 16 Jan. 1970. For the Clarkston Chamber of Commerce action, see *Lewiston Morning Tribune*, 10 Jy. 1970. For the IEWA brief, see IEWA news release, 10 Je. 1970, cabinet VI, drawer 2, "Steelheaders vs. Corps" file, IEWA.

[41] See "Meeting on Conservationists Attack," 9 Sept. 1969 and Max Tysor, Chief, Real Estate Division to Public Affairs Office, 27 Apr. 1970. Both in RG 77, Accession #T77–85–0018, WWD files, box 9, Seattle FRC.

[42] Donald Johnson, Regional Director, Bureau of Commercial Fisheries and John Findlay, Regional Director, Bureau of Sport Fisheries and Wildlife to Walla Walla District Engineer, 31 Aug. 1970, RG 77, Accession #T77–85–0018, WWD files, box 9, Seattle FRC; Division Engineer Brig. Gen. Roy Kelly to Johnson, 29 Sept. 1970, Accession #79–7–480, Department of Fisheries papers, "Lower Snake River Compensation Plan" files, box 0061–76, Wash. Arch. The District's brochure can be found in Series 3.3.3, box 49, Church papers. Willard Sivley, interview with the authors, 28 Apr. 1992.

[43] Robert E. Jordan, III, Special Asst. to the Sec. of the Army to Sen. Allen J. Ellender, 11 May 1970, Litigation Case file 410–01, "Steelheaders vs. Corps" WWD RHA. Harry Drake to WWD PAO, Dec. 1991, commenting on an earlier draft of this manuscript.

[44] Lawrence Smith, Attorney, Spokane, to Brock Evans, Sierra Club, Seattle, 7 May 1970, box 25, Brock Evans papers. *Spokane Spokesman–Review*, 17 Dec. 1971.

[45] *Spokane Spokesman–Review*, 19 Jan. 1977; Robert Sweeney, Asst. U.S. Attorney, to Robert Heins, Walla Walla District Council, 1 May 1980, "Fish and Wildlife" file, book 8, WWD EDF; "Lower Snake River Fish and Wildlife Enhancement Study," Information Paper, 14 Dec. 1989, WWD PAO.

[46] Testimony of Solomon at Corps of Engineers' hearing on Lower Snake River Compensation Plan 24 May 1973; Eugene Dziedzic, Asst. Chief, Environmental Management Division, Washington State Department of Game to Walla Walla District Engineer Col. Nelson Conover, 30 Apr. 1975. Both in Accession #79–7–480, Department of Fisheries papers, "Lower Snake River Compensation Plan" files, box 0061–76, Wash. Arch.

[47] The quotation is in *Lewiston Morning Tribune*, edit., 4 Feb. 1974. Also see the following issues of the *Tribune*: 28 Oct. 1970; 2 Feb. 1972; 21 Nov. 1974 (edit.); 30 Jan. 1976; 19 Mar. 1976. For additional background on the levees see Walla Walla District Engineer Col. Myron Page, Jr. to Division Engineer, "Reclassification of Lewiston–Clarkston Levees," 6 Aug. 1958, and "Draft Reply to Senator Warren Magnuson," Feb. 1963, both in RG 77, Accession #T77–85–0022, WWD files, box 20, Seattle FRC; Acting Walla Walla District Engineer Maj. Harold Matthias to Sen. Len Jordan, 9 Je. 1970, and Walla Walla District Engineer Col. Robert Giesen to Jordan, 3 Aug. 1970, box 218, Jordan papers. For visitation statistics, cost figures, and national trail designation, see "Lewiston Levees," Information Paper, 23 Apr. 1990, WWD PAO.

[48] Drake interview; Sivley interview.

[49] For details on the lower Snake River navigation gates, see Preston, *History of Walla Walla District, 1948–70*, pp. 159–60, 217–19, 242–3; and George C. Richardson, "Ice Harbor Navigation Lock," typescript, c. 1965, available at Army Corps of Engineers Walla Walla District library. The Sivley quotation came in Sivley interview.

[50] For railroad relocations, see Preston, *History of Walla Walla District, 1948–70*, pp. 215–62; and Preston, *Walla Walla District History, 1970–75*, pp. 107–09. Northwest Congressional representatives, feeling pressure from both railways and navigation proponents, favored railroad relocation. For some examples of the correspondence these Congressional representatives received on this issue, see series 3.3.3, box 52, Church papers. The issue of pro–navigation groups also desiring to maintain railroads took an interesting twist in 1990, when the Port of Whitman lead a strenuous fight to retain nearly 70 miles of rail lines in eastern Washington that the Union Pacific proposed to abandon. The Port even took its case to prohibit abandonment to a hearing of the Interstate Commerce Commission. It was an unusual turn in a long history of contention between open water advocates and railroads. They had battled one another during the time Congress debated authorization and funding for the lower Snake project, united in an effort to preserve rail lines along the river, then came at odds again as railroads sought to abandon unprofitable lines through eastern Washington's farm country––lines the railroads maintained became unprofitable only with the coming of slackwater. The Port of Whitman lost its case before the ICC. Newspapers throughout the Inland Northwest carried news of this story in April and May, 1990.

[51] For access roads, highway relocations, and bridge construction, see Preston, *History of Walla Walla District, 1948–70*, pp. 215–62; Preston, *Walla Walla District History, 1970–75,* pp. 107–09; and Jameson, Petersen, and Reed, *Walla Walla District History, 1975–80*, p. 277

[52] The quotation is in a form letter from Connell to various dignitaries, 14 Dec. 1972, "Lower Granite––Washington Water Power Spillway Removal" file, WWD EDF. Additional information on the dam–removal project can be found in this file, as well as in Preston, *Walla Walla District History*, 1970–75, p. 110. Also helpful was the Sivley interview.

[53] The complicated and controversial story of developing adequate fish passage facilities at the lower Snake dams is recounted in Chapter 9 of this volume.

[54] See Preston, *Walla Walla District History, 1970–75*, pp. 89–90; and Jameson, Petersen, and Reed, *Walla Walla District History,1975–80*, pp. 273–92.

[55] Details for this construction history come from *Construction History Report: Lower Granite Lock and Dam Project* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1984); and from interviews with the authors by Walla Walla District employees Fred Miklancic and Joseph McMichael, both on 29 Apr. 1991.

[56] For details on the dedication ceremonies and the quotations, see: *Lewiston Morning Tribune*, 16 Je. 1975, 10 Aug. 1980; *Spokane Daily Chronicle*, 19 Je. 1975; *Spokane Spokesman–Review*, 22 Je. 1975; "Remarks by Senator Magnuson, Snake River Dedication," Accession #3181–5, box 254, Magnuson papers; and "Schedule of Lower Snake Dedication Events," RG 77, Accession #T77–85–0018, WWD files, box 16, Seattle FRC.

[57] The quotation is in the *Tri–City Herald*, 8 Oct. 1976.

Chapter 9
Fish

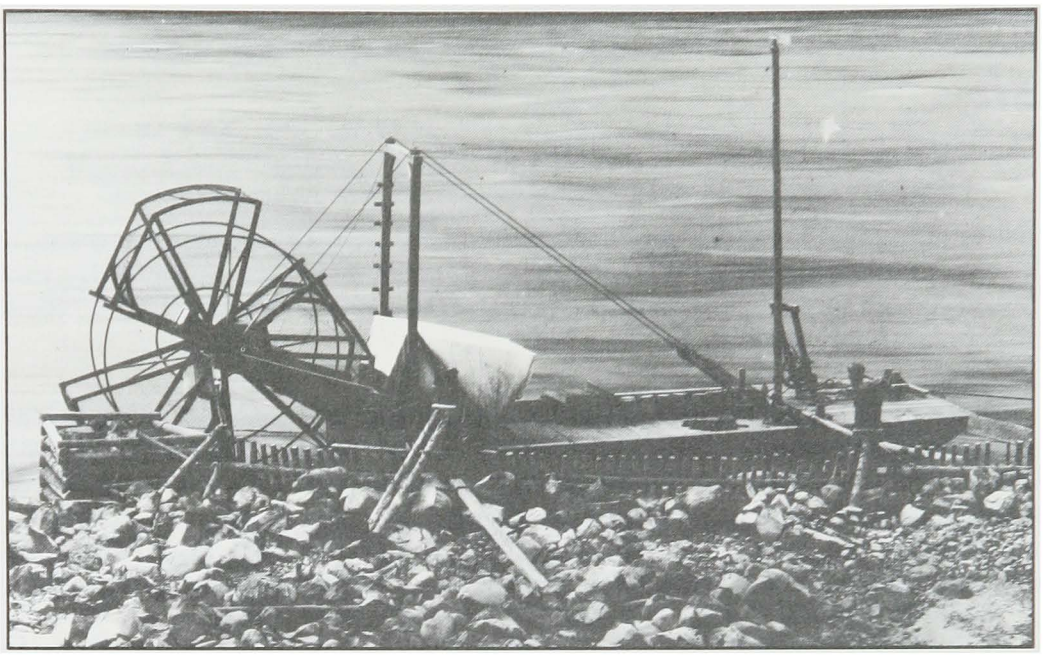
Not many people lived along the Columbia River in 1861, but a few fishermen caught salmon, selling it fresh locally or shipping it smoked, salted, or canned to distant markets. By 1866, commercial canneries processed more than 270,000 pounds, and by 1880, canned salmon ranked second in Pacific Northwest exports, behind only lumber. [1]

The quantities of Columbia River fish caught and processed increased steadily and dramatically during the next two decades. By 1884, canneries produced more than 42 million pounds. The catch dropped off drastically the next year, then fluctuated up and down in the 1890s and early 1900s. Increasing use of drift nets, beach seines, and fish wheels aided fishermen in boosting river catches, while dependable marine engines opened the ocean to trollers beginning in 1905. In 1911, commercial businesses processed nearly 50 million pounds. But there were already some people who understood that these tremendous yields could not last.

As early as 1894, the United States Commissioner of Fish and Fisheries stated that it "is beyond question that the number of salmon now reaching the head waters of streams in the Columbia River basin is insignificant in comparison with the number which some years ago annually visited and spawned in these waters." [2]

Attempts to preserve the fishing resources began in 1877, when Washington Territory imposed a salmon season on the Columbia. Oregon followed with similar regulations the next year. Both states passed laws regulating the type of gear fishers could use, eventually outlawing fish wheels, traps, and seines. Concern over the fate of salmon and steelhead also spawned a patchwork of conservation groups.

Early Columbia River fishermen seining for salmon near Wishram.



Fish wheel of the type historically used for the Columbia River fishing industry.

In 1885, the U.S. Commissioner of Fisheries, seeing that this hodgepodge of fishing regulations could never preserve fish runs, held out hope that artificial propagation offered a solution. Oregon developed its first fish hatcheries in the 1870s, and by the 1930s, several operated elsewhere in the Northwest. By 1937, a new Commissioner of Fisheries contended that hatcheries could not save the salmon and steelhead runs. Commercial fishing, impoundments on Columbia tributaries, irrigation diversions, poor logging methods, destructive farming and grazing practices, dredge mining, and a host of other factors had eliminated or severely degraded fish habitat. "How ill-founded was his faith in the all-effectiveness of [fish hatcheries] in maintaining or restoring the fisheries," wrote the 1937 Commissioner about his 1885 predecessor. [3]

The Commissioner's pessimistic report came out a year before the Corps completed Bonneville Dam with its fish passage facilities and about the time the Bureau of Reclamation completely blocked the upper Columbia River runs with the Grand Coulee Dam. The Columbia River fishery was a resource in trouble before the federal government began constructing dams in the Northwest. Still, fishery experts realized the situation would worsen once the Corps and the Bureau of Reclamation began building massive multipurpose projects on the main stems of the Columbia and Snake Rivers.

Dams, even those equipped with fish passage facilities, can deplete fish runs in many ways, not all of them apparent in the 1930s. Reservoirs can flood spawning beds. Smolts migrating downstream can be killed by rapid pressure changes or, if they survive, can emerge below a dam in a stunned condition, making them easy prey for seagulls, squawfish, and other predators. Fish flushed over spillways might succumb to increased levels of supersaturated nitrogen. If stressed too much in passing over a dam, fragile young chinook salmon are susceptible to bacterial kidney disease, a serious killer. Adults migrating upstream are sometimes unable to find fish ladder entrances, and even if they do, usually spend more time in the river than in pre-dam days, all the while subject to more stress, disease, and pollution.

Even those fish that survive face the threat of timing dysfunctions. Salmon and steelhead are precisely timed biological organisms. Delays in getting to the sea can cause smolts to die or lose their migratory urge and revert to a non-anadromous life cycle. If an adult salmon, which rarely eats once it enters the river, does not make it to spawning grounds on time it, too, can die, having depleted its store of fatty energy.

Recognizing that federal dams seriously affected fish and wildlife, Congress, on March 19, 1934, passed the Fish and Wildlife Coordination Act, which it amended in 1946 and 1958. These measures mandated that fish and wildlife be considered in the planning and construction of federal water development projects. [4]

Because of these and other federal laws, the Corps of Engineers became an active participant in compensating for fish losses resulting from its Snake River project. But the agency requested an even broader role. Beginning with Bonneville in the 1930s, for example, the Corps fought to maintain responsibility for fish passage facilities at its dams, even though other agencies could have legally handled that task. When Oregon Senator Charles McNary advocated splitting management at Bonneville between the Army Engineers and a proposed Columbia River Administrator, the Corps successfully argued against the plan precisely because of fish: "Neither this Department nor any other agency will be in a position to assure the preservation of the highly important salmon fishery on the Columbia River unless it has full and complete control of the operation of the dam" wrote the Chief of Engineers. In 1970, the Corps again defended its primary role in fish passage at its Columbia and Snake river dams. "We have the desire, manpower, and professional capability to effectively operate our fishway systems . . . without having the fishery agencies tell us what to do," wrote Pacific Division Engineer Brigadier General Roy Kelley. [5]

The Corps would be primarily responsible for passing fish around its lower Snake dams. But efforts to preserve fish would be one of the most expensive and controversial of its undertakings along the river.

The Corps broke much new ground in the Columbia/Snake River waterway. Nowhere else in the world had people gone to such lengths attempting to perpetuate anadromous fish runs while developing rivers. The Corps and other federal and state agencies invested millions of dollars in fishery research. Consequently, the "state-of-the-art" constantly changed.

At the time the Corps constructed Ice Harbor, most fishery biologists were primarily concerned about upstream migration of adult fish. It seemed logical that if fish ladders could guarantee a significant survival rate among adults, these would produce a sufficient number of smolts to insure fish runs, even if some juveniles died at each dam along the way. As a result, Ice Harbor originally had fish passage only for adults; smolts had to fend for themselves.

The Corps built two fish ladders for adults at Ice Harbor, one on each side of the river. They also built two at Lower Monumental. But the Corps was always innovating. By the time it reached Little Goose it had discovered it could save a lot of money, yet pass fish just as effectively by installing only one ladder per dam. Fish are attracted into an entryway on the dam's non-laddered side, then swim through a lighted tunnel to the other side of the dam to pass up the ladder. And the ladders along the lower Snake had improved a lot since the Bonneville days. Fish now had a wide variety of options: they could jump over the top of baffles, go through holes in them, or pass at any depth through a slit running all the way up the ladder. "The ladders work," stated Steve Pettit, Idaho's fish passage specialist with the State Department of Fish and Game in 1990. "The Corps knows how to build them well." As Joseph McMichael, the Walla Walla District's Lower Snake River Fish and Wildlife Compensation Plan project manager noted, "Our upstream migration is good. The fish come up in good shape. They're not battered. You don't hear much criticism about upstream migration." But as studies began revealing the number of smolts that actually died at each dam, as well as the devastating cumulative effects of dams, the Corps realized it needed to improve fish passage and survival rates of juveniles. [6]

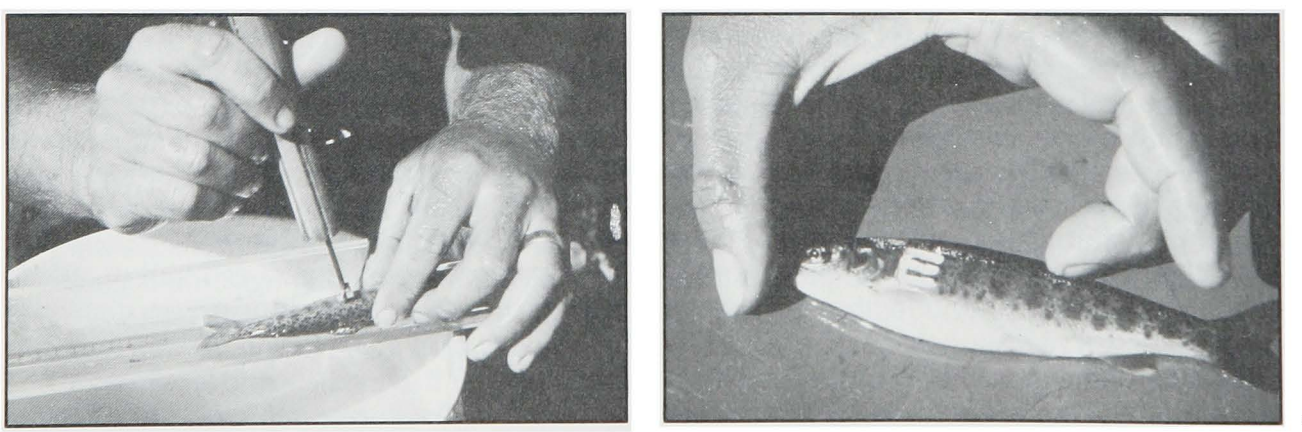
"The fishery agencies' knowledge was good enough at the time we began building dams," recalled former Walla Walla District biologist Ray Oligher. "But with the dams came a host of problems none of us had anticipated"--especially for juveniles. [7]

McNary Dam actually started the concern over downstream migration. Fishery agencies began a series of tests, marking smolts, placing them in the river above the dam, then netting them below to determine mortality going through the structure. The tests were a bit primitive at first. "A couple of studies showed that more got killed than had been planted above the dam!" laughed Oligher. "Those things are bound to happen. But the tests did show there were deaths. That was when we got concerned."

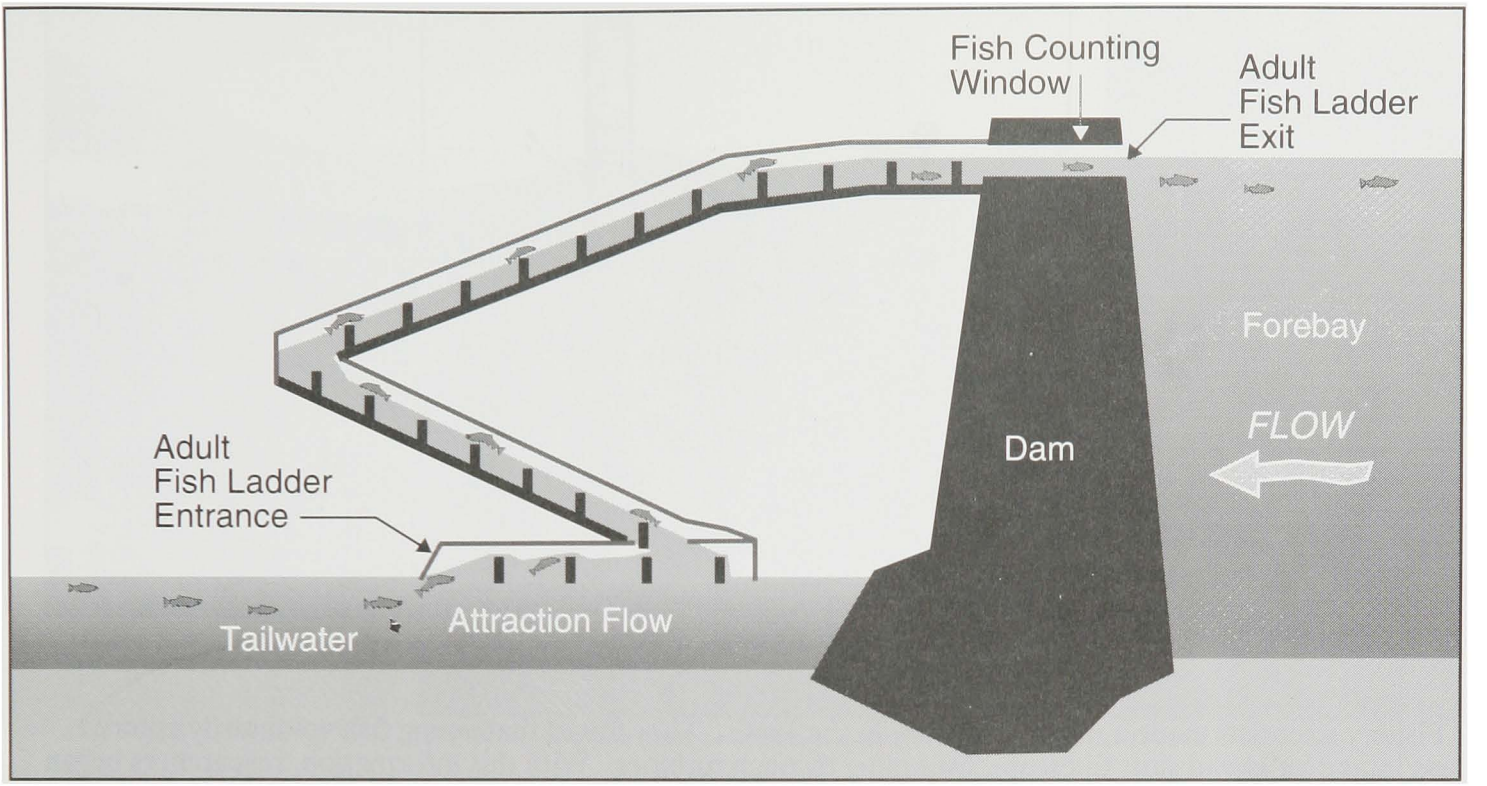
McNary's turbines killed some of the smolts, leading the Corps to extensively study turbine design, developing safer turbines for the lower Snake dams. The studies also demonstrated a dramatic increase in predation. The rivers always hosted smolt predators--birds and fish that feasted on the juveniles. But slow-moving reservoirs attracted even more, particularly squawfish. The smolts tended to pool up behind dams before moving through, attracting predators. "I've stood and looked down over a dam and all you could see were walls of squawfish," noted Oligher. "For juveniles it was like swimming into the jaws of hell." So the Corps began experimenting on the lower Snake with ways to more safely pass smolts. At first, some of the solutions seemed a little rudimentary. But the Walla Walla District was on the cutting edge of juvenile bypass experimentation. It would prove to be difficult attempting to solve the complicated problem of passing young fish through reservoirs and over a series of dams. The Corps began its experiments at the first lower Snake project it completed.

The engineers had designed a sluiceway to divert ice and trash around Ice Harbor Dam. In the 1960s, the agency drilled holes into turbine intakes from the sluiceway to provide access for juvenile fish. But the juveniles had to find their way voluntarily to the sluiceway openings since there were no fish guidance devices. Further, those fish that did make it into the sluiceway hurtled past the dam at such high velocity that some were stunned and fell prey to predators downstream. Even so, the sluiceway proved safer than going through turbines or over the spillway. But only a few migrating smolts used it. [8]

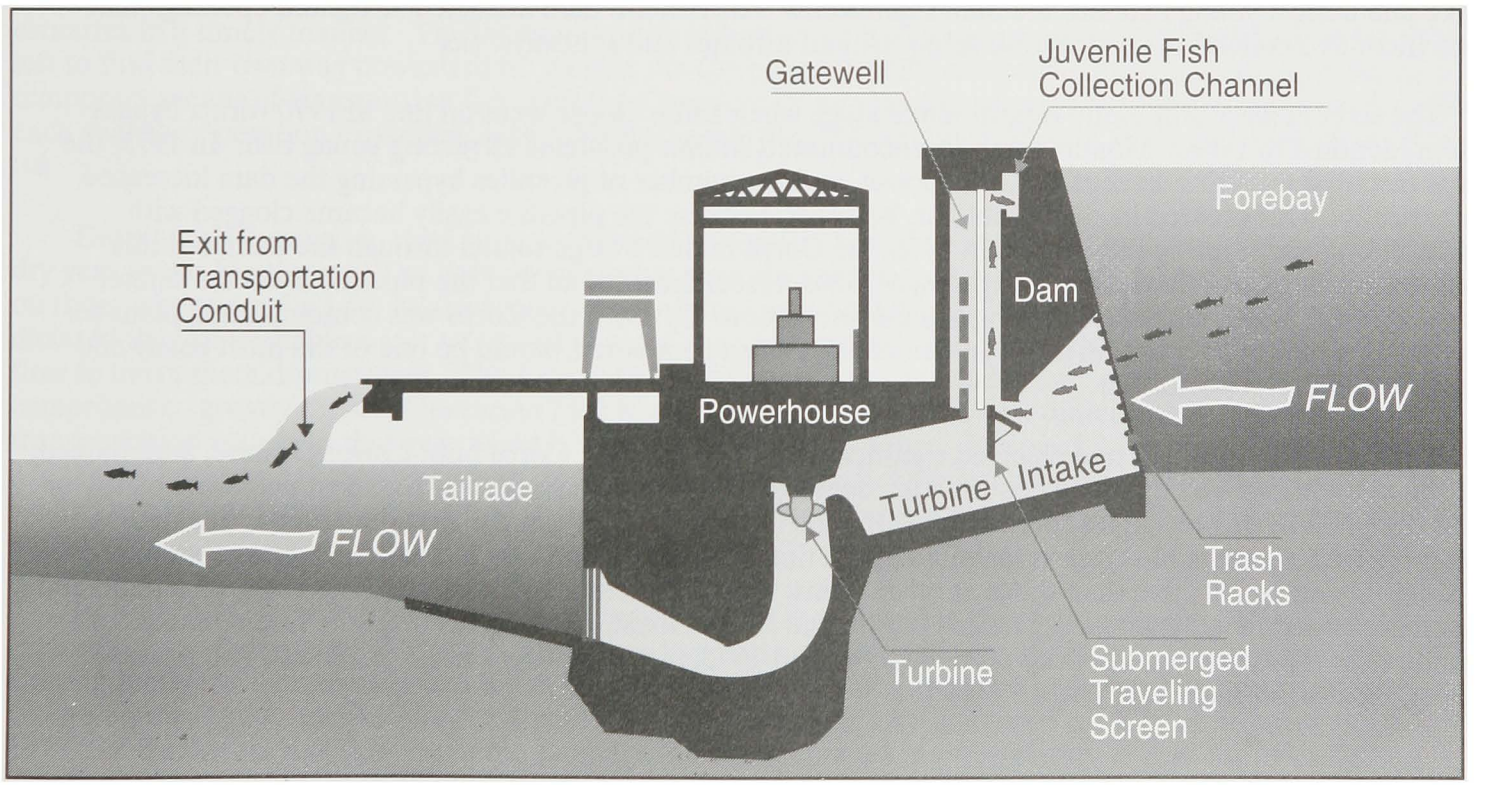
The Corps did not build an ice/trash sluiceway at Lower Monumental Dam, but the Engineers embedded a juvenile collection pipeline along the entire length of the dam. This system, however, proved less effective than the converted sluiceway at Ice Harbor. [9]



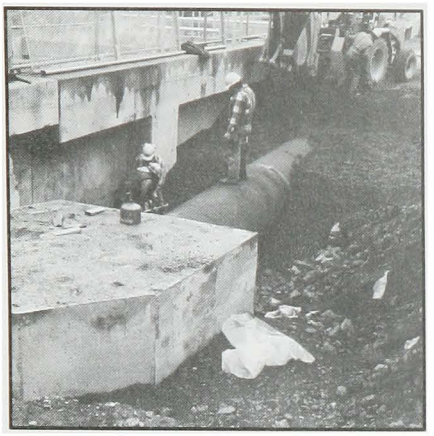
Marking smolt.



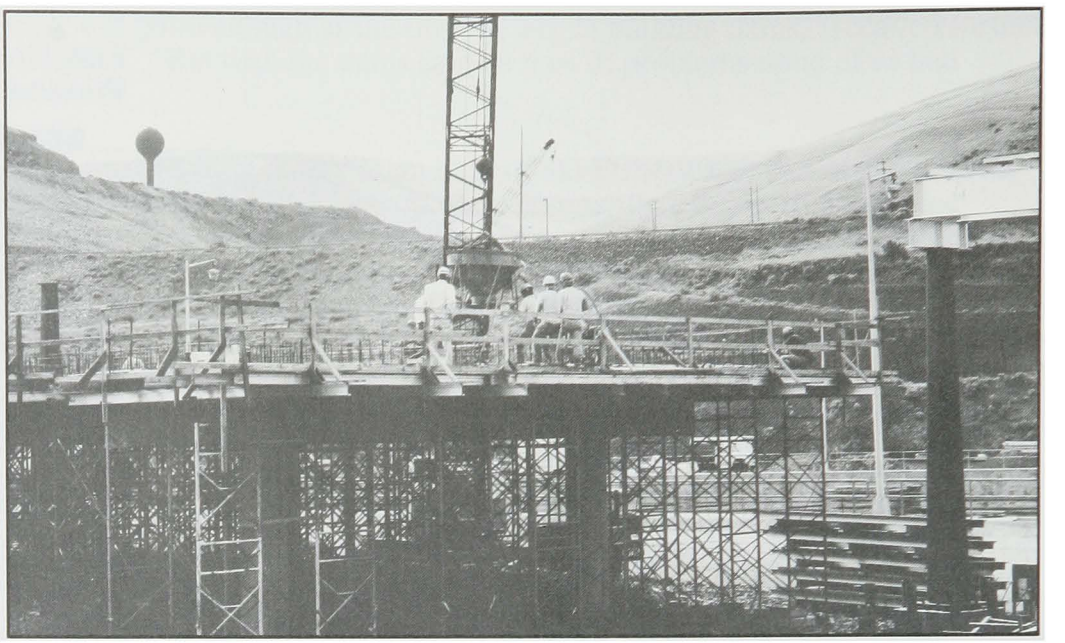
Cross–section of typical Columbia River project adult fish passage facilities.



Cross–section of typical Columbia River project juvenile fish bypass facility.



Backfilling around original fingerling bypass pipe, Little Goose Dam, 1979.

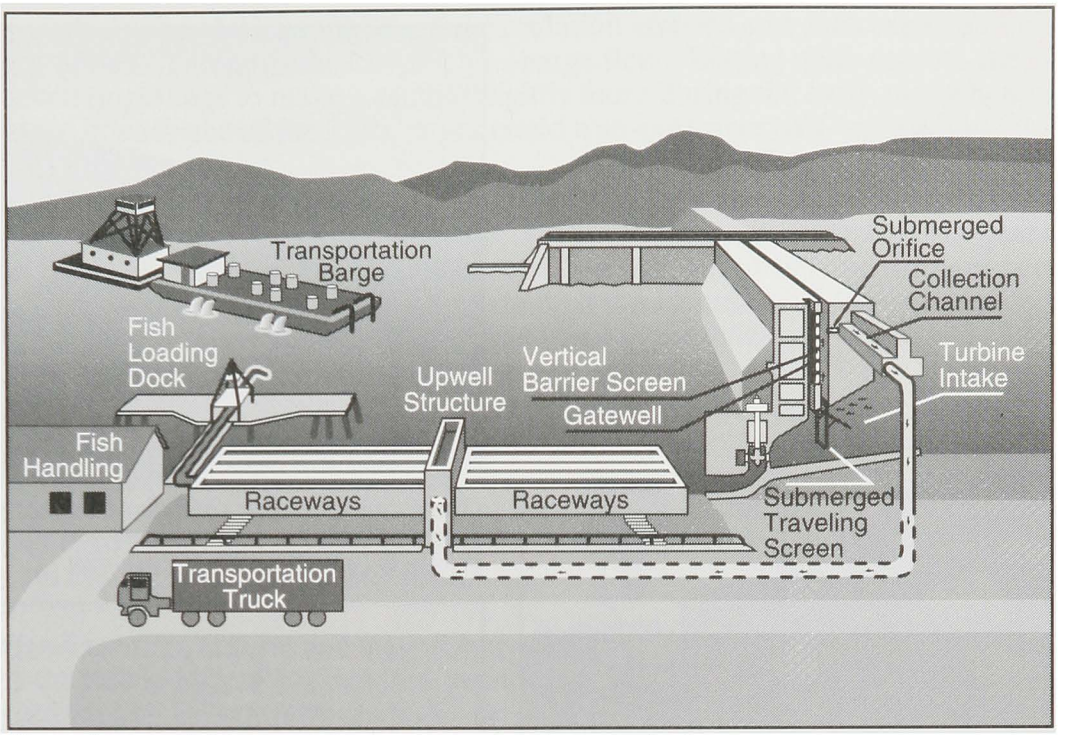


Constructing the new fingerling bypass fish facilities at Little Goose Dam, 1989.

Fishery scientists made a major discovery in the 1960s. They found that young fish voluntarily entered turbine intake bulkhead slots to escape swimming through turbines. With this information, researchers began to develop a way to deflect fish from the bulkhead into bypass systems. In 1969, they came upon the idea of submersible traveling screens. The screens, enormous moving belts of mesh, sit at an angle at the turbine intake and deflect young fish into the dam's gatewells. The fish are then attracted to lighted openings that guide them to a collection channel and safely around turbines and spillways. [10]

The screens were still in the experimental stage when Little Goose went on line in 1970 with a bypass system identical to Lower Monumental. It encountered similar problems attracting young fish. In 1973, the Corps installed traveling screens at Little Goose, and the number of juveniles bypassing the dam increased dramatically. This created its own problems, however, because the pipeline easily became clogged with debris, killing and injuring fish. Then, in 1978, the Corps mined a large tunnel through the dam, but this larger passageway had flaws, too. By the early 1980s, researchers found that the pipeline from the tunnel pressurized the water and caused nitrogen supersaturation. By 1983, the Corps was contemplating plans for developing a new bypass system at Little Goose that, when completed, would be one of the most costly and sophisticated in the world. [11]

The state–of–the–art had changed significantly by the time the Corps built Lower Granite, and, indeed, continued to change during construction. This dam's juvenile bypass system was the most elaborate of any of those designed during original construction along the lower Snake. It was the first dam on the Snake or Columbia with submersible screens installed at the time of construction. As a result, its bypass system proved considerably more effective than those at other dams, safely attracting an estimated 50 percent of salmon and 75 percent of steelhead juveniles. Lower Granite and Little Goose also had holding and loading areas for juvenile fish. These became heavily used, beginning in 1977, in the District's most publicized fish passage project, Operation Fish Run. [12]

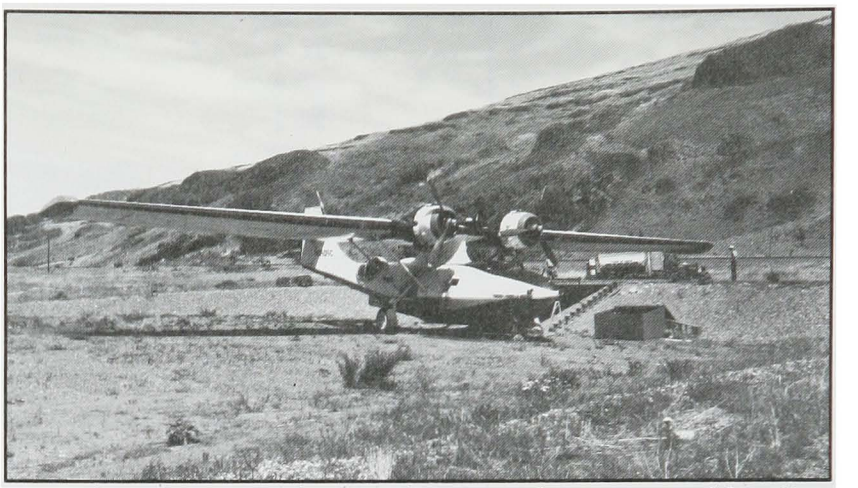


Sketch depicting fish bypass and capture system at a lower Snake dam.

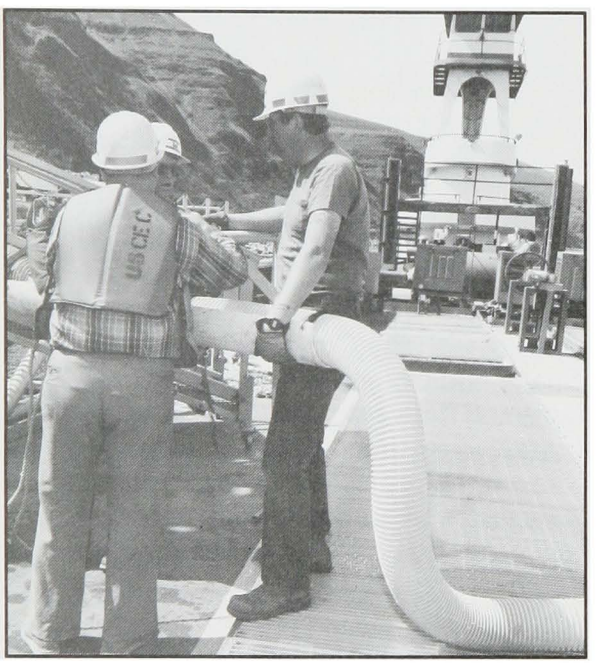
In 1968, the National Marine Fisheries Service (NMFS), under contract with the Corps, began an experiment of transporting juvenile fish by truck around dams on the Snake and Columbia, releasing them below Bonneville. The unorthodox method lessened fish kills at the dams and delivered the tiny fish to estuaries in a timely manner. Preliminary reports indicated a survival rate twenty times higher than for fish left to find their own way downstream. At first the Corps and NMFS viewed the project as an experiment, a temporary means of transporting fish until the Corps could construct hatcheries to produce more smolts. But each year the operation expanded, with NMFS transporting 154,000 fingerlings in 1971, and 435,000 in 1976. [13]

Despite this expansion, the Corps considered Operation Fish Run an experiment until 1977, an extremely dry year in the Northwest. The light snowfall that year, and predicted low run–off, forced difficult decisions on those who controlled the multipurpose dams of the lower Snake and Columbia. Power requirements dictated that all available water be stored to meet energy demands. But young fish required a steady water flow to hurry them downstream. The Corps met with fishery agencies and power marketers to reach a compromise: greatly expand Operation Fish Run. The District added a new dimension to the fish transportation system in that year when it began hauling fish by barge. It moved 2.2 million smolts downriver, 378,000 by barge and the rest by truck. In 1981, the transportation project became a permanent part of Walla Walla District operations. By the end of the 1980s, the Corps was transporting more than twenty million fish annually.

In 1968, NMFS netted juvenile fish at Ice Harbor prior to trucking them downstream. That method injured smolts and proved too time–consuming, especially in view of plans to transport millions of fish. Consequently the Corps constructed fish holding areas and loading facilities at Lower Granite and Little Goose on the Snake, and McNary on the Columbia. The Corps also increased the size of its barge fleet. In 1977, the Engineers had only six weeks to adapt two rented barges into temporary homes for juvenile fish. The Corps replaced these in 1978 with two Army surplus barges modified to carry 26,000 pounds of fish each. Later they added two new 50,000–pound barges to the fleet, and in 1989 constructed two barges at a

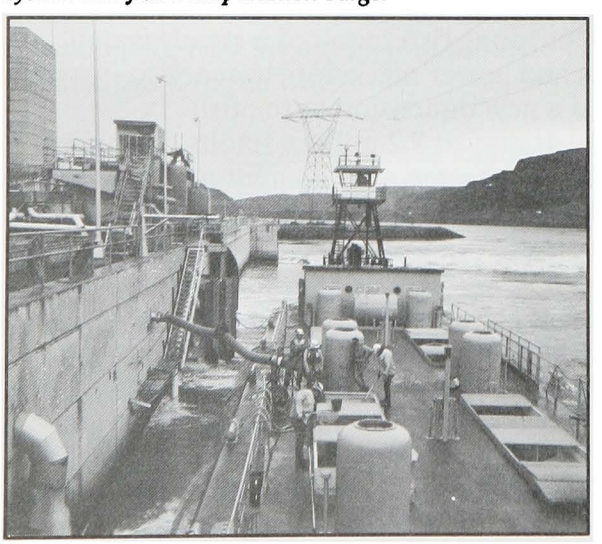


During the early years of Operation Fish Run, sea planes transported fingerlings downstream. The seaplanes worked well, getting the fingerlings downriver quickly, but proved too costly to continue.

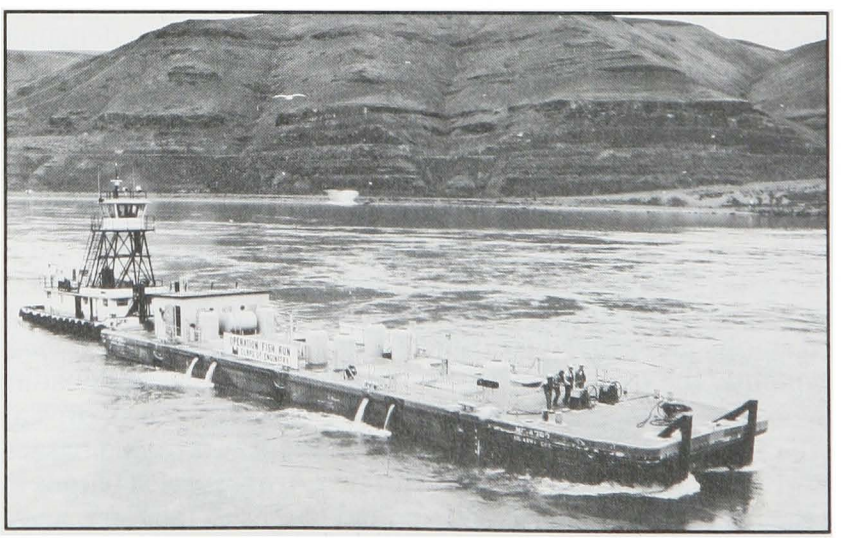


Plastic pipe transports juvenile fish from dam bypass system into fish transportation barge.

Operation Fish Run transportation tanker, 1971.



Fish transportation barge, 1984.



Fish transportation barge, 1984.

cost of nearly $3 million dollars, each equipped with sophisticated circulation systems and each capable of carrying more than 75,000 pounds of fish. This gave the Corps a six-barge fleet. During mid-season, the Corps estimates it takes about seven fingerlings to make a pound, slightly more during the early runs when fish are smaller. But at seven to the pound, one of the 1989 barges could transport over half-a-million fingerlings.

State fish agencies, Indian tribes, and the Corps praised Operation Fish Run, especially in its early years and in low-flow seasons. Had it not been for the transportation system, the drought of 1977 would have been disastrous for steelhead and salmon smolts. Operation Fish Run, renamed the Juvenile Fish Transportation Program in 1981, proved its effectiveness in numerous other low-flow years in the 1980s.

Gradually, however, some fishery officials came to question over-reliance on transportation. Young steelhead did remarkably well, and the juvenile transportation program led to greatly increased numbers of survivors. But steelhead smolts are about twice the size of most chinook salmon juveniles and are considerably sturdier. Research indicated that salmon did not stand the stress of transportation as well. The Corps frequently modified its collection facilities in an effort to lessen stress on juveniles, but even so, the survival rate for young chinook did not approach that of steelhead.

Because of concern for chinook salmon, federal and state fishery agencies and Indian tribes, in the 1980s, requested that the Corps spread the risk in high or normal flow years, bypassing some juveniles back into the stream below dams rather than attempting to transport them all. By the late 1980s, the Juvenile Fish Transportation Program, one of the most successful of the Corps' resource preservation projects, had become somewhat controversial. The Army Engineers found themselves in the midst of another storm over how to preserve the important salmon runs of the Snake River. Despite millions of dollars and the dedicated efforts of federal, state, and local agencies, fish were still in trouble, and some critics blamed the Corps for relying too heavily on its prized fish transportation system.

After decades of concern about the impact of federal hydroelectric dams on fish runs in the Columbia River system, Congress in 1980 passed the Pacific Northwest Electric Power Planning and Conservation Act. Many considered it the most ambitious effort to-date to restore fish and wildlife resources. [14]

The Act gave BPA authority to protect, mitigate, and enhance fish resources affected by hydroelectric projects. At the same time it required the BPA to provide the Pacific Northwest with an "adequate, efficient, economical, and reliable power supply." Just how BPA should allocate water for these two sometimes-conflicting goals would be greatly debated in the 1980s.

The Planning and Conservation Act sought to restore Columbia River fish runs to their level prior to the construction of McNary Dam, the second federal project on the lower Columbia and Snake rivers. To do this, the Northwest Power Planning Council, charged with meeting the Act's requirements, proposed to double existing adult salmon and steelhead runs. They outlined several ways to meet that goal. BPA would divert water from power production to assist young fish in their downstream migration while the Corps installed bypass systems at all its lower Snake and Columbia dams and continued the Juvenile Fish Transportation Program.

The Act served as a mandate for the BPA but not for the Corps of Engineers. The Act guided the Corps and other federal agencies, but the Corps had to comply simultaneously with all the other laws governing its activities. Some of those regulations conflicted with the Act. For example, if people demanded hydroelectric

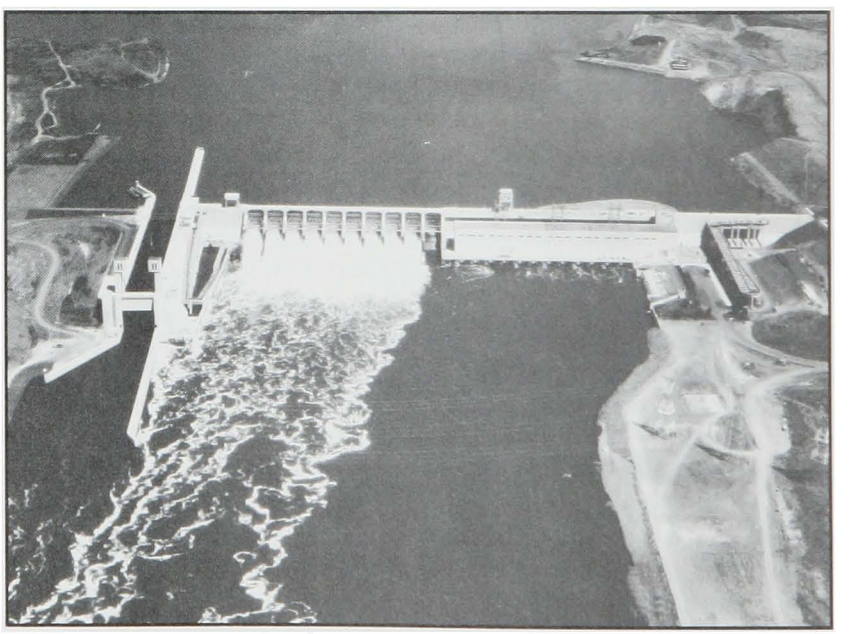
power, the Corps had to supply that demand to the extent its projects were able. This at times forced the Corps to choose between power demands and water flows recommended by the Act to assist migrating smolts.

In 1984, the Planning Council began the Water Budget program as a way of assisting fish runs. In critical flow years, the Council set the fish portion of the budget at 2.5 percent of the entire Columbia system flow; 1.8 percent in above–average flow years. From April to June each year, when the downstream migration reached its peak, that much water could be released from upriver storage dams to help flush smolts downstream, creating an artificial freshet. While some fishery officials believed the amount of water allocated to fish too small, BPA maintained that "this is more than a token gesture. . . . If the total Water Budget were reserved for power generation instead, it could be worth between $54 million and $74 million a year in BPA revenues." [15]

Often confused with the Water Budget, but actually a separate goal, was the policy of spilling water over dams not equipped with effective bypass systems, such as Lower Monumental and Ice Harbor. Through this policy, the Corps and BPA reserved a volume of water to help smolts over spillways. The Water Budget, on the other hand, sought to assist fish moving between dams. The Planning Council viewed spilling as temporary until the Corps equipped all its dams with modern bypass systems.

Some groups claimed that the Corps did not cooperate with the Water Budget and the spill policy. In one low-water year, for example, the flow of the Snake at Lower Granite fell below budget amounts for 22 days during the spring run. In 1987, Idaho Steelhead and Salmon Unlimited, a particularly vociferous critic of Corps' fish policies, claimed the agency "continually refuses to cooperate" in the Water Budget and spill goals, and was "in direct violation of the Northwest Power Planning Act."

The Corps, tribes, fishery agencies, and conservation groups did occasionally clash over the amount of water the Engineers could legally release for fish while still meeting its other multipurpose requirements. For example, in 1989, when the Planning Council announced a goal to quadruple the amount of water spilled over dams without bypass systems, Doug Arndt, a Corps' fishery biologist, replied that the plan would cost



Spilling water at Ice Harbor dam.

"several thousand dollars" for each juvenile fish that survived to adulthood. "It's going to be hard to justify that" to higher authority, he noted. Stated Walla Walla District biologist John McKern, "The Corps has cooperated in the provision of Water Budget flows since 1984. While the Corps may not always provide what the fishery agencies and tribes demand, the Corps has cooperated within the authorities governing [its] actions." Despite these differences, the Water Budget and spill policy proved only mildly controversial compared to the issue of providing bypass systems at all lower Snake dams. [16]

The Northwest Power Planning Council emphasized improving bypass systems. Increasing hatchery production alone would not sufficiently improve fish runs to meet Council goals if juveniles did not make it past the dams. Further, the Council believed bypasses necessary to protect runs of wild salmon and steelhead. Hatcheries performed an important function, but without the genetic diversity wild fish provided, entire species might be at risk by over-reliance on hatchery production.

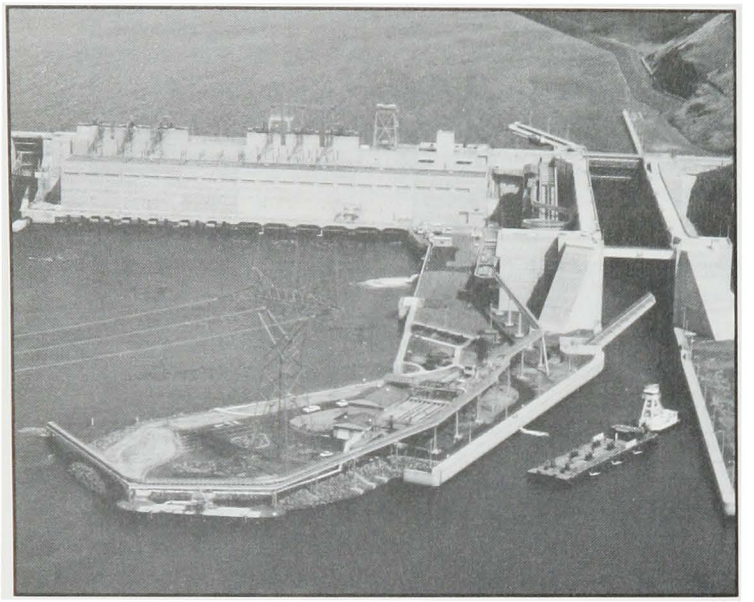
The Walla Walla District agreed with the need to modernize bypass systems at Lower Granite and Little Goose, and in 1983, it began meeting with fishery agencies and tribes to determine the best type of system. Rather than an improved pressurized pipe, all participants agreed to construct a fish flume at Little Goose. Although more expensive than pipeways, other agencies had used flumes effectively at a few dams in the Northwest.

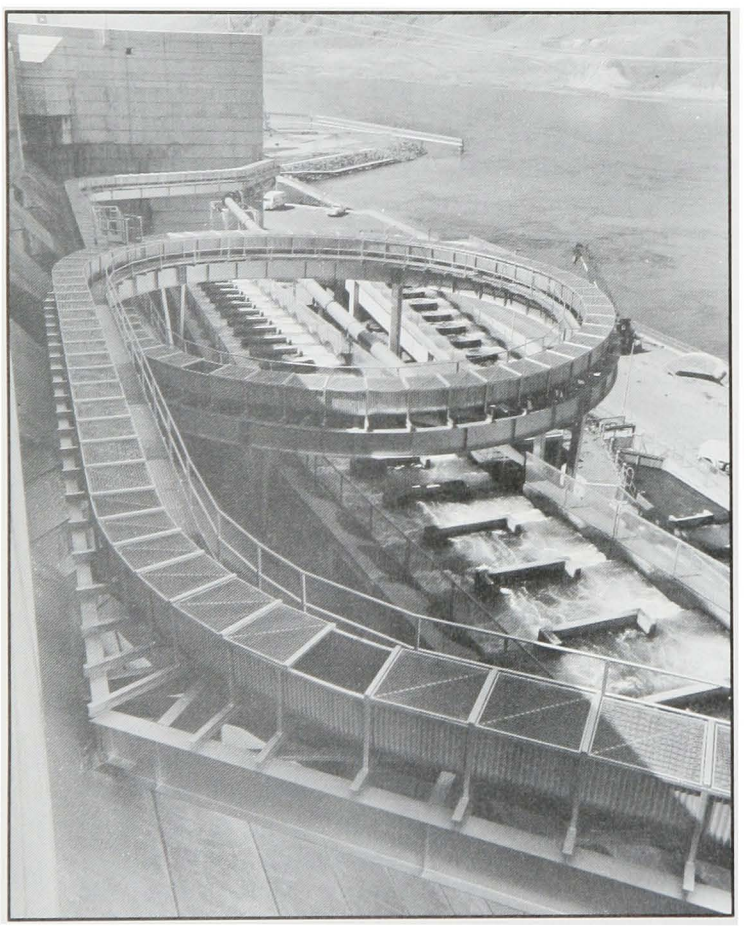
In 1985, the Corps began testing two types of flumes, one corrugated metal, and the other concrete baffles. There ensued a considerable debate over the relative merits of each, with fishery agencies at first maintaining the baffled flume provided the least stressful bypass. The Corps, on the other hand, worried about debris build-ups and the possibility that the slow-moving pools the baffles created might provide hiding places for predators. Unconvinced that these were serious problems, fishery agencies encouraged the Corps to test again, which the Engineers did in 1987. The results proved the corrugated metal flume the least stressful for fish.

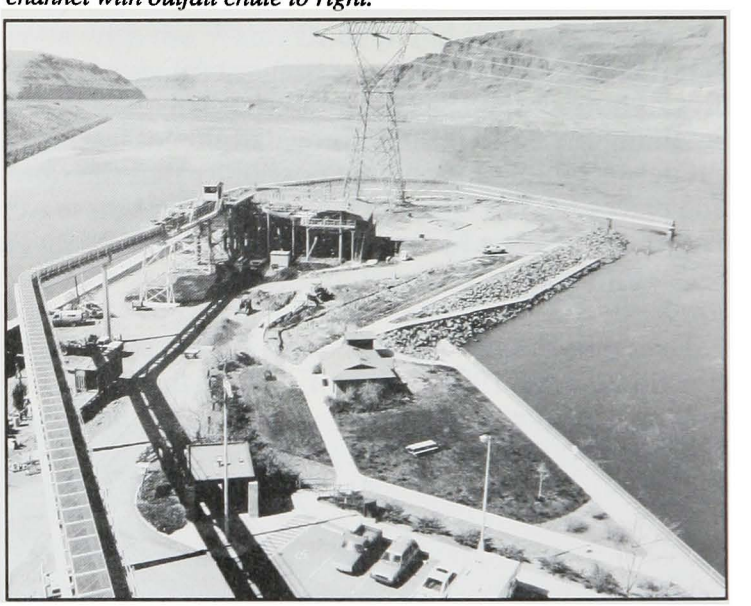
The additional testing brought delays. First planned for 1987, the Corps did not complete the Little Goose flume until 1990. When finished, the Corps of Engineers' first fish flume was the latest fish bypass technology. Huge structural steel towers, supported an outdoor corrugated steel flume nearly a quarter of a mile long, covered with vinyl sun screen. Now, rather than a dark rapid trip through pressurized pipe, young fish flowed at a speed of a moderate natural stream. [17]

The Northwest Power Planning Council also wanted the Corps to upgrade the system at Lower Granite and construct new bypass systems at Lower Monumental and Ice Harbor. The Corps agreed with the improvements for Granite and Monumental. But when the Engineers found an expensive bypass system at Ice Harbor economically unjustified, the decision touched off a confrontation over the best way to preserve fish runs. [18]

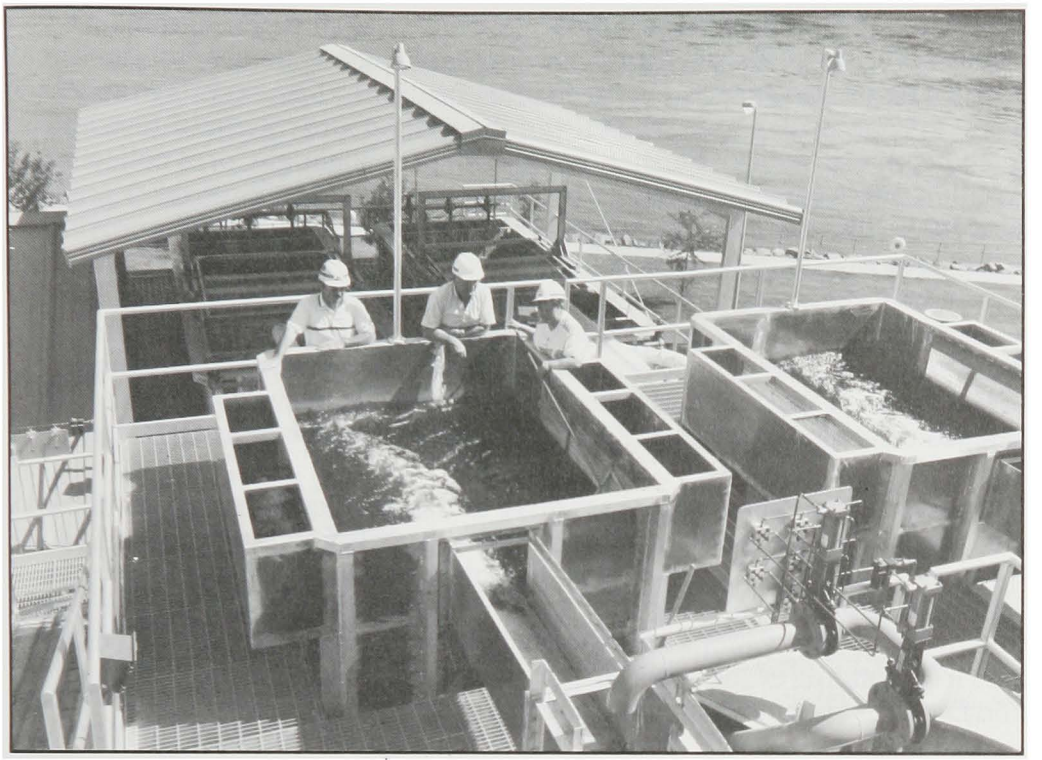
The Lyons Ferry Fish Hatchery, downstream from Little Goose, made a new bypass and collection facility at Lower Monumental economically feasible because the system could capture millions of smolts entering the river at that point. But there are no smolt-producing streams entering the Snake between Lower Monumental and Ice Harbor, and no hatcheries on the river. The Corps maintained it could not justify the expense of a bypass system at Ice Harbor to capture only the few fish it did not collect during the fish transportation operation at its three dams upstream. The Corps' conclusion that the bypass system at Ice Harbor was unjustified angered fishery agencies and some key Northwest politicians.







Juvenile fish bypass facilities at Little Goose, 1990; at left: looking east at entire length of bypass system; at lower left: bypass channel as it decends to the outfall chute; at lower right: west end of bypass channel with outfall chute to right.



Volunteer workers at the new Little Goose juvenile fish bypass facilities during the first season of operation, June 1990.

The issue came to a head in 1988. Northwest senators, particularly Idaho Senator James McClure and Oregon Senator Mark Hatfield, worked a 1987 proposal through Congress that would enable the Corps to spend $8 million on lower Snake bypass systems, including construction at Little Goose, modifications at Lower Granite, testing at Lower Monumental, and design work at Ice Harbor. The funding came in an omnibus appropriations bill with an accompanying report providing the Corps with specific instructions about how to disburse the money. But the Office of Management and Budget (OMB) and the Corps balked, refusing to spend the funds as indicated. They claimed that such congressional reports were not binding. The Corps and OMB, technically correct, nonetheless irritated Northwest congressmen who believed Congress's intentions were clear. Despite congressional protests, the Corps did not reconsider. Major General H.J. Hatch, the Corps' Director of Civil Works, chose to expend only $4 million, and then not on the projects outlined by Congress. The Engineers would use $3 million to purchase two new juvenile fish transportation barges and $1 million for additional studies to determine the cost–effectiveness of the bypass program.

It emerged as the opening volley in a complicated debate. The primary issue centered not on whether fish should be saved, but how best to save them. The Corps specifically questioned the wisdom of a multi–million dollar bypass system at Ice Harbor. According to Corps' figures, the system would return only 30 cents in benefits for each dollar expended. Fishery agencies challenged the Corps' mathematics.

Also at issue was what some perceived as the Corps' over–reliance on the Juvenile Fish Transportation Program. "We believe transportation is more efficient and productive than bypass screens," claimed Walla Walla District Engineer Colonel James Royce. Given enough barges, the Corps believed it could save more fish for less money than installing bypass systems and barge loading facilities at Ice Harbor and Columbia River dams below McNary. "Even with improved passage around dams, you'd still have reservoir mortality," noted Walla Walla District biologist John McKern. "Too many [smolts are] lost to reservoir predation." [19]

Fishery agencies, tribes, and conservation groups disagreed with the District's position. First, some questioned whether salmon fared as well on barges as when left to swim through bypass systems. But the issue proved even more complex. No dams below McNary had barge loading facilities. Fish entering the river beyond that point could be left "high and dry" according to Steve Pettit of the Idaho Department of Fish and Game, endangering entire runs not included in the barges. Further, not all fish get caught at Corps collecting dams, and those missed would be at risk if downstream dams had no bypass systems. "The Corps takes great pride in Operation Fish Run," observed Pettit. "It is a dynamic program. The Corps is constantly improving it. But it is not the only answer. We also need bypass systems." [20]

Yet another issue surfaced in the complicated debate over bypasses. Those advocating the system often found Corps officials in the Pacific Northwest sympathetic to their concerns, but had reservations about higher command at the Office of the Chief of Engineers in Washington, D.C. Norma Paulus, a member of the Northwest Power Planning Council, alleged that "the Washington, D.C. office has declared war on fish." [21]

Indeed, Army Engineers in the East frequently appeared less sensitive to fish problems than those in the Northwest. This was not a situation that surfaced only in the late 1980s. Biologist Ray Oligher, who worked for the Walla Walla District from 1954 to 1980, recalled that on several fish passage issues "we would become convinced of a course of action locally, but we couldn't convince the Corps' upper echelons. We were the ones who had to look those fishery people in the face. The Chief's office was 2,000 miles away." When the District began contemplating millions of dollars in expenditures for lower Snake juvenile bypasses, this occasional split between the District/North Pacific Division and the Chief's office became acute once again. [22]

Director of Civil Works, Major General Hatch wrote to the North Pacific Division in 1987 that we are "not convinced that the fish survivability goals you are attempting to achieve are justified, appropriate or something the Corps must accomplish." Lieutenant Colonel Kit Valentine of the Chief's Office of Environmental Overview, after touring fish facilities along the lower Snake that same year, declared that Corps officials in Washington had questions about "when enough is enough." He reminded Walla Walla District personnel that the Corps' primary concerns remained flood control and navigation, and that the "environmental–natural resources program with the U.S. Army Corps of Engineers has a limited visibility and a [lower] priority." He expressed concern with the many arrangements to preserve fish runs made between the North Pacific Division and various fish and wildlife agencies. [23]

Despite the many accusations and allegations on both sides and legitimate differences of opinion on how best to preserve fish, the Corps' refusal to spend money in the way Congress requested invited serious criticism. "It gets disturbing when Congress takes action on something like this and you say that you're not going to honor it," Idaho's Senator McClure complained to the Corps. "We consider your response to be completely unacceptable in its policy intent," he and Senator Hatfield wrote to the Office of Management and Budget. "I'm outraged," stated Idaho Representative Richard Stallings. "It's very clear what Congress intended." It was heavy artillery, and it had an effect. [24]

While most critics blamed the Corps, the issue was bigger than a disagreement between the Engineers and Congress. It was actually a fight between Congress and President Ronald Reagan's White House. "What we have here is probably not the Corps of Engineers as the villains," claimed Oregon Congressman Les AuCoin, "but the Office of Management and Budget, which is trying to squeeze funds, . . . putting pressure on the Corps to not release these funds." Northwest Power Planning Council lobbyist Stephen Crow agreed: "It's widely known that under the Reagan administration, projects for fish and recreation take a backseat to more traditional activities of the Corps, like flood control and navigation." [25]

The Reagan policy was akin to President Eisenhower's plan to withhold money for federal hydroelectric dams until local or state agencies agreed to match federal funds. The Reagan administration believed the federal government had over–invested in various programs to save Northwest fish and wanted to scale back expenditures, hoping state governments would fill the void.

But Congress ultimately prevailed in this particular battle. When legislators went back into session they specified exactly how the Corps should spend its money. And the Walla Walla District began expending it along the lower Snake, including appropriating design funds for a new Ice Harbor bypass system. The Corps still did not believe the system economically justified. The Walla Walla District noted in a 1990 information paper that with new collection and bypass systems at the three dams above Ice Harbor, "construction of fish facilities at Ice Harbor is questionable. However, the Senate Committee on Appropriations included [funds] . . . to complete plans and specifications and to start construction of screens and transport channels." So that is what the Corps would do. Sometimes politics proved more decisive than economics. [26]

The Corps of Engineers spent more than $50 million on fish passage facilities at its four lower Snake dams during original project construction, and planned to expend $142 million more installing advanced bypass systems at lower Snake and Columbia dams. In addition, there were annual operating expenses to manage the Juvenile Fish Transportation Program, staff fish laboratories, pay for fish counters, conduct research, and do a variety of other related tasks. [27]

All of these expenses comprised the cost of doing business along the Columbia/Snake waterway. In its 1945 project authorization, Congress required the Corps to find ways to pass anadromous fish. Not part of that original authorization, however, was fish and wildlife mitigation, a concept not required at federal water projects until 1958 when Congress amended the Fish and Wildlife Coordination Act. As a result of this law, the Corps will spend more than $220 million in additional funds, plus an estimated $10 million in annual operating expenses, to compensate for fish and wildlife losses brought by its lower Snake projects. It is one of the biggest mitigation programs in United States history. [28]

In 1959, the Walla Walla District requested the U.S. Fish and Wildlife Service to submit reports outlining the effects of the four lower Snake dams and recommending compensation measures. Fish and Wildlife Service completed individual reports on the first three dams, but by 1966 the Corps concluded that the expense of providing compensation on a project–by–project basis was too high. As a result, the Corps asked the agency to furnish a report on the four dams as a unit.

In 1971, the agency finished a draft assessment. The Walla Walla District provided comments, and Fish and Wildlife Service submitted a final compensation plan in 1972. Incorporating the agency's demands, the Corps in 1973 developed a draft compensation plan. The Corps then held a series of public meetings concerning the plan and subsequently revised it in 1975. In 1976, Idaho Senator Frank Church introduced legislation enabling the District to compensate for losses. Just minutes before Congress adjourned on October 1, it passed the Water Resources Development Act, which included the Lower Snake River Compensation Plan. On October 22, President Gerald Ford signed the Act into law.

The bill provided for the acquisition of 24,150 acres for wildlife habitat and fishing and hunting access land, as well as the construction of nine fish hatchery complexes. The first money became available in 1978, when Congress released $1.5 million for hatchery design studies. [29]

While this summary shows that nearly two decades passed between the time mitigation studies began and actual compensation money became available, it does not indicate the difficulty involved in developing the final proposal. The real history was more complicated.

"We were changing things," remembered Willard Sivley of those days of massive construction along the lower Snake. "Whenever you change things, you upset people. We tried to balance the demands of many groups. We learned a great deal in the process. It surprised me how little we and the fishery agencies knew about fish. That we preserved fish runs at all is something of an environmental miracle." [30]

Sivley graduated in engineering from the University of Wisconsin and got his first job at the Walla Walla District in 1950. He worked up through the ranks, eventually serving as Chief of the Engineering Division from 1973 until his retirement in 1980. Recognizing the importance of fish and wildlife along the lower Snake and the Corps' increasing responsibilities in this area, the agency in 1963 sent Sivley to the University of Michigan for a Master's degree in natural resources. As Chief of the Planning Branch he would become one of the primary formulators of the Corps compensation plan for the lower Snake. Joining him in making those plans were Bert McLean and Ray Oligher, two of the Corps' pioneering biologists, who had also come to the District in the 1950s. It was unusual for Corps districts to have staff biologists in those days, and certainly rare for a district to sent an engineer back to school for a degree in natural resources. "I think Walla Walla District was pretty progressive in terms of the environment," Sivley recollected. "Some other people don't agree."

The Corps of Engineers entered a period of transition in the late 1960s, moving from an agency primarily concerned with construction to one that would assume greater responsibility for preserving natural resources. The Corps hired its first biologist in 1938, but by the mid–1960s, it had fewer than 75 natural resource personnel in the entire agency nationwide. Then the situation began to rapidly change. In 1966, the agency established a recreation and environmental branch under the Chief of Engineers, and by 1970 the Corps employed more than 200 biologists. Shortly after the National Environmental Policy Act became law in 1969, the Corps created a six–member Environmental Advisory Board. The Corps' local districts, such as Walla Walla, also changed to include environmental resources sections. By 1972, the Army Engineers nationally had 400 people working in its environmental operations, a number that grew to nearly 500 a few years later. "There's just no way to see in the 1974 Corps of Engineers the same structure that was there in 1969," stated Major General John Morris, the Corps' Deputy Director of Civil Works, in an interview that year. Even the Sierra Club, a frequent Corps adversary, praised the Engineers, stating in 1973 that "The Corps has . . . probably done the best job of any federal development agency in implementing the National Environmental Policy Act." [31]

But in 1970, the Corps remained primarily a development agency. The North Pacific Division, frustrated at the delay in the compensation report the fishery agencies were to produce, began blaming the Fish and Wildlife Service for the long–overdue plan. Responding to criticisms of a brochure the Walla Walla District published in 1970 downplaying the negative effects of the Snake River dams, Division Engineer Kelley wrote to the Bureau of Commercial Fisheries, "had we had the benefit of the required Fish and Wildlife Service report on the Lower Snake projects, which we requested in 1966, our brochure might have been improved." [32]

Fishery people had a different perspective, accusing the Corps of causing delays because it refused to provide needed information. Indeed, as the Washington Attorney General's office informed the Corps, it was precisely because of this perceived inaction that the Washington Department of Game entered into the Northwest Steelheaders' Lower Granite lawsuit against the Corps. [33]

Despite the various charges and counter–charges, the Fish and Wildlife Service did complete its draft compensation plan and submitted it to the Corps. The Corps had some concern about the report, specifically its recommendation for constructing several multi–million dollar fish hatcheries. "While propagation has a role in the total mitigation plan, we disagree that it need be the major element," wrote Division Engineer Brigadier General K.T. Sawyer. But the hatcheries would be built, becoming the most expensive part of the plan. [34]

Although fishery agencies at times criticized the Corps for moving slowly, no one understood just how seriously the lower Snake dams affected fish runs until the 1970s. When John Day, Lower Monumental, and Little Goose came on line in rapid succession, studies proved what fishery agencies had only been able to speculate about up to that time: fish could negotiate a dam or two, but a river filled with obstructions took a dramatic toll. In 1962, the first year of fish counting at Ice Harbor, a total of 213,000 steelhead and salmon climbed over the dam. By 1970, the number dropped to 136,000, and by 1974, plummeted to 46,000. As such declines became apparent, the Corps willingly cooperated with fishery agencies in attempting to persuade Congress to pass the Compensation Plan. Indeed, the size of the Corps' proposal surprised many people, both within and outside the agency. "When we first started talking about a $58 million mitigation program in the early 1970s, we staggered a lot of people," was the way Sivley characterized it. [35]

"The Corps of Engineers gets its innovation from the field, and it filters up to Washington, D.C." At least that was the way Sivley saw things. Consequently, he was not surprised when Corps officials from Washington occasionally came to the District and "accused us of caving into local people and spending too much on fish."

But Sivley, Oligher, and others at the District, who worked closely with the fishery agencies, recognized that the Engineers had to offer a bold compensation plan––or face regional wrath for not doing enough to save fish. The Corps submitted its proposal for a massive fish and wildlife compensation plan for the lower Snake in 1973. Oligher was part of the District's party that journeyed to Washington, D.C. to attempt to convince the Chief's office to accept the expensive proposal. It took two days of negotiation––"it was a tough sell," according to Oligher––but the District succeeded. The Chief of Engineers approved the plan. But some other people proved less than enthusiastic. [36]

The most expensive item in the plan, construction and operation of fish hatcheries, concerned a number of agencies. Virtually all costs incurred by the fish hatcheries would have to be returned to the federal government from the sale of electricity generated at the four dams. That meant passing on the costs of hatchery construction to electricity users in the form of higher rates.

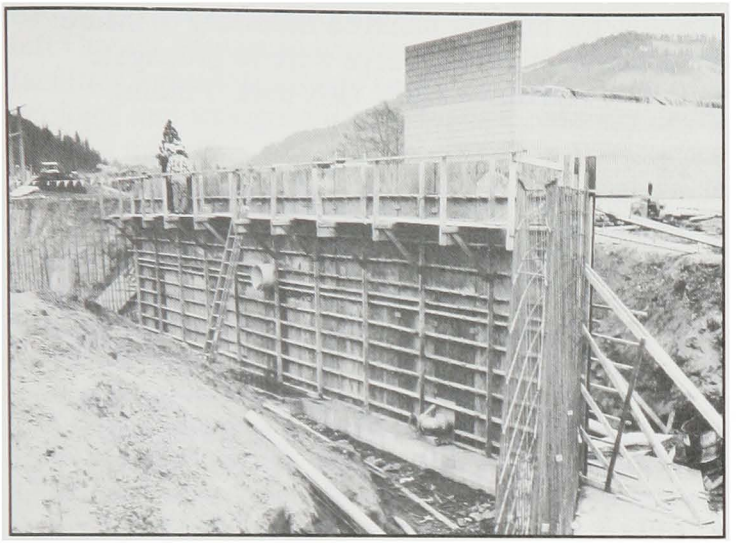
Yearly Totals of Salmonids Counted over Ice Harbor Dam – 1962 to 1992

Year	Chinook*	Steelhead	Sockeye	Coho*	TOTALS
1962	94,301	115,796	38	3,207	213,342
1963	61,190	74,539	1,118	1,933	138,780
1964	60,097	58,860	1,276	2,071	122,304
1965	39,233	62,873	317	320	102,743
1966	75,882	65,798	278	878	142,836
1967	84,930	44,205	717	3,770	133,622
1968	98,681	82,383	1,165	6,227	188,456
1969	100,514	63,889	745	5,316	170,464
1970	77,698	53,870	797	3,636	136,001
1971	70,248	67,029	532	2,969	140,778
1972	82,632	63,593	363	2,522	149,110
1973	81,821	38,311	233	2,443	122,808
1974	32,444	12,528	204	1,334	46,510
1975	31,686	16,218	243	1,559	49,706
1976	36,556	23,885	771	1,991	63,203
1977	56,514	54,820	582	1,561	113,477
1978	61,352	27,142	86	652	89,232
1979	13,929	23,117	30	398	37,474
1980	14,717	50,221	36	58	65,032
1981	22,092	41,290	142	82	63,606
1982	22,646	73,405	174	348	96,573
1983	20,259	88,475	216	465	109,415
1984	17,757	94,030	105	22	111,914
1985	47,981	128,481	24	10	176,496
1986	52,615	144,292	20	–	196,927
1987	47,477	74,491	13	–	121,981
1988	48,066	99,714	22	–	147,802
1989	27,234	151,101	4	–	178,339
1990	31,841	54,758	1	1	86,601
1991	23,175	123,762	9	1	146,947
1992	36,021	160,614	33	–	196,668
Totals	**1,571,589**	**2,233,490**	**10,294**	**43,774**	**3,859,147**
Ten–Year Average	35,243	111,972	45	50	147,309

Yearly Totals of Salmonids Counted over Lower Granite Dam – 1975 to 1992

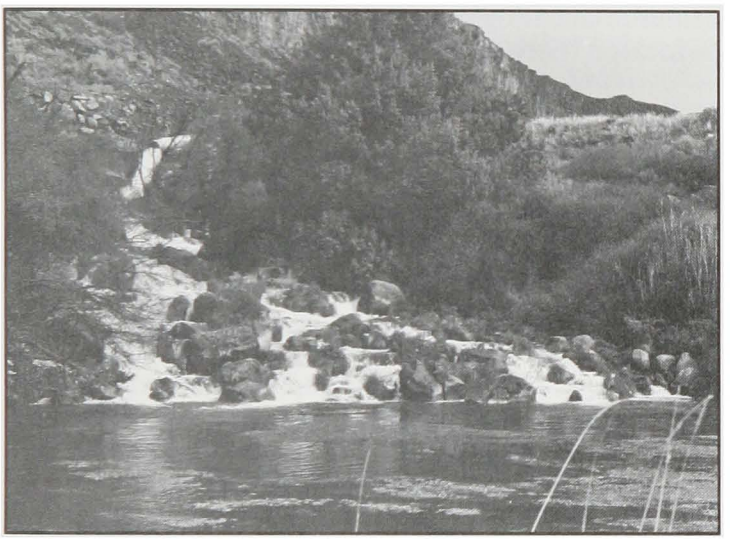
Year	Chinook*	Steelhead	Sockeye	Coho*	TOTALS
1975	28,460	17,311	209	921	46,901
1976	31,667	23,017	531	900	56,115
1977	49,123	53,037	458	268	102,886
1978	54,246	30,068	123	152	84,589
1979	12,548	25,046	25	158	37,777
1980	10,986	40,454	96	43	51,579
1981	19,198	40,234	218	17	59,667
1982	19,476	72,840	211	59	92,586
1983	16,200	86,234	122	51	102,607
1984	16,517	98,923	49	–	115,489
1985	36,567	118,463	35	2	155,067
1986	43,023	134,519	15	1	177,558
1987	37,677	70,151	29	–	107,857
1988	37,882	87,040	23	–	124,945
1989	19,557	132,579	2	–	152,138
1990	23,345	56,859	–	–	80,204
1991	13,618	100,381	8	–	114,007
1992	26,193	121,459	15	–	147,667
Totals	**496,283**	**1,308,615**	**2,169**	**2,572**	**1,809,639**
Ten–Year Average	27,058	100,661	30	5	127,754

* Jacks included.



Construction at Clearwater Hatchery, 1991.

Sawtooth Fish Hatchery, 1987.



Location of the Magic Valley Fish Hatchery, 1986.

Lyons Ferry Fish Hatchery construction, 1983.

Ken Billington, executive director of the Washington Public Utility Districts' Association, claimed his organization was "stunned" by the expenses involved. He questioned whether the Corps had not requested Congress to fund a plan providing much more compensation than the law required. BPA shared this sentiment. Noted Bonneville Power Administrator Donald Hodel, "We are greatly disturbed at the magnitude of the compensation measures proposed . . . and the extent to which payment for such compensation is intended to be allocated to power revenues." However, with the damage to fish and the need for mitigation by now clearly apparent, neither the Corps nor Congress was prepared to incur the further wrath of other Northwest residents. Congress would direct the Corps to build hatcheries despite the objections. [37]

The Walla Walla District ended up remodeling or building nine hatchery complexes. These were to hatch more than 27 million juvenile salmon and steelhead annually, the number believed necessary to insure an annual return of 132,000 adult fish. In addition, hatcheries constructed by the Corps were to propagate more than 300,000 trout annually. Announcing this plan to preserve fish runs was the easy part. Finding suitable hatchery locations proved a more difficult matter.

Water problems slowed Corps' progress in finding hatchery sites. Indeed, the major problem at all potential sites was obtaining an adequate supply of water. A reliable water source within a specific temperature range was the most important consideration for hatchery operations. Walla Walla estimated that the total water supply necessary for its hatcheries would be sufficient to supply a city of two million people. In addition, different fish needed different types of water. Steelhead smolts could be ready for release in a year in water temperatures of 50 to 55 degrees; expenses and hatchery size could be reduced if the fish did not have to be kept more than a year. That meant steelhead hatcheries should have a groundwater supply, if at all possible, because water usually came out of the ground at about the right temperature. But spring and summer chinook salmon have about an 18–month rearing cycle and needed colder water. So the Corps preferred to find sites with adequate river water for chinook hatcheries. [38]

The District found a good site at Lyons Ferry, Washington. It knew a plentiful supply of water existed there because of the problems it had encountered at the Marmes archaeological site nearby. Indeed, Lyons Ferry had such a reliable ground water supply that the Corps located there both hatcheries promised to the state of Washington. [39]

The Boise Cascade Corporation came to the assistance of the District in locating two other hatcheries. The corporation had previously donated land at McCall to the Idaho Department of Fish and Game with the provision that it be used as a hatchery. When the Corps approved this site for a Compensation Plan facility, Boise Cascade agreed to that use of the land. The Engineers then moved rapidly. First funding for the Compensation Plan became available in 1978, and by 1979 the McCall hatchery was rearing fish. Boise Cascade then made a similar donation of property on Lookingglass Creek in Oregon for another hatchery. [40]

Even with this success, by 1980 the District was once again under fire. It had completed only one hatchery and found locations for only three others. Costs greatly exceeded expectations, while fishery agencies pressured the Corps to complete the momentous task of replenishing fish runs.

Because it proved so difficult to find suitable sites, the District became involved in some difficult, at times controversial, hatchery development projects. During the period from 1977 through 1980 the Corps investigated hatchery sites in southern Idaho's Thousand Springs area for a steelhead location. The region has excellent ground water, and is famous for its commercial trout raising and state and federal hatcheries. The District originally investigated the possibility of expanding the Hagerman National Fish Hatchery. It would rear about half of the steelhead required for Idaho's Salmon River, with the remainder being raised at a new hatchery using Malad Springs water near Hagerman. To develop the new hatchery, the Corps would have to construct a collector system adjacent to the Malad River, build a pipeline through rugged terrain, and set the hatchery on private land. As planning progressed, local residents expressed concern about the impacts on downstream water quality and about the project's effects upon a species of sculpin being considered for listing as an endangered species. The Corps backed away from this project and began looking for other sites in the area.

Representatives from three existing commercial trout hatcheries contacted the District. One hatchery had an inadequate water supply and was quickly eliminated. The owners of another decided not to sell. That left Crystal Springs in southern Idaho as the only eligible commercial hatchery site available. The existing facilities were not suitable for steelhead rearing. But the water supply was adequate and site location, geology, and topography excellent for hatchery development. In March 1981, the Corps bought the property for $3.4 million.

The transaction immediately touched off a controversy among local trout producers who questioned the hatchery's appraised value, the estimated federal cost of rearing steelhead, and the lack of opportunity for local growers to rear fish for the Compensation Plan. Because of the outcry, the Chairman of the House Committee on Public Works and Transportation asked the General Accounting Office (GAO) to review the Corps' action. [41]

The GAO report concluded that the Corps' appraiser had over-valued the site, and the District had paid more than necessary. It also encouraged the Army Engineers to consider contracting with commercial hatcheries to produce the steelhead needed to meet Compensation Plan goals. It estimated that fish from commerical hatcheries would cost one-sixth the amount of those raised by the state or federal government.

The Walla Walla District disagreed strongly with the GAO report. It stood by its real estate appraisal. "This appraisal was based on a fair market value prepared . . . by a leading appraisal service in Boise," wrote Compensation Plan project manager Joe McMichael. "This firm is highly reliable with a vast amount of experience in the appraisal of all types of properties, including fish hatcheries. At the time when the appraisal was made, there had been no sales of hatchery facilities for several years for use as a basis comparison, and the appraisers had to rely on income and cost data." As McMichael pointed out, Corps officials all the way up to the Office of the Chief of Engineers carefully reviewed the appraisal and found it adequate and well supported. In the Corps' opinion, the "GAO's estimate of the value of the hatchery . . . was based only on numerous opinions and not by an appraisal."

The Corps also questioned the GAO's other conclusions. The District--and fishery agencies--doubted whether commercial hatcheries could produce sufficient numbers of healthy steelhead over long periods of time, as well as their ability to rear the fish at cost figures estimated by the GAO. Furthermore, as the Corps pointed out and the GAO agreed, the Compensation Plan did not authorize the agency to contract with commercial fish hatcheries. The GAO urged Congress to consider giving the Corps that special authority, but the issue became moot because, aside from Crystal Springs, no other commercial hatcheries existed in areas where the Corps needed to build. Consequently, state or federal governmental agencies would operate all Lower Snake Compensation Plan hatcheries.

To Joe McMichael, Crystal Springs was "the best buy we made on a compensation plan hatchery." Conceived to produce 291,000 pounds of steelhead, the Corps enlarged upon the original plan. The hatchery, renamed Magic Valley and operated by the State of Idaho, produces nearly 1.5 million steelhead juveniles annually, releasing them into the Salmon River drainage to begin their trip to the sea. "They are beautiful fish, raised in water that is disease-free," McMichael explained. [42]

Sometimes the Corps had access to adequate water but ran into other difficulties. Infectious Hematopoietic Necrosis (IHN) stalled construction of the biggest hatchery complex. When the Walla Walla District completed Dworshak Dam, it set at its base the world's largest steelhead hatchery. Dworshak National Fish Hatchery has a water supply from the Clearwater River. But, by the early 1980s, it became apparent the hatchery had serious IHN problems.

The disease causes fish to darken in color, lose their reflexes and ability to swim, and eventually die. It plagued other hatcheries in the Northwest, but Dworshak's losses gained considerable publicity. Sometimes only a few thousand fish died there, but some years IHN killed millions. Scientists began to speculate that water supply was a key to the disease. Hatcheries obtaining water from wells, instead of rivers, generally had fewer IHN problems.

But the Corps needed a chinook and steelhead hatchery along the Clearwater, a vital breeding tributary of the Snake. It looked at several locations, but the places with adequate water were remote, in regions that experienced tremendous snowfalls and sometimes did not have electricity. When Dworshak hatchery officials informed the District they could rearrange schedules to rear some chinook, the Corps agreed. To complement the operation, it also constructed three satellite hatcheries upstream.

Still, the Corps needed a larger facility, so it planned to construct a huge steelhead and salmon hatchery across the Clearwater, running river water into the complex. Originally scheduled for a mid–1980s construction start, the Corps delayed the project for years while researchers attempted to find a solution for IHN. Finally, the Corps discovered it could obtain better temperature control and experience fewer IHN problems if it used water from the reservoir behind Dworshak Dam rather than from the river. So it began construction in 1989 on the Clearwater Hatchery, to be operated by the Idaho Department of Fish and Game. [43]

The District did not always have such highly publicized difficulties as it did along the Clearwater and at Crystal Springs. At Lookingglass and Irrigon in Oregon, at Lyons Ferry in Washington, and at McCall and Sawtooth in Idaho, the Walla Walla District developed new or enlarged facilities and became the Corps' national leader in fish hatchery design. Clearwater would be the last of nine hatchery complexes constructed as part of the Lower Snake River Fish and Wildlife Compensation Plan. Together, the millions of smolts they produce have become a key element in Northwesterners' hopes of reviving the anadromous fish runs that formerly made their way into Idaho's wild rivers.

The 1990s began without all fish passage problems resolved. The number of adult fish returning to Idaho generally increased —— 56,115 salmonids passed over Lower Granite Dam in 1976 and 114,007 in 1991 —— although steelhead seemed to adapt better to the regulated waterway than salmon. And the runs fluctuated tremendously —— as they had in pre-dam days —— based on ocean conditions, snow pack, streamflow, and other factors. Differences of opinion still existed among numerous agencies and organizations over the best way to preserve runs. As some people worried that, while work to improve runs of hatchery fish seemed effective, these efforts might actually harm wild species. In 1991, the National Marine Fisheries Service listed the Snake River sockeye as endangered and was considering such designation for three other Snake River salmon. Such listings could drastically alter the way Northwesterners use their river's water, affecting everyone from recreationists to irrigators, barge operators, and electricity users. Despite more than 100 years of concern and study, people had not been able to solve the anadromous fish problem on the Columbia River system. Indeed, as the region entered a new decade, the issue had the potential to become the Northwest's most important and hotly contested environmental concern.

[1] The best background on the early years of the Columbia River fishery comes in U.S. Congress, *Bonneville Dam and Protection of the Columbia River Fisheries*, 75th Cong., 1st Sess., 1937, S. Doc. 87; and U.S. Congress, *The Salmon Fisheries of the Columbia River Basin*, 53d Cong., 2d Sess., 1894, S. Misc. Doc. 200. Also very helpful are Courtland Smith, *Salmon Fishers of the Columbia* (Corvallis: Oregon State University Press, 1979); and Francis Seufert, *Wheels of Fortune* (Portland: Oregon Historical Society, 1980).

[2] The quotation is in *Salmon Fisheries of Columbia River Basin*, p. 5.

[3] Still, many believed hatcheries the best possible solution to the anadromous fish difficulties, and in 1938 Congress passed the Lower Columbia River Fishery Development Program to encourage more hatcheries. See *Review of the History, Development, and Management of Anadromous Fish Production Facilities in the Columbia River Basin* (Columbia Basin Fish and Wildlife Authority, 1990), pp. 15–18. Also see *Bonneville Dam and Protection of Columbia River Fisheries*. The quotation is on p. 59. Also helpful in tracing the story of early hatcheries and fishing regulations in the Northwest is Gordon B. Dodds, *The Salmon King of Oregon: R.D. Hume and the Pacific Fisheries* (Chapel Hill: University of North Carolina Press, 1959).

[4] For background on federal compensation measures and the controversies surrounding them, see *The Mitigation Symposium: A National Workshop on Mitigating Losses of Fish and Wildlife Habitats* (Fort Collins, Co.: Rocky Mountain Forest and Range Experiment Station, 1979).

[5] The first quotation is in Gen. G.B. Pillsbury, Chief of Engineers, to McNary, 11 Je. 1937, box 37, McNary papers. The second is in Kelley to Walla Walla District Engineer, 20 Nov. 1970, RG 77, Acc. #T77–85–0022, WWD files, box 18, Seattle FRC.

[6] Pettit, interview with the authors, 26 Sept. 1990; McMichael, interview with the authors, 29 Apr. 1991.

[7] Ray Oligher, interview with the authors, 12 May 1992.

[8] For description of the Ice Harbor bypass system and alterations to the sluiceway over the years, see "Columbia River Juvenile Fish Mitigation Program: Ice Harbor Lock & Dam," Information Paper, 5 Oct. 1990, WWD PAO; and "Environmental Assessment, Ice Harbor Lock and Dam, Permanent Juvenile Fish Facilities," in "Ice Harbor Fishways" file, book 4, WWD EDF.

[9] "Columbia River Juvenile Fish Mitigation Program: Lower Monumental Lock and Dam", Information Paper, 19 Oct. 1990, WWD PAO; "Juvenile Fish Facilities," Information Paper, 3 Mar. 1987, WWD PAO.

[10] For descriptions of how the screens work and how they were invented, see "Juvenile Fish Transportation", Information Paper, Oct. 1990, WWD PAO; *Issue Backgrounder: Downstream Fish Migration* (Portland: Bonneville Power Administration, 1985), pp. 7–8; and *Dayton (Wa.) Chronicle*, 12 Je. 1988.

[11] For background on various changes in the Little Goose bypass systems to 1983, see "Little Goose Bypass Facilities," 7 Nov. 1984, and Brig. Gen. James van Loben Sels, North Pacific Division Engineer, draft reply to Sen. Robert Packwood, Feb. 1984, both in "Little Goose Project––Fish Facilities" file, book 6, WWD EDF; and Preston, *Walla Walla District History, Part II, 1970–1975*, p. 11. Also helpful in providing background was an authors' interview with John McKern, Walla Walla District Fisheries Biologist, 28 Nov. 1990.

[12] "Columbia River Fisheries," Information Paper, 30 Jy. 1986; "Juvenile Fish Facilities," Information Paper, 3 Mar. 1987, both in WWD PAO.

[13] For background on Operation Fish Run see Schubert, "From the Potomac to the Columbia: The Corps of Engineers and Anadromous Fisheries," pp. 79–88; Frank King, "Operation Fish Run," *Water Spectrum*, 9:4 (Fall 1977), pp. 7–11; "Juvenile Fish Transportation," Information Paper, Oct. 1990, WWD PAO; and Donn L. Park, *Transportation of Chinook Salmon and Steelhead Smolts 1968–80 and Its Impact on Adult Returns to the Snake River* (Seattle: National Marine Fisheries Service, 1980).

[14] For brief background on the Act, see *Issue Backgrounder: Downstream Fish Migration*; and Steve Crow, "Corps Dams Flow of Fish Funds," *Northwest Energy News*, May/June 1988, pp. 22–4.

[15] *Issue Backgrounder: Downstream Fish Migration*, p. 5.

[16] The McKern and ISSU quotations are in "Comments Pertaining to ISSU Press Release," (1987), "Juvenile Fish" file, Correspondence Files, WWD PAO. The other quotation is in *Ellensburg (Wa.) Daily Record,* 9 Feb. 1989. Also see *Lewiston Morning Tribune*, 12 Feb. 1987.

[17] For background on flume testing and construction, see numerous pieces of correspondence between the Walla Walla District and fishery agencies and tribes between 1983 and 1985 in "Little Goose Project--Fish Facilities" file, book 6, WWD EDF; and "Corps of Engineers Unveils . . . Fish Flume," News Release #90-19, 19 Apr. 1990, WWD PAO.

[18] The long and complicated debate in the late 1980s over how best to expend federal appropriations to preserve Columbia and Snake River fish has not yet been succinctly summarized. We are indebted to Steve Pettit of the Idaho Department of Fish and Game and John McKern of the Walla Walla District, Corps of Engineers, for providing background information in our interviews with them. The best printed summary can be found in the Portland *Oregonian*, 3 Jy. 1988. The debate was the subject of much media attention in the period from 1987-89, and we have relied heavily on various newspaper reports, several of which are cited below.

[19] The quotations are in, respectively, *Christian Science Monitor,* 29 Dec. 1988; and *Pocatello Idaho State Journal,* 27 Jy. 1989.

[20] Quotations are from Pettit interview.

[21] Portland *Oregonian*, 3 Jy. 1988.

[22] Oligher interview.

[23] For Hatch, see Portland *Oregonian*, 3 Jy. 1988. For Valentine, see E. Paul Peloquin, Corps Wildlife Biologist, memorandum, "Office of Environmental Oversight Site Inspection", 3 Je. 1987, "Lower Snake River Compensation Plan--General" file, book 24, WWD EDF.

[24] The quotations are in, respectively, *Boise Idaho Statesman*, 18 Mar. 1988, 15 Apr. 1988, and 11 Mar. 1988.

[25] The first quotation is in a transcript of a videotape by KOAP TV, Portland, "The Millions That Got Away," 10 May 1988. A copy is in Juvenile Fish file, Correspondence Files, WWD PAO. The second is in Portland *Oregonian,* 3 Jy. 1988.

[26] The quotation is in "Columbia River Juvenile Fish Mitigation Program: Ice Harbor Lock and Dam," Information Paper, 5 Oct. 1990, WWD PAO.

[27] Cost figures are from "Lower Snake River Fish and Wildlife Compensation Plan," Je. 1987; and "Columbia River Juvenile Fish Mitigation Program," Information Paper, 5 Oct. 1990. Both in WWD PAO.

[28] The cost figures for the Compensation Plan are from "Lower Snake River Fish and Wildlife Compensation Plan," Information Paper, 4 Oct. 1990, WWD PAO.

[29] For background on the history of the plan, see Walla Walla District Engineer Col. Richard Connell to Division Engineer, 13 Apr. 1973, RG 77, Acc. #T77-85-0022, WWD files, box 27, Seattle FRC; Walla Walla District Engineer Col. Nelson Conover to Ken Billington, Washington Public Utility Districts' Assn., 25 Aug. 1975, Acc. #3181-5, box 170, Magnuson papers; and Conover to Donald Hodel, Bonneville Power Administration, 18 Jy. 1975, Acc. #88-1-16, Washington State Game Department papers, "General Files," box 3, Wash. Arch. Also see Jameson, Reed, and Petersen, *Walla Walla District History, 1975-80*, pp. 94-100; 292-93.

[30] Willard Sivley, interview with the authors, 28 Apr. 1992.

[31] Morris' quotation is in Bill Vogt, "Questioning the Corps," *Outdoor Life*, 154:2 (Aug. 1974), p. 10. The Sierra Club quotation is Charles M. Clusen, ed., *Engineering a Victory for Our Environment: A Citizen's Guide to the U.S. Army Corps of Engineers* (Sierra Club, 1973), preface. Information on the Walla Walla District environmental section came in the Sivley interview. For the gradual buildup of environmentalists nationally between 1938 and 1977, see Richard H. Macomber, "What is Happening Now in the Environmental Area in the Corps of Engineers?" in John Cairns, Jr. and Kenneth Dickson, eds., *The Environment: Costs, Conflicts, Action* (New York: Marcel Dekker, 1974), esp. pp. 123-24; Daniel Mazmanian and Mordecai Lee, "Tradition be Damned! The Army Corps of Engineers is Changing," *Public Administration Review*, 35:2 (Mar/Apr 1975), pp. 166-72; and *Spokane Spokesman-Review*, 29 Jy. 1979. For the development of the recreation and environmental branch, see Lt. Gen. William Cassidy, A "New Look at Water-Resources Development," *Military Engineer*, 58:385 (Sept./Oct. 1966), pp. 323-25; and Albert Cowdrey, "Pioneering

Environmental Law: The Army Corps of Engineers and the Refuse Act," *Pacific Historical Review*, 46:3 (Aug. 1975), esp. p. 346. The impact of NEPA and the environmental movement upon the Corps has been the subject of several works. See, for example, C. Grant Ash, "Three–Year Evolution," *Water Spectrum*, 5:4 (1973), pp. 28–35; *Bureaucracy, Policy and Change: The Impact of Environmentalism in the Corps of Engineers* (Washington, D.C.: Board of Engineers for Rivers and Harbors, 1975); Daniel Mazmanian and Jeanne Nienaber, *Can Organizations Change? Environmental Protection, Citizen Participation and the Corps of Engineers* (Washington, D.C.: The Brookings Institution, 1979); Martin Reuss, *Shaping Environmental Awareness: The United States Army Corps of Engineers Environmental Advisory Board, 1970–1980* (Washington, D. C.: Office of the Chief of Engineers, Historical Division, 1983); Steven Weller, "Public Policy as Law in Action: The Implementation of the National Environmental Policy Act of 1969 by the U.S. Army Corps of Engineers" (unpublished Ph.D. dissertation, Cornell University, 1979); Jeffrey Kim Stine, "Environmental Politics and Water Resources Development: The Case of the Army Corps of Engineers During the 1970s" (unpublished Ph.D. dissertation, University of California at Santa Barbara, 1984); and Michael C. Robinson, "The United States Army Corps of Engineers and the Conservation Community: A History to 1969," unpublished typescript available at Office of History, U.S. Army Corps of Engineers, Ft. Belvoir, Va.

[32] The quotation is in Kelley to Donald Johnson, Regional Director, Bureau of Commercial Fisheries, 29 Sept. 1970. Also see J. Horvell Brown, Field Supervisor, Planning Committee of the Steelhead Study Group, River Basin Studies to Walla Walla District Engineer, 16 Je. 1969. Both in Acc. #79–7–480, Department of Fisheries papers, "Lower Snake River Compensation Plan" files, box 0061–76, Wash. Arch.

[33] See J. L. Coniff, Washington State Asst. Atty. Gen. to Walla Walla District Engineer Col. Richard Connell, 17 Nov. 1971, RG 77, Acc. #T77–85–0022, WWD files, box 27, Seattle FRC.

[34] Sawyer to Walla Walla District Engineer, 26 Jan. 1972, Ibid.

[35] Cumulative fish passage statistics for Columbia and Snake River dams can be found in the *Annual Fish Passage Report*, jointly issued by the Portland and Walla Walla Districts. For Corps' support of the final proposal and the agency's desire to see that Congress pass it, see Connell to Division Engineer, 13 Apr. 1973, RG 77, Acc. #T77–85–0022, WWD files, box 27, Seattle FRC; and Conover to Billington, 25 Aug. 1975, Acc. #3181–5, box 170, Magnuson papers. The quotation is from the Sivley interview.

[36] Sivley interview; Oligher interview.

[37] The quotations are in Billington to Conover, 1 Aug. 1975, and Hodel to Conover, 3 Sept. 1975. Also see Chief of Engineers Lt. Gen. W.C. Gribble, Jr. to Sec. of the Army, 27 Apr. 1976; Billington to Members of the State of Washington Congressional Delegation, 4 Sept. 1975; Hodel to Billington, 12 Aug. 1975; Conover to Billington, 25 Aug. 1975; and Billington to Conover, 29 Aug. 1975. All in Acc. #3181–5, box 170, Magnuson papers.

[38] Minutes of 5 Dec. 1979 meeting between Walla Walla District and North Pacific Division on funding for Lower Snake Comprehensive Plan, Program Development files, "Lower Snake River Fish and Wildlife Compensation Plan," NPD; Walla Walla District Engineer Col. Henry Thayer to Division Engineer, 18 Jan. 1980, Ibid; McMichael interview.

[39] *Dayton [Wa.] Chronicle*, 9 Aug. 1979; *Tri–Cities Herald*, 13 Sept. 1979; *Walla Walla Union Bulletin*, 14 May 1978.

[40] Chuck Anderson, "Boise Cascade Donates Land for Salmon Hatchery," Idaho Department of Fish and Game news release, 8 Feb. 1978, "McCall Hatchery," folder, WWD PAO; Enterprise [Or.], *Wallowa County Chieftain*, 29 Mar. 1979. For more background on the McCall Hatchery, see "Idaho Hatchery Construction to be First of a Series," *Pacific Builder and Engineer*, 7 Apr. 1980, pp. 26–8; Boise Idaho Statesman, 15 Apr. 1979; and *McCall Star–News*, 29 Mar. 1979. Also helpful was the Sivley interview.

[41] For background on the Crystal Springs controversy, see Corps of Engineers' *Acquisition of Fish Hatchery Proves Costly, CED–81–109* (Washington, D.C.: General Accounting Office, 1981); and *Twin Falls Times–News*, 28 Je. 1987. The Corps' response to the GAO report can be found within the report, and also in various inter–departmental memos and correspondence for the period from 1981–83 in "Lower Snake River Compensation Plan," file 3, Correspondence Files, WWD PAO. Also see Joseph McMichael, "Magic Valley Hatchery GAO Report," typescript, 1985, Lower Snake River Fish and Wildlife Plan office files, WWD. We also relied on the McMichael interview for background information.

[42] "Magic Valley Hatchery," Information Paper, 5 Je. 1987, WWD PAO; McMichael interview.

[43] For IHN and the Clearwater Hatchery, see *Lewiston Morning Tribune*, 26 Nov. 1984, 27 Nov. 1984, 23 Je. 1988, 14 Jy. 1988, and 10 Aug. 1989; and Orofino [Id.] *Clearwater Tribune*, 24 Aug. 1989.

Deer are commonly found in the lower Snake River projects wildlife habitat areas.

Chapter 10
Wildlife

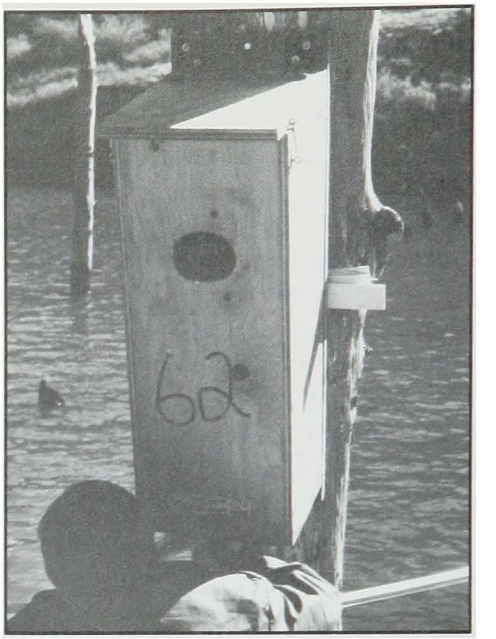
River edges--riparian zones as scientists call them--are wildlife oases. Flood soils deposited along river banks over thousands of years create lush floral habitats attractive to a diverse lot of birds and animals. These are among the richest ecosystems on earth. Even in arid country, such as the land through which the lower Snake River flows, the riparian community teems with life. The lower Snake region looked barren and desolate to early explorers, but it was always home to wildlife. In 1972, an estimated 22,000 pheasants, 57,000 quail, 20,000 partridge, 52,000 chukars, 120,000 mourning doves, 8,400 cottontails, and 1,800 deer lived within one-half mile of the river's edge between Pasco and Lewiston. (Several of the bird species had been introduced to the region following settlement of the area.) Islands and shorelines provided additional resting, nesting, and feeding habitat for thousands of migrating waterfowl. Dams inundated virtually all of this land. These birds and animals--and thousands of often-forgotten creatures such as mice and snakes--could not simply move on when the reservoirs rose. The Snake's hard-scrabble uplands offered little to entice or support such animal settlement. Mitigating for these wildlife losses proved to be one of the most complicated aspects of the Lower Snake River Fish and Wildlife Compensation Plan. [1]

Traditionally, a gap occurs between the completion of a federal water project and the resulting compensation for fish and wildlife. Fish and game agencies and the Corps began working on a compensation proposal for the lower Snake River in 1959, first on a project by project basis, and then for all four dams as a unit. Although Congress did not authorize the Compensation Plan until 1976, the Corps made some improvements for wildlife on project lands it had acquired during dam construction. Working with Idaho and Washington game agencies, it planted trees and shrubs, created meadows and pastures, built goose nesting platforms, birdhouses, and quail roosts. It also created artificial islands for migratory waterfowl using deposits dredged from the river to keep navigation channels open. [2]

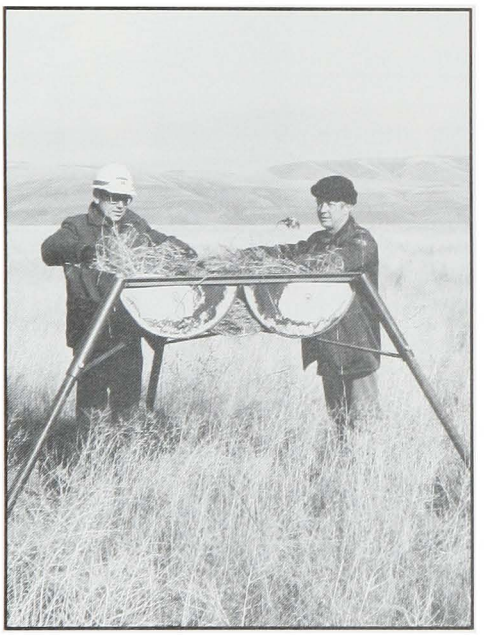
Utilizing these on-project lands, the Corps developed habitat units with little controversy and considerable success. Geese did especially well, and by the late 1980s, the Washington Department of Game estimated more geese nested in the project area than before the dams. Deer also fared well. It is possible more deer wintered along the river in 1990 than before Ice Harbor went into operation.

But other wildlife suffered. For example, in 1987 the Washington Department of Game estimated that 120,000 game birds once lived on the lower Snake, but that existing habitat supported only 2,000. Lands once home to 13,000 furbearing mammals now had only 500. Nearly 95,000 wintering songbirds formerly survived along the river, but by 1987, the existing habitat could provide for only 3,000. Of course, just as dams were not the only reason for declines in wild fish, the loss of Snake River riparian lands could not be blamed completely for such wildlife declines. Other human actions--such as an increased use of toxic farm chemicals and a loss of wildlife habitat and wetlands to development--also took their toll on the wildlife that frequented the Snake River.

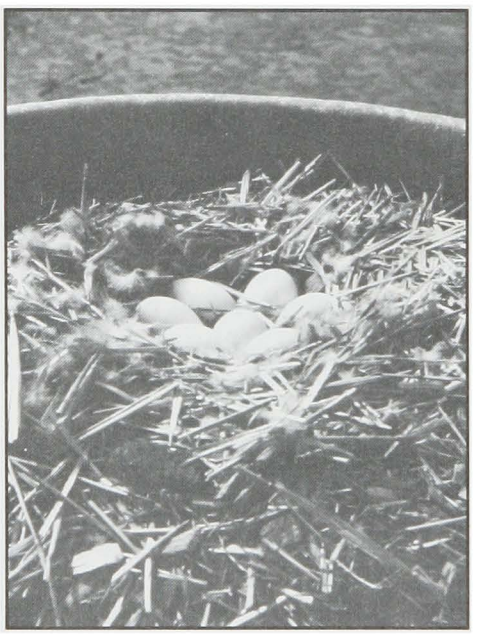
Quail roost built by Washington State Department of Game under Corps of Engineers contract, near Lower Granite Dam, 1982.



Wood duck box installation.



Placing goose nests on New York Bar, 1971.

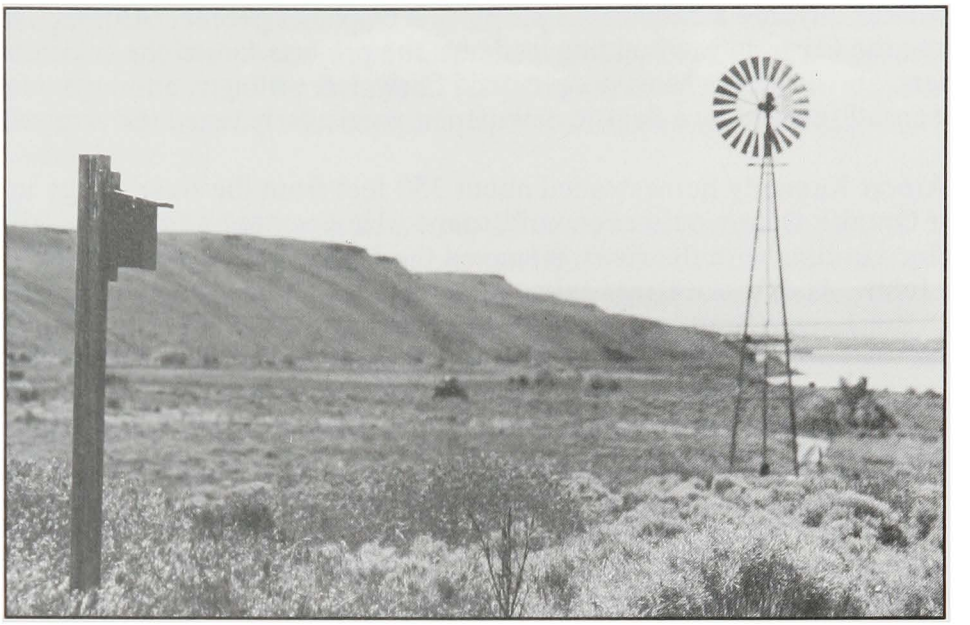


Goose nest eggs in tripod goose tub.

Goose nest survey.

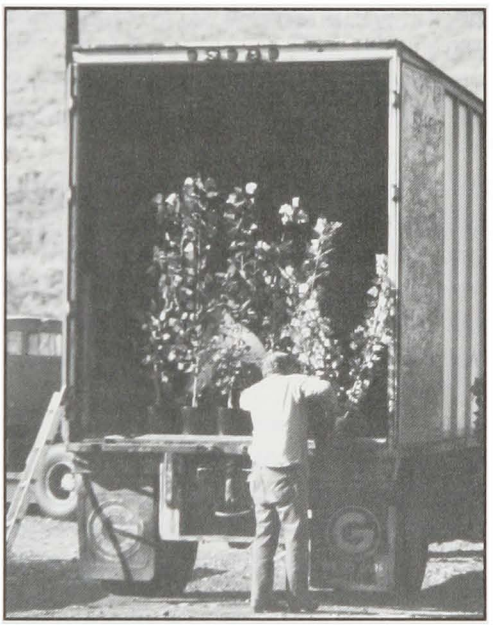
The Corps had not planned that the habitat units developed on project lands would compensate for all wildlife losses. But purchasing additional "off project" property, required by Congress when it approved the Lower Snake River Fish and Wildlife Compensation Plan in 1976, proved difficult. As a result, implementation of that part of the Compensation Plan relating to wildlife was delayed later than the Corps and game agencies had envisioned when establishing project goals.

Wildlife habitat unit planting.



Big Flat wildlife habitat unit, 1986.

Worker at wildlife habitat unit.



Preparing for planting at wildlife habitat unit.

Residents of the Northwest generally agreed on the need to compensate for lower Snake fish losses despite heavy expenses. But there existed no broad consensus on proposals for wildlife mitigation. The Compensation Plan called for acquiring 24,150 acres. It would be difficult to obtain that much property without acquiring it through condemnation, and those living near the lower Snake were not about to sit idly while the government took away their farms and ranches.

Almost anytime a dam floods property it displaces people. Although few lived along the lower Snake at the time the Corps began building its dams, the projects forced the relocation of some town dwellers, ranchers, and farmers. Most people, paid fairly, left willingly, although a few protested, and one particular case, sensationalized by a Seattle newspaper, particularly vexed the Army Corps of Engineers.

Albert Kennedy homesteaded about 350 feet from the river's edge in 1896, just upstream from where Lower Granite Dam would eventually stand. He operated a fruit farm. By the mid-1960s, his son John, a bachelor familiar with the river, managed the family holdings. Most people referred to Kennedy as Snake River John. And Snake River John, who spent his entire life on his father's homestead, did not want to leave. But Lower Granite reservoir would inundate his land. The Corps and Kennedy entered into land-purchase negotiations in 1966, but could not agree on a price. The Corps began condemnation proceedings. It was a common procedure. Many people whose homes are to be flooded refuse the government's first offer, and the cases go to court. But in the instance of Snake River John, the *Seattle Post-Intelligencer* decided to publicize the matter.

When the *Post-Intelligencer* heard of Snake River John, it immediately took the Army Engineers to task for trampling on "a poor little fellow like him" by cutting down his orchard, ruining his hog business, and refusing to pay a fair price for his land. [3]

Upon reading about the case, constituents flooded the offices of Washington Senators Henry Jackson and Warren Magnuson, demanding that the Corps treat John Kennedy and other river residents fairly. Jackson and Magnuson requested a response from the Corps, and the Chief of Engineers tactfully pointed out that the agency had followed proper procedures. Indeed, there was nothing particularly unusual about John Kennedy's case, other than that the *Seattle Post-intelligencer* chose to make an issue of it. [4]

The storm of publicity soon passed. The *Post-Intelligencer* dropped its accusations. As a staff member in Congresswoman Catherine May's office wrote during the episode, "The *Post-Intelligencer* always has a crusade goal —— they evidently discovered the Army Engineers during the Marmes trouble, so now have a new crusade going." Several of Senator Jackson's constituents proved even more critical of the shallow journalism, including one who wrote: "After reading the enclosed excerpt from the Army Corps of Engineers it sounds to me like the *Seattle P.I.* was guilty of an old Hearst trick, i.e. sensationalism and bleeding hearts to sell their crummy ... paper." [5]

It was much ado about very little, and as a particular irony, Snake River John eventually worked as a seasonal employee at Lower Granite Dam during spring and summer fish migrations, living in a small mobile home by the river, reminiscing about the old times and showing little bitterness. "They've all been real good to work for, all my bosses," he told an interviewer in 1982. But, as the Corps announced plans to obtain property for wildlife compensation along the Snake, farmers remembered stories of people like Snake River John, who had lost their farms and their ways of life. Many of those now threatened decided to resist yet another government incursion. [6]

The farmers' adamance took the Corps by surprise. By the early 1970s, the agency had grown used to controversy regarding fish runs, but was unprepared for the contention surrounding land acquisition for wildlife. As Walla Walla District Engineer Colonel Nelson Conover noted after a particularly heated public meeting, "I really don't think I'm a very stupid man, but I'd have to be an awfully stupid man if I didn't get the message that a helluva lot of people were concerned." [7]

Looking at the situation retrospectively, perhaps the Walla Walla District should not have been surprised. As one specialist noted in 1979 at a national conference on compensation, "The mention of mitigation in agricultural circles conjures up a wide range of attitudes--most of which are hostile." [8]

By the 1970s, the United States annually lost more than six million acres of farmland to development and soil erosion. That was the equivalent of losing one square mile every hour, every day. Farmers in some areas became adamant in demanding that "not one more inch" be forfeited. At the same time, environmentalists clamored for fish and wildlife compensation. The conflict was bound to lead to confrontation as Congress increasingly required federal agencies to mitigate. [9]

The Lower Snake Compensation Plan proposed the acquisition of 8,400 acres for upland game bird production and hunting, 15,000 acres contiguous to lower Snake River project lands for chukar habitat and hunting, and about 750 acres of fishing access. The Plan called for the District to purchase the chukar land. The State of Washington, using money provided by the Corps, would acquire the property for upland game and the bulk of the fishing access, with the State of Idaho procuring about 50 acres of fishing access, again with Corps funds. [10]

The Corps held a series of public meetings to solicit input prior to Congressional authorization of the Compensation Plan. It became evident that many people opposed these far-reaching wildlife mitigation measures. At a public meeting in Colfax in 1973, participants unanimously opposed any increase in government ownership of local lands. Not only were farmers concerned about losing property, they also worried about problems that might arise with increased hunting. Columbia County's commissioners, who would become the proposal's most outspoken critics, voted official opposition to the plan in 1973, 1974, and 1975. At one point, the Walla Walla District briefly considered separating the fish portion of the Compensation Plan from the wildlife portion, because of the increasing outcry over acquiring property to mitigate wildlife losses. Some in the District believed the fish proposals would pass Congress with much less difficulty by themselves. But state fish and game agencies insisted on keeping the package together, fearing that to separate the two components might doom wildlife compensation altogether, because it had proved so unpopular in early public hearings. [11]

Despite the early concerns raised by local residents, Congress mandated the Corps to compensate for losses, and passed a Compensation Plan requiring the extensive land acquisitions. Opponents became more outspoken. Eventually, the Washington State Grange, the Washington Association of Counties, the Organization for the Preservation of Agricultural Land (OPAL), the Whitman County Planning Commission, and the Whitman County commissioners all came out against the concept. [12]

Opponents had several concerns. Many argued against the loss of local property control and a resulting slip in tax revenues. "The Federal and state governments already own approximately one-third of this county," declared Columbia County Commissioner Vernon Marll. "Further acquisition . . . by Federal and state agencies would serve only one purpose--to lower the economic base and set a trend toward the eventual destruction of the economy of Columbia County." [13]

Most, though, leveled criticism specifically at the Corps' ability to condemn land. On a trip to the Walla Walla District in 1976, Chief of Engineers Lieutenant General John Morris explained that the Corps always attempted to purchase lands using the willing buyer-willing seller approach. But "if no one wants to sell, then I'm left with a problem that I can't resolve." The Walla Walla District recommended to the Chief that the agency purchase lower Snake compensation lands only on a willing seller basis, but Morris worried about the precedent this might set. "If we go that way," he asserted, "it will be the only place in the United States where land is acquired by this manner. Such a plan could be extremely difficult to administer on a national basis." In 1976, the Chief's office overruled the District's recommendation, stating that the Corps would condemn land if necessary to obtain mitigation property. [14]

This decision brought strong protests from local residents. "All through the . . . hearings the people were told the . . . compensation would be done on lands acquired only by willing sellers," charged the chairman of OPAL. "If this is to be changed, we feel the whole program should be sent back to the District office and further hearings be held so the people involved have an opportunity to express their views." Columbia County's commissioners suggested that compensation could be accomplished on lands already under state and federal control. [15]

Only a minority thought the Corps could achieve adequate compensation on existing government property, much of it rip-rapped riverbank lands or unproductive canyon sides. But Northwest politicians recognized a groundswell when they saw one and encouraged the Chief of Engineers to reconsider the Corps' condemnation proposal. Idaho's Senator James McClure joined Washington's Henry Jackson and Warren Magnuson in opposing "the Corps of Engineers' authority to acquire land or easements for that plan through condemnation proceedings." The governors of Washington, Oregon, and Idaho likewise came out against the idea. The Corps agreed to their requests. It first would attempt to purchase all necessary land via the willing seller concept, waiting until 1983 to determine whether it would be necessary to revise downward the number of acres it would acquire, revert to condemnation, or find suitable alternatives, such as contracting with farmers to leave parcels of land unharvested for wildlife. [16]

In 1983, the Walla Walla District prepared its special report to Congress about purchasing off-project lands: "Owners do not want to sell strips of land through their holdings. They do not want to enter into perpetual easements that will be a burden to their heirs, to future owners, or that will affect the saleability of their land. Owners do not want unlimited public access on their land, they want to be able to control public use and hunter/livestock interactions." After five years of trying, the Washington Department of Game and the Corps had made little progress in acquiring acreage for wildlife mitigation. [17]

Despite these difficulties, the Walla Walla District recommended again in 1983 that "it would be inappropriate to abandon [the willing seller] concept. The state agencies feel that use of condemnation could jeopardize other programs they administer." The Corps and the state, in other words, would try again. The Corps also agreed not to acquire land without the concurrence of county planning commissions, and to concentrate land purchases outside of Columbia County, since commissioners there remained vigorously opposed to any federal acquisition of property. [18]

Most important, the Walla Walla District, in an effort to break the impasse in land purchases, made an even more significant recommendation in its 1983 report. The Corps suspected that its biggest difficulty came from landowners unwilling to chop up farms to sell small parcels meeting the specific requirements of the Compensation Plan. So the District recommended that it and the Department of Game be permitted to purchase entire farms and ranches, even though some land might not meet ideal compensation standards. The request went to the Chief of Engineers office, which approved it in 1985. In 1986, Congress authorized this important modification. For the first time, the Corps expressed optimism it would be able to purchase the land required to compensate for wildlife losses. "The acquisition program had been largely unsuccessful due primarily to reluctance of landowners to sell the limited interests in land which the Government was authorized to buy," wrote Division Engineer General George Robertson in 1987. "The Government has suddenly obtained the opportunity to acquire the necessary lands to meet the requirements of the program." [19]

Yet the Corps continued to face difficulties and criticism, particularly from its partner in the Compensation Plan, the Washington Department of Game. Bruce Smith, the Department's eastern Washington regional director, came to suspect that upper Corps echelons did not share the District's desire to fully implement the Compensation Plan's acquisition goals. When the District informed the Department that only $200,000 of a requested $1.7 million would be available for land acquisition in 1987, he exploded. "They've left us high and dry once again," he charged, "and we can't seem to get through the layers of Corps

administration to identify an accountable party. We'd like to know just where the buck stops on this, and just who really is committed to wildlife compensation." [20]

Actually, the culprit was the Reagan administration, which the next year eliminated all money for the land purchases. In fiscal year 1990, Congress gave the District $861,000 for property acquisition. The five-year clock recommended in the 1983 special report to Congress began ticking; all land purchases were to be completed by fiscal year 1994. Some District employees questioned whether it could meet the goals even by then. "Already, [Walla Walla District] believes that an extension of the FY 1994 'sunset provision' will be needed to fulfill the objectives of the Compensation Plan," wrote Richard Carlton, the District's Real Estate Division Chief. But others remained optimistic. "Its been a pretty harmonious year," noted Compensation Plan project manager Joe McMichael in 1991. "I think you're going to see success. I have high hopes." [21]

The Corps' problems and frustrations were many. Indeed, at times it seemed an overwhelming task. Once Congress passed the Compensation Plan, both the District and the Washington Department of Wildlife--successor to the Department of Game--began scrambling, spending thousands of hours attempting to find suitable property. Once they identified usable land with owners willing to sell, the county planning commission had to approve the purchase. Just meeting those requirements would have caused immense difficulties for agencies attempting to acquire 24,150 acres. But there were other problems as well. Owners frequently expected more money than the land's appraised value, while other purchasers competed for the limited parcels of land available for sale. [22]

Still, overriding all the difficulties was the lack of dependable funding. "Many times in past years," Carlton wrote, "we have cultivated prospects and initiated our contacts with individual owners only to inform them in a few months that we cannot make an offer due to lack of funding. This destroys our credibility as a reliable and earnest buyer in the market place. It is imperative to the overall success of the Compensation Plan that adequate and more predictable levels of funding be sustained. This is critical to our capability to attain full compensation." [23]

As the 1990s began, the Corps had purchased approximately 4,000 acres, and Congress had approved funding for acquiring the additional 20,000. The Corps has until September 1994 to complete that task. After that, if the District has been unsuccessful, Congress will have to reauthorize land purchases, or give up on meeting all the Compensation Plan goals.

The combination of a lack of dependable money and the inability to condemn property, together with the unwillingness of most landowners to part with land at its appraised value, had frustrated the Corps throughout the late 1970s and 1980s. The agency entered the 1990s committed to meeting its wildlife compensation obligations, but it still faced the handicaps that had plagued it until then.

Endnotes

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[1] Good summaries of the impact of the dams on Snake River riparian habitat can be found in the numerous project Environmental Impact Statements published by the Walla Walla District in the 1970s and 1980s, available at the District library. For a detailed analysis of the impact of dams on riparian zones generally, see Constance Elizabeth Hunt, *Down by the River: The Impact of Federal Water Projects and Policies on Biological Diversity* (Covello, CA.: Island Press, 1988). The numbers of birds and animals to be affected are cited in Norm Nelson, Jr. and Richard Furniss, "Disaster on the Snake," *Outdoor Life*, 149:5 (May 1972), p. 100.

[2] For background on the development of habitat units on project lands see John McKern, "Mitigation Can't Wait," *Water Spectrum*, 7:4 (Winter 1975–76), pp. 7–16; *Special Report for Congress: Lower Snake River Fish and Wildlife Compensation Plan* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1983); David Mudd, "High Living, Canada Goose Style," *Washington Wildlife*, Spring 1987, pp. 9–11; and "Lower Snake River Fish and Wildlife Compensation Plan," Information Paper, 4 Oct. 1990, WWD PAO. Also helpful for more technical information is the Walla Walla District's *Design Memorandum for Wildlife Habitat Development* and its various supplements, all available at the District library.

[3] The quotation is in *Seattle Post–Intelligencer*, 18 Mar. 1969. The *Post Intelligencer* ran several articles about the case in this time period.

[4] For the plethora of mail regarding Snake River John see Acc. #3181–5, box 146, Magnuson papers; Acc. #3560–4, box 84, Jackson papers; and box 342, May papers.

[5] The first quotation is in "Jean," staff member in May's Yakima office to May, 24 Mar. 1969, box 342, May papers; the latter in James Sheed, Seattle, to Jackson, 21 Apr. 1969, box 84, Jackson papers.

[6] The quotation is in *Lewiston Morning Tribune*, 3 May 1982.

[7] *Record of Public Meetings, Special Lower Snake Report* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1973), p. IV–53.

[8] R. Neil Sampson, "Agriculture and Mitigation," in *The Mitigation Symposium: A National Workshop on Mitigating Losses of Fish and Wildlife Habitats* (Ft. Collins, CO.: Rocky Mountain Forest and Range Experiment Station, 1979), p. 36.

[9] Ibid.

[10] See "Lower Snake River Fish and Wildlife Compensation: Wildlife Compensation," Information Paper, 4 May 1988, WWD PAO.

[11] Willard Sivley, interview with the authors, 28 Apr. 1992.

[12] *Lewiston Morning Tribune*, 26 May 1976, 19 Je. 1976, 3 Aug. 1976; *Pullman Herald*, 5 May 1979, 9 May 1979; *Dayton (Wa.) Chronicle*, 15 Jy. 1976.

[13] *Lewiston Morning Tribune*, 3 Aug. 1976.

[14] Chief of Engineers Lt. Gen. W.C. Gribble, Jr. to Sec. of the Army, 27 Apr. 1976, Acc. #3181–5, box 170, Magnuson papers; *Walla Walla Union Bulletin*, 27 Aug. 1976; *Waitsburg (Wa.) Times*, 15 Jy. 1976.

[15] Norman Hatley, President, OPAL to Gov. Daniel Evans, 27 May 1976; Board of Columbia County Commissioners to Evans, 29 Jy. 1976. Both in box 25–2–1095, Daniel Evans papers, Wash. Arch.

[16] Magnuson, Jackson, and McClure to Sen. Mike Gravel, Chairman of Senate Water Resources Subcommittee, 27 Aug. 1976; Governors of Washington, Oregon, and Idaho to Sec. of Defense Donald Rumsfeld, 28 Je. 1976. Both in Acc. #3181–5, box 170, Magnuson papers. For additional background, see *Dayton (Wa.) Chronicle*, 15 Jy. 1976, 9 Sept. 1976; *Lewiston Morning Tribune*, 26 May 1976; *Spokane Spokesman–Review*, 27 May 1976; *Walla Walla Union Bulletin*, 21 Feb. 1978, 5 Apr. 1979; *Pullman Herald*, 5 May 1979. Also helpful in providing background was an interview the authors had with Ray Oligher, Chief, Fish and Wildlife Section, Walla Walla District, 18 Nov. 1980.

[17] *Special Report For Congress: Lower Snake Compensation Plan*, p. 12.

[18] Ibid., pp. 13–14.

[19] Robertson memo to Chief of Engineers, 30 Jan. 1987, "Lower Snake River Compensation Plan––General files," book 23, WWD EDF. Also, see "Lower Snake River Fish and Wildlife Compensation Plan: Wildlife Compensation," Information Paper, 7 Dec. 1989, WWD PAO.

[20] Quoted in *White Salmon (Wa.) Enterprise*, 29 Jan. 1987. Also, see Smith to Walla Walla District Engineer Col. James Royce, 29 Dec. 1986, "Lower Snake River Compensation Plan–General" files, book 23, WWD EDF.

[21] Carlton memorandum to Chief, Engineering Division, 12 Sept. 1990. This correspondence was found in papers that had not yet been filed at the time of research, WWD EDF. Joe McMichael, interview with the authors, 29 Apr. 1991.

[22] McMichael interview.

[23] Carlton memorandum to Chief, Engineering Division, 12 Sept. 1990. This correspondence was found in papers that had not yet been filed at the time of research, WWD EDF.

Chapter 11
Asotin

The dividing line is not always precise when people refer to the "upper," "middle," and "lower" Snake. But, as the Corps of Engineers discovered, making that distinction can mean a great deal when a dam is at stake.

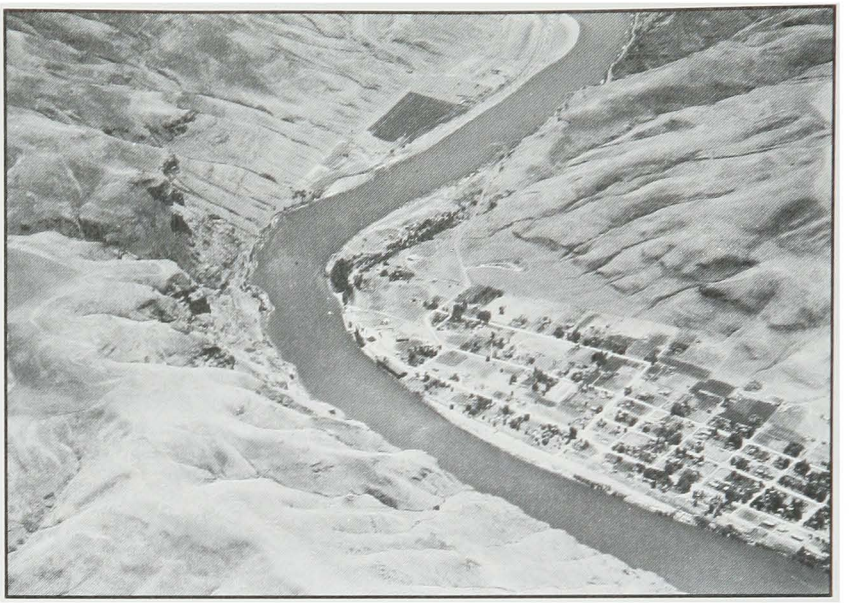
To the Corps, the town of Asotin, about seven miles upstream from Lewiston, separated the lower and middle sections of the river. Principally as a result of this decision made in the 1930s, the Corps constructed four rather than five dams between Asotin and Pasco.

When the Corps presented Congress its Snake River 308 report in 1934, Portland District Engineer Major Oscar Kuentz divided the document into two sections to facilitate discussion. In those days the Corps used only the terms lower and upper when referring to the Snake, and Kuentz claimed Asotin separated the two. His decision was not completely arbitrary. There were important differences in the river above and below Asotin. Above, the Snake narrowed and flowed through more rapids; few people lived in the surrounding country. Below, the river was wider and its banks supported more residents. Kuentz believed the government should improve only that part of the river between Pasco and Asotin, "as it is only in that section that improvements to benefit navigation are of sufficient importance to justify expenditures of public funds." Above Asotin, power showed greater potential than navigation. But, as it had when reporting on other Columbia and Snake river dams in the 1930s, the Corps claimed the region did not yet have markets to justify dams built primarily for hydropower. [1]

Actually, the Snake narrows and becomes more rapid a short way above Asotin, and had Kuentz made his division point farther upstream--say where the Grande Ronde enters the Snake, which is an equally logical site--there might today be a dam at Asotin.

However, Kuentz chose Asotin; and Congress, on the Corps' recommendation, authorized the Lower Snake River Project to include dams bringing slackwater to that town but not beyond. It did not grant authority for a Corps dam at Asotin until 1962. By that time national consciousness was changing. Many people viewed dams as more liability than asset. Facing political pressure from environmentalists, Congress would eventually deauthorize Asotin.

In the mid-1950s, the Walla Walla District proposed as its next Snake River project a series of three dams above Lower Granite: one at Clarkston, one at Asotin, and one eight miles above the Grande Ronde at China Gardens. The Engineers eventually dropped the Clarkston proposal, but in 1958, both the District and North Pacific Division recommended constructing Asotin as the next logical step in the development of the lower-to-middle Snake River. [2]



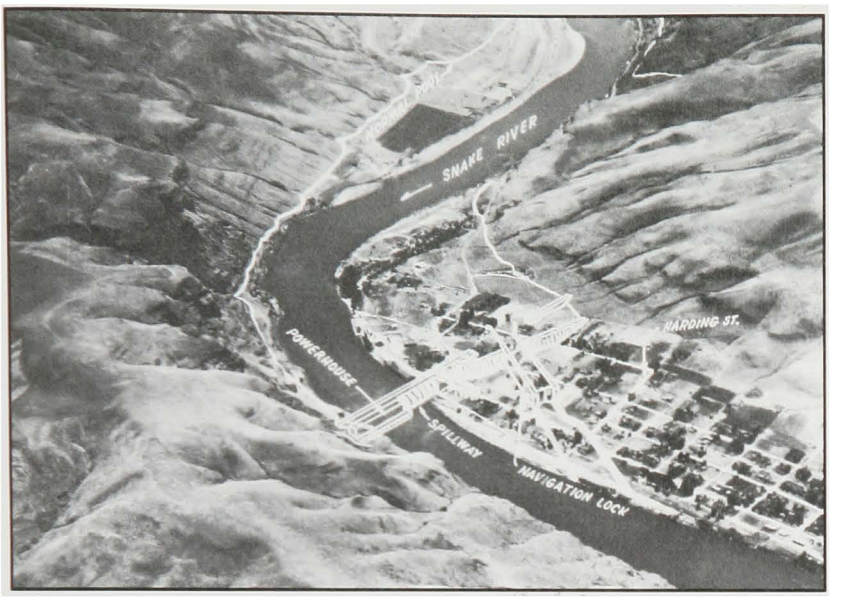
Town of Asotin.

But the navigational advantages of the Asotin Dam were always doubtful, in the 1950s just as much as in the 1930s. Few people lived above the dam to benefit from slackwater transportation. As a result, even more than on the Lower Snake River Project where hydropower produced more than 80 percent of total benefits, Asotin would be primarily a dam built for electricity. And in 1960, Lieutenant General Emerson Itschner, the Army's Chief of Engineers and former North Pacific Division Engineer, did not believe power alone sufficient justification. Ignoring District and Division recommendations, he omitted Asotin from the Corps' list of projects awaiting Congressional authorization. "The dam looks promising as a power producer," he wrote, "but the navigation benefits do not appear to be sufficiently assured to warrant authorization." Some day navigation potential might improve. Until then, Itschner would not recommend an Asotin Dam. [3]

The IEWA rallied a lobbying effort. Herbert West viewed Itschner's action as a setback, not total defeat. "The Chief of Engineers, in effect, has said, 'not now, but come back . . . and let's take another look'," he wrote IEWA members. "We will win this fight as we have others. This is only a slight delay." West and the IEWA would be victorious in the short–term battle at Asotin by waging an intensive campaign for authorization, but they would lose the long–term war. [4]

The IEWA encouraged politicians to speak out for a dam at Asotin. Idaho Governor Robert Smylie did, becoming one of the Chief of Engineers' most outspoken critics, strongly encouraging a dam. The IEWA, meanwhile, hired an engineering company to re-figure the Corps' economic data. The Seattle firm of Thomas and Harstad found $405,000 more annual navigation benefits than had the Corps, bringing Asotin Dam's benefit-to-cost ratio to 1.72 to 1, a more favorable margin than eight Columbia Basin projects Itschner had previously approved. [5]

The new figures placed the Chief in an awkward public relations position, demonstrating that he had recommended a number of dams with apparently less economic justification. The Chief's office reconsidered, and in 1962, recommended Asotin for Congressional authorization. Once again, the IEWA and its allies lobbied hard. At the height of national interest in the space race, the Port of Clarkston colorfully urged Congressional approval in the popular jargon of the day: "The Asotin project . . . will lift this whole Whitman County, Garfield County, Lewiston–Clarkston area into orbit. . . . Our economic rocket will soar the very minute Congress approves the Asotin Dam." Without any serious opposition to the project, Congress authorized it. [6]



Proposed alignment of dam at Asotin.

The Corps remained skeptical about the dam's navigation benefits despite the IEWA engineering firm's rosy forecast. As a result, debate on whether to include navigation locks raged, delaying a possible early construction start and allowing forces opposed to any additional Snake River dams to gain strength.

Although the Chief of Engineers eventually agreed to recommend Asotin, his office continued to differ with the Walla Walla District and North Pacific Division over the dam. The regional offices recommended Asotin include navigation locks; the Chief of Engineers disagreed. The locks' overwhelming use would provide access to rich limestone deposits at a Snake River site known as Lime Hill or Lime Point. In rejecting the proposed locks the Chief wrote, "At this time, the uses of limestone from this source . . . and the savings in transportation costs, are not sufficient, in my opinion, to warrant the inclusion of a lock for barge navigation." [7]

The IEWA, port districts, and other dam advocates immediately protested the decision, and found strong allies in Idaho's Senator Frank Church and Representative Compton White, Jr. In 1963, the Senate passed a resolution requesting the Chief to review his ruling concerning locks. The Chief ordered the Walla Walla District to reinvestigate.

The difficulty for those advocating locks was the Chief of Engineer's reluctance to recommend this feature for a single purpose, and there were few other reasons to include locks at Asotin other than to transport limestone downstream. The Walla Walla District knew it would be difficult to change the Chief's opinion unless it found other reasons to justify locks. It asked local groups to help uncover additional uses. Walla Walla District Engineer Colonel Frank McElwee sent letters to port districts and development organizations encouraging them to gather data on other products available for shipping and to forecast how waterside industries might benefit as a result of slackwater navigation. [8]

Lock advocates tried hard, but with limited success. In a report to the Corps, the Port of Clarkston found that some wheat would find a market if slackwater went further up the Snake, and predicted that shippers also would haul timber products. In the end, however, eleven of the report's thirteen pages centered on limestone.

Congressman White suggested that locks would encourage industrial development. Senators Warren Magnuson and Frank Church responded that "dramatic changes in the region's economy since the original design of the dam for power only will justify inclusion of a navigation lock in the interest of both human and natural resources." But these were vague allusions to what might happen. In the final analysis, lock advocates uncovered no valid reason to justify navigation other than to gain access to lime. [9]

The Walla Walla District simultaneously undertook its own studies, and it, too, uncovered no other legitimate reason for locks. The Forest Service rebutted the Port of Clarkston, stating barge transportation would not benefit lumber products. Although some wheat was available for shipping, there was not enough to justify expensive locks. To make matters worse, economic justification for single–purpose "lime" locks worsened as the years wore on.

In 1960, two major Pacific Northwest cement companies indicated an interest in Asotin's limestone. When Congress authorized the dam without locks, however, both companies found better and cheaper deposits elsewhere, and by the mid–1960s, no major Northwest firm expressed an interest in Lime Point's material. The Pasco region could use some of the mineral, but Walla Walla believed "the savings in transportation costs of limestone to the Pasco area . . . are not sufficient to justify the inclusion of a lock." The District projected that Lewiston would eventually require a large cement plant that could use the limestone, but not until 2005. It would be cheaper to build the dam without locks and add them later than to allow them to sit idle in the interim. Despite a unanimous expression of support for locks at a Lewiston public hearing in 1965, the District changed its 1962 opinion and recommended that the dam have no navigation facilities. When all the studying and debating subsided it was 1967, and by then, although the Corps did not yet know it, the question of whether or not to build locks had become almost moot. Forces that would eventually defeat the proposal to build any dam, with locks or not, stood ready to take the offensive. [10]

Dam opponents fired their opening salvos over the merits of slackwater recreation, a relatively minor benefit of the proposed Asotin Dam. The Corps of Engineers had not always recognized the importance of recreation. "Around our first reservoirs we treated recreation as a nuisance to be avoided, then we reluctantly tolerated it, then allowed minimum development provided someone else would pay for it," testified Brigadier General Drake Wilson, the Corps' Deputy Director of Civil Works in 1977. But as leisure time increased and people became more interested in water sports and outings to lakes, reservoirs and rivers, Congress provided a significant incentive for the Corps to augment its recreational program. [11]

In 1932, Congress extended the Corps' authority to consider recreational boating when planning navigational improvements. The Flood Control Act of 1944 recognized recreation as a legitimate function of federal water projects. But these measures merely permitted the Corps to develop recreation facilities; they were not mandatory. Even more important, the Corps could not include monetary benefits produced by recreation when determining a project's economic feasibility. The Engineers still had little motive to build recreational sites. But in 1964, Congress passed the Federal Water Project Recreation Act (WPRA), which allowed the Corps and other agencies to calculate recreational benefits when determining project economics. This act provided the incentive the Corps needed. Now recreational development could partially justify the construction of marginal multipurpose projects by tipping the benefit–to–cost ratio in favor of construction. [12]

Many conservationists viewed passage of WPRA as a victory enabling the nation's largest dam builder to give serious consideration to recreation potential at its reservoirs. But some environmentalists came to abhor the act, as the Corps used recreation to help justify dam and waterway construction. Every Corps project faces the fundamental issue of whether developed recreational facilities are better than natural ones. On one hand, development provides greater access. There is no question that, in the vast majority of cases, more recreationists use reservoirs than the free-flowing rivers they replace. But any agency that alters nature is bound to anger some people. The values the American people attach to wilderness have steadily changed from the days when their ancestors first cleared the eastern forests, stated the President's Council on Recreation and Natural Beauty in 1968. "Wilderness in overwhelming abundance is an entirely different matter from wilderness grown scarce. That which is scarce is valued highly." [13]

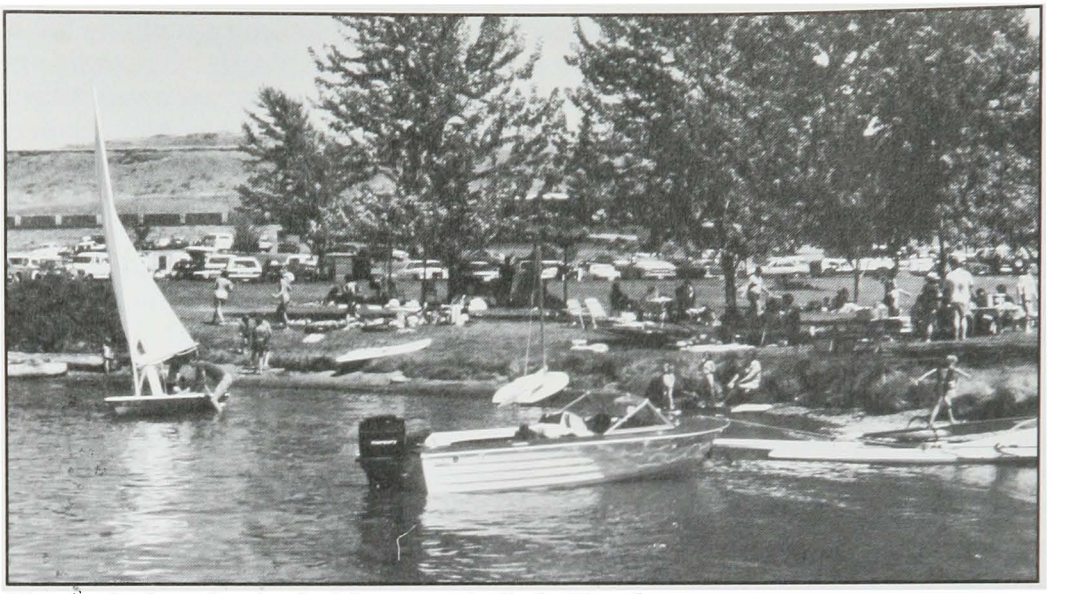
As the number of free-flowing rivers decreased, public demand to preserve remaining ones grew. When a dam creates slackwater, the very nature of recreation changes. Water skiers replace whitewater canoers. Families driving on access roads replace hikers with backpacks. Stream fishermen give way to reservoir anglers. By the 1960s, virtually every major natural area boasted advocates desiring to see it remain unaltered, and the debate over development became increasingly heated. In no place was that debate hotter than along the undammed portion of the Snake River.

The Corps of Engineers estimated that Asotin would derive 99 percent of its benefits from electricity and less than one percent from recreation, but the small portion attributed to recreational benefits spurred dissension. Those who supported the dam, partially because of its recreational advantages, argued from a different set of values than those who opposed the structure.

"The recreational potential of the Asotin reservoir is striking," noted a consulting group the Lower Snake River Ports Association hired. "It will be possible to travel by pleasure craft on slack water to the lower end of the Grand Canyon of the Snake River . . . and to the mouth of the . . . famous 'River of No Return.' Here, in some of the most primitive and spectacular scenery in the country it is possible . . . to hunt deer at dawn, Chinese pheasants and quail in the morning, and to fish for steelhead . . . in the afternoon. . . with a good chance of success in all three." [14]

The Sierra Club, which led the fight against Asotin in the 1960s, dissented. A reservoir would ruin a great scenic treasure. "We believe that quality of recreation also is an important consideration," countered the Club's Brock Evans. "In the particular case [of] that part of the Snake River to be impounded by the Asotin Dam, it may be that the type of experience of traveling up or down a great living river is a higher type of . . . experience than that offered by one of many similar reservoirs which already exist on both the Snake and Columbia Rivers." [15]

The Corps of Engineers differed with the Sierra Club. It maintained that more people--particularly family boaters--would use the reservoir than the free-flowing stream it replaced. Additionally, since Asotin would flood only 26 miles of the Snake, "there would still be many miles of open river available to the adventurous boater," noted Major Harold Matthias, the Walla Walla District's acting District Engineer in 1969. His predecessor, District Engineer Colonel Robert Giesen, had shared that sentiment. "In the development of any water resource project, it is realized that some of the natural beauty of a free-flowing intermountain river is lost, particularly for those who revere this type of stream," Giesen wrote Senator Warren Magnuson in 1967. "Creation of a long narrow lake in the Snake River canyon makes possible other types of recreation . . . at the same time creating a beauty of a different variety which we feel offsets the losses. Our experience has been that the Columbia and Snake River dams with stable pools have created very scenic and beautiful bodies of water. These reservoirs are utilized heavily by many more people than would have been able to enjoy the streams in their natural state." [16]



Thousands of people enjoy the lakes creates by Snake River dams.

The Corps estimated 10,000 visitors annually used that part of the river to be flooded, but 30,000 would use it once the dam created slackwater. When a 1973 Washington Department of Game study showed 65,000 man–days of usage annually along the free–flowing river, or more than twice the number the Corps estimated for reservoir use, the Corps lost a significant argument in its arsenal: the Asotin Dam would not increase recreational benefits. But, by then, the issue had become irrelevant because forces opposed to the dam had gained considerable strength. Led by the Sierra Club, public opinion had shifted dramatically. Brock Evans described the Club's involvement in spearheading this change in attitude:

> *For about three years' running (1967–69), I would get word from our people in Washington, D.C. that the Corps of Engineers was making another request for more study funds for this boondoggle of a project. I would immediately get out an alert, burn up the wires to our people in Lewiston and Clarkston, and to some of the sportsmen around the state, and would pour in a flood of mail to Senator Church and the Washington State delegation, urging that funds be deleted.*
>
> *These pressure tactics worked, every year for three years. . . . Gradually over the years we were able to build a backfire of local sentiment against the project.* [17]

By 1969, numerous individuals, institutions, and organizations had joined the Sierra Club in opposing Asotin. The *Lewiston Morning Tribune* recapped the changing times:

> *The joy with which this area greeted congressional authorization of the proposed Asotin Dam––just seven years ago today––is recalled by most of us now as extremely simplistic. . . . In the years since 1962 we have become less sure than we were then of the invulnerability of our environment and less inclined to alter it for alteration's sake. . . . It used to be that our grandchildren would thank us for building that dam; now they will thank us if we don't, more than likely, and we know it.* [18]

In a series of stinging editorials against the Corps' request for Asotin study funds in 1969, the *Tribune* argued against appropriating any money for the dam. "We don't think a dime should be spent on this project until somebody other than the prospective builder has found good reason for building it," the newspaper opined. Other papers, most significantly the influential Portland *Oregonian*, also opposed Congressional appropriations. [19]

The Pacific Marine Fisheries Commission passed a resolution urging Congress to refuse funding for Asotin. Others joined in, including the Idaho Wildlife Federation, the Idaho Department of Fish and Game, the Fish and Game Committee of the Lewiston Chamber of Commerce, the Asotin Wheelers, the Washington Department of Fisheries, and the Hells Canyon Preservation Council. The organizations worried about loss of another stretch of natural river and about potential harm to anadromous fish. They questioned whether the Northwest needed additional power and debated the merits of Corps' findings that a reservoir would increase recreational use. [20]

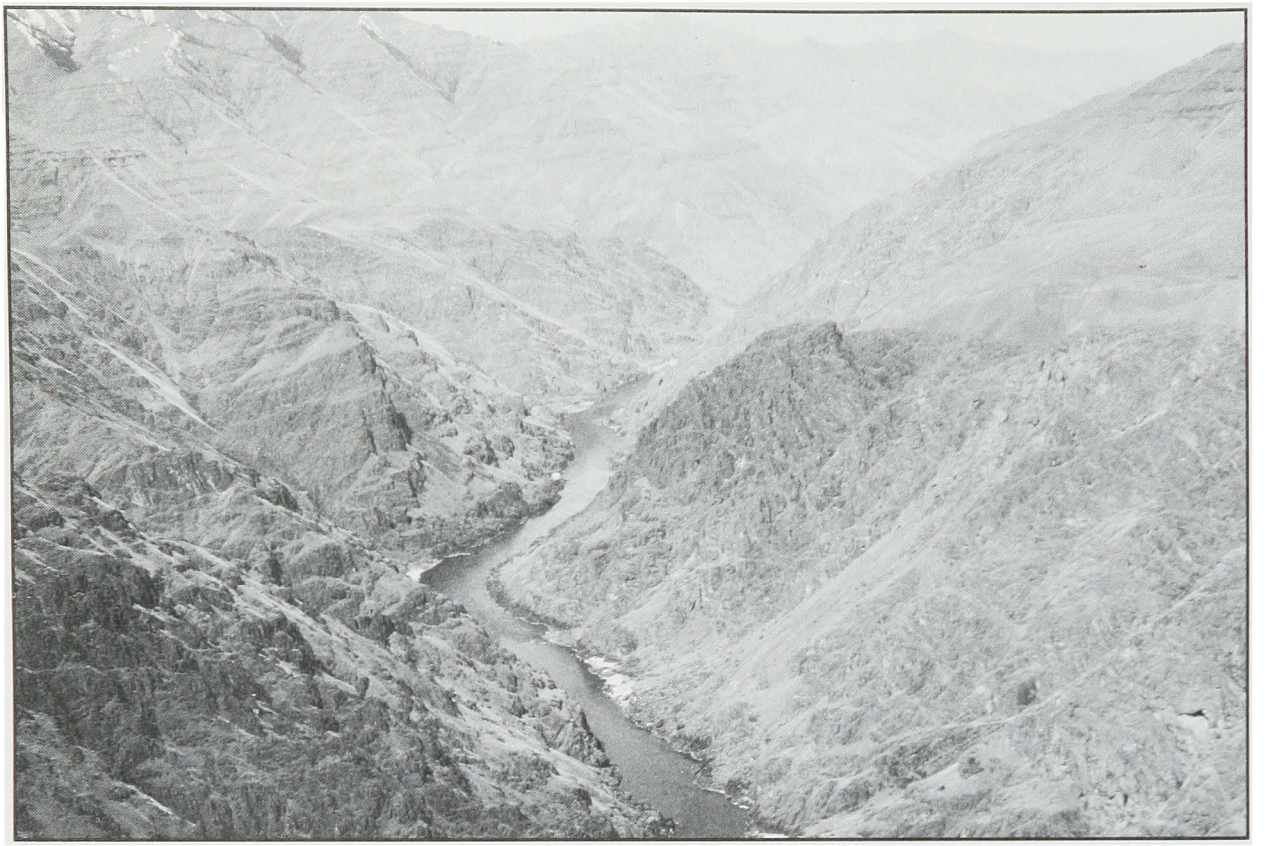
The Corps attempted to stem the groundswell by pointing out projections of upcoming critical energy needs. "The Bonneville Power Administration [predicts] . . . a major resource deficit of 780,000 kw in the 1974–75 power year with increasing deficits in the following years . . . to the point that by 1978 this region is faced with a 3,000,000 kw deficit," the North Pacific Division informed the Chief of Engineers. "Asotin should come on the line at the earliest possible time." [21]

When the Corps asked Congress for a $75,000 appropriation to study the Asotin project in 1969, the IEWA, as usual, supported the proposal. But this time things were different. This time dam opponents flooded Congress with mail. As a result of this outpouring, and at Idaho Senator Frank Church's appeal, the Corps dropped its request for planning funds. [22]

The correspondence and resolutions and editorials did not sway Senator Warren Magnuson, that stalwart advocate of Snake River development. As late as 1972, when most Congressional representatives had long since given up on Asotin in an effort to appease a majority of their constituents, Magnuson continued to support the dam, stating the Northwest faced a blackout if the region did not construct such power–producing facilities. But, for the first time on the lower Snake, Magnuson faced serious opposition by an equally powerful Northwest Senator, Idaho's Frank Church, who had been a staunch Magnuson ally in supporting the other four Corps projects downstream. [23]

Frank Church became a champion of environmentalists in the 1970s. But he had not always opposed damming the Snake. As a junior Senator, he even endorsed a controversial dam in Hells Canyon, an area long revered by naturalists. "A high dam at Hells Canyon," he said in 1957, "would prove a great stimulant to the entire Northwest. It would bring to Idaho, in generous measure, benefits of the kind that have enriched our neighboring states from such mighty government dams as Grand Coulee, Bonneville, Shasta and Hoover. . . . This we owe, not only to ourselves, but to our children and our grandchildren." Throughout the 1950s and 1960s, he vigorously supported the four dams of the lower Snake project, even when environmentalists opposed Lower Granite. And he had pushed hard for Asotin authorization in 1962. [24]

By the late 1960s, however, Frank Church began to question the wisdom of further dams along the Snake, particularly those threatening the pristine beauty of Hells Canyon. Church spearheaded a drive that would permanently prohibit dam building in the nation's deepest gorge and lead to Congressional deauthorization of the Asotin project.



Hells Canyon

Few stretches of American rivers have been as much debated as the middle Snake. For decades people argued about whether this reach of water should be dammed, and if so, by whom. [25]

In the 1940s and 1950s, the controversy centered on who would build dams, not whether they should be constructed. It was perhaps the nation's most publicized battle between private and public power concerns. Both the Corps of Engineers and the Bureau of Reclamation made surveys of potential dam sites in Hells Canyon, dams that could produce enormous amounts of public electricity. Fishery agencies did not loudly protest these dams in the 1940s and 1950s. They concentrated on battling Ice Harbor, a project they viewed as much more destructive to fish runs than obstructions above the confluence of the Salmon and Snake. Indeed, many fisheries people endorsed Hells Canyon dams as better hydropower alternatives to those that blocked the lower river.

The real villain for public power advocates was not conservationists but President Dwight Eisenhower and his "no new starts" policy for federal hydroelectric projects. In 1955, the Federal Power Commission, after extended hearings over the merits of both private and public power, sided with private interests and granted the Idaho Power Company a permit to construct three middle Snake dams, Brownlee, Oxbow, and lower Hells Canyon. Frustrated public power advocates won United States Senate approval to construct a high dam that would flood the three Idaho Power sites. But the House of Representatives rejected the proposal, and Idaho Power's first dam went on line in 1958.

The lower, and most dramatic, part of Hells Canyon remained undammed in the 1950s, primarily because of squabbling over who should build a structure there. Four private firms proposed to construct a high dam at one site, while the Washington Public Power Supply System sought to build an even higher dam a short distance away. The Corps of Engineers also made preliminary plans for a series of dams from Lower Granite all the way to the Idaho Power Company's most downstream project. The Corps' plans frequently clashed with those of the Bureau of Reclamation, which had even more specific proposals to dam this stretch of the river. Indeed, Hells Canyon was a dam-builder's dream, a treasure-trove of hydropower potential. Virtually every private and public dam-building concern active in the Pacific Northwest wanted to construct something there. The long, complicated, and heated debate raged through the late 1950s and 1960s. Eventually, the focus began to shift from who should build to whether this scenic gorge should be dammed at all.

In 1964, the Federal Power Commission granted permission to the four private firms to construct a high dam. But public utilities and conservation groups appealed the ruling, and eventually the United States Supreme Court heard the case. Overruling the Commission in 1967, the Court ordered the Commission to hear evidence concerning the possible advantages of public development. By this time, however, the nature of the debate had shifted. Environmental groups had taken stands adamantly opposing any development along the middle Snake, and even the Department of the Interior, whose Bureau of Reclamation had long desired to build there, began reconsidering the wisdom of obstructing this stretch of wild water.

Located precisely where many people believed the "lower" Snake ended and the "middle" Snake began, protagonists largely left Asotin out of the early controversy surrounding Hells Canyon. But in the late 1960s, dam opponents began including Asotin with other "middle" Snake dams they considered of dubious merit. Less and less did they view it as an inevitable extension of the four-dam "lower" Snake River project.

In the late 1960s, two unusual political bedfellows combined to help preserve the middle Snake. Idaho's Democratic Senator Frank Church, by the late 1960s, wanted no dams of any type in Hells Canyon. Idaho's Republican Senator Len Jordan formerly lived along the middle Snake and had attachments to the place. Even so, environmentalists suspected his intentions when he sought a dam-building moratorium. In 1954, as Idaho's governor, he had favored federal construction in Hells Canyon, as long as these power-producing monoliths did not interfere with southern Idaho's future irrigation demands. In the late 1960s, environmental activist Annette Tussing, after interviewing Jordan, claimed he had really not changed his mind. He opposed federal dams not because of the canyon's scenic wonders, but because he continued to fear a federal power dam might divert water needed to irrigate southern Idaho. "There are many sources of power," he stated in 1971, "but the one essential element in making the desert bloom is water." Regardless of his motives, Jordan joined with Church to advocate a temporary halt to all dam construction along the middle portion of the river. Their combined efforts, which stalled dam building, helped to preserve the middle Snake and doomed the Asotin project. [26]

Church and Jordan, in 1968, proposed a "ten-year moratorium on any further dam building between the Hell's Canyon [Idaho Power Company] project and the Asotin site, in order to keep Idaho's water options open pending further study on use." The United States Senate held lengthy hearings over the issue, pitting developers against environmentalists in a classic debate that lasted years. In session after session, Congress refused to approve the moratorium. But in session after session Jordan and Church re-introduced the legislation, successfully postponing everyone's dam-building plans. [27]

In 1973, Republican James McClure replaced Jordan. Working with Church, Idaho's governor Cecil Andrus, and other Northwest politicians, McClure advocated an even more comprehensive proposal to halt dam construction. Now, the Idaho Senators fought for a Hells Canyon National Recreation Area (NRA) prohibiting dam building by anyone along the middle Snake. Environmentalists supported the NRA; public and private power interests opposed it. By 1974, it appeared Church and McClure had enough support to pass the legislation, and the Senate approved it. But Idaho's Representative Steve Symms led stiff opposition to the bill in the House, and it died in committee. Finally, in 1975, despite intense lobbying from developers, Congress created the Hells Canyon National Recreation Area. President Gerald Ford signed the act into law. As Frank Church, the man who had supported many dams elsewhere, noted during NRA dedication ceremonies: "I think that as we look ahead in this age when we display such arrogant pride in man's work, it is a welcome thing, once in a while, to celebrate the preservation of God's work." [28]

Throughout the long debates over the moratorium and NRA, developers and preservationists argued about including the Asotin Dam in restrictive legislation. The original Church and Jordan moratorium had sought to temporarily halt dam construction between the Idaho Power Company's last dam and Asotin. Many people, including the Corps of Engineers, believed such language allowed construction at Asotin. Indeed, the two sponsoring Senators of that 1960s proposal differed over whether their moratorium affected this dam site. Frank Church clearly expected the resolution would also delay construction at Asotin. Although the dam site itself technically lay outside moratorium boundaries, Church argued that "the proposed Asotin Dam would back water for 26 miles into part of the stretch of the river which the moratorium bill would protect." Clearly, he did not want the Corps to build Asotin, at least for ten years. Jordan, on the other hand, did not want Asotin included in the moratorium, and intended the Corps to carry on necessary plans and eventually begin construction, even if Congress passed the moratorium resolution. [29]

Differences also existed within the Nixon Administration concerning whether or not to include Asotin. The Interior Department testified in favor of the moratorium, but when Washington Congresswoman Catherine May questioned whether it opposed a Corps dam at Asotin, the agency attempted to find a way to support both a moratorium and Corps construction. They discovered that the moratorium prohibited only the Federal Power Commission from licensing projects on the middle Snake. Since the Federal Power Commission did not license Corps dams, Asotin would be unaffected. When May's staff asked specifically if they would change their testimony should it become apparent the moratorium did pertain to Asotin, Assistant Secretary of the Interior James Smith replied, "You'd better believe it!" [30]

Once Congress began debating the Hells Canyon NRA rather than the moratorium, however, there was no question that Asotin lay outside its protective boundaries. That worried many environmentalists who wanted all the undammed part of the river, not just the section through Hells Canyon, to remain free–flowing. In 1971, the House Public Works Committee inadvertently authorized the Corps to expend $500,000 at Asotin. That brought the project, until then largely ignored in the NRA deliberations, clearly into the spotlight. A perplexed Oregon Senator Bob Packwood wrote to the Corps following the House action, "I am sure I do not have to bring to your attention the degree of public concern about this project." He wondered how it was that the Corps justified seeking funding in the midst of so much controversy over the future of the middle Snake. [31]

Actually, the Corps was blameless. Earlier in the year, Congress asked the agency how much it could spend at Asotin in the near future should Congress authorize the money. The Corps responded with the $500,000 figure. The House committee then included that amount as a tiny part of a huge omnibus public works measure and the proposal slipped by Northwest Congressional observers. As an embarrassed Washington Congressman Mike McCormack, a member of the House Public Works Committee, stated, "Had I known this was in it I would have raised questions and asked for a delay by the committee." The Corps reassured Northwest politicians it had no intention to begin work at Asotin without the obvious approval of Congress. But this episode helped focus attention on the dam. [32]

Within a few months, the Corps informed Senator Jordan that since "plans for the ultimate development of the Snake River are still highly controversial and subject to great change," it had decided to move Asotin from its list of "active" projects to "deferred" status, motivated to some extent by concerns over fish problems then surfacing at dams already constructed along the lower Snake. That did not satisfy environmentalists who wanted the dam deauthorized to prevent future efforts to rally support for a Corps–built dam. And by then, Asotin had few friends in Congress. In 1973, Idaho Representative Steve Symms, a vigorous opponent of the Hells Canyon National Recreation Area, nonetheless introduced legislation to deauthorize Asotin. "No matter which way you turn, there is very little justification for building Asotin Dam," he stated. But while it willingly moved the dam to deferred status, the Corps' Walla Walla District refused to recommend its deauthorization. The Washington Public Power Supply System, an association of public utility districts, also continued lobbying diligently for construction. As a result of the Corps' unwillingness to recommend deauthorization, and because influential groups still supported the project, Church and McClure sought to permanently end debate over a federal dam at Asotin. Although the Hells Canyon National Recreation Area did not extend to the site, the final version of the bill specifically prohibited the Corps from building there. Congress at last deauthorized Asotin, thirteen years after it approved it. Other than a little core drilling to find a suitable damsite, the Corps had done no work. Yet it had been one of the most controversial proposals within the Walla Walla District. [33]

For a number of years, some development groups, particularly the IEWA, now renamed the Pacific Northwest Waterways Association (PNWA), hoped to persuade Congress to reauthorize Asotin. John Tuttle of the PNWA claimed in 1979 that Asotin was "inadvertently deauthorized" as part of the legislation creating the Hells Canyon National Recreation Area. But Tuttle was wrong. Congress's action was not 'inadvertent' or ambiguous. After years of contention, it wanted to be sure the Corps never constructed a dam at Asotin. It considered deauthorization final and never seriously considered reauthorizing the project. [34]

But, to many environmentalists Asotin seemed a dam that refused to die. The NRA prohibited the Corps from building there, but it did not stop private interests. Asotin did not have the same protection from dam building as did property within the NRA boundaries. The federal government could still permit a private dam. Throughout the 1970s and 1980s, the issue of whether or not to construct a dam at Asotin continued to rise.

In 1977, Washington Governor Dixie Lee Ray stated she hoped to see a power–producing dam at Asotin. Two years later, 17 Pacific Northwest electric cooperatives sought a Federal Energy Regulatory Commission (FERC) permit to investigate the feasibility of an Asotin Dam. At the instigation of environmentalists who hoped to kill all Asotin dams once and for all, the Bureau of Outdoor Recreation (BOR) in 1977 began a study to determine the feasibility of adding 35 miles of the Snake River to the nation's Wild and Scenic Rivers System, a segment specifically including the Asotin dam site. [35]

The BOR requested the Walla Walla District to participate in the study, and the Corps reluctantly agreed. The District knew that most of those favoring wild and scenic status did so because it would prohibit construction at Asotin. Paul Fredericks, the District's representative to the study group, recommended that the Corps' involvement in the study "be limited to providing input on benefits foregone and impacts on our currently authorized activities." The District clearly did not care to be seen as attempting to prevent wild river designation, because "we will be in the minority and be accused of trying to keep the Asotin project alive." [36]

Officially maintaining a neutral position, the District did note that failure to construct the dam would result in an estimated power loss of $23 million annually and that large deposits of limestone would remain inaccessible. Although the BOR recommended that the reach be included in the Wild Rivers System, the Department of the Interior advised against inclusion; and Congress refused to pass such legislation. Those desiring a dam still had an opening. [37]

The controversy at Asotin arose once again in 1988 when a private firm, Asotin Hydro Company, a subsidiary of Consolidated Hydro of Greenwich, Connecticut, requested a preliminary FERC permit to study a 200-foot-high dam backing a reservoir 26 miles long. Negative reaction came swiftly.

The dam "would generate electricity the region doesn't need and make money for stockholders who have never seen the river," editorialized the Moscow *Idahonian*. A wide variety of groups formally opposed the permit, ranging from environmental organizations to jetboaters, outfitters, city councils, and county commissions. [38]

The Asotin County Public Utilities Commission seemed the only regional organization wavering about dam construction, a considerable difference from the 1950s and 1960s when developers spoke out boldly in favor of Asotin. But even the public utilities' advocacy was muted. It filed a counter proposal with FERC to study an Asotin dam proposal, and did believe the Northwest had legitimate power needs. But the Asotin public utility had long opposed an Asotin Dam. It filed its proposal primarily to block other entities from building in its back yard. Under federal regulations, public agencies had first permit priority even if they filed after a private corporation, and the first public agency seeking a permit held priority over all other public organizations. The Asotin public utility took its stance primarily because it wanted assurance that if anyone built at Asotin, it would be the one, not a private out-of-state company. [39]

The Walla Walla District played a minor role in the 1980s Asotin controversy, since its dam remained deauthorized. However, when representatives of the Connecticut firm visited the agency, the Corps did express some interest in the project. "In addition to power benefits that would be derived," the District wrote, "a dam at Asotin would be very effective in reducing the large sediment load that is being deposited in Lower Granite Reservoir," thus alleviating some of the need for expensive dredging downstream. [40]

The two permit requests, coming after a long lull at Asotin, awoke those opposed to dams on the Snake, particularly Idaho Senator McClure. He introduced legislation prohibiting FERC from licensing any dams from Asotin to the NRA boundary. In November 1988, President Ronald Reagan signed the bill into law. The legislation closed the last loophole at Asotin. The federal government could not build there, nor could it license a private or public dam. Environmentalists had won a significant, long, and hard-fought battle to prevent damming upstream from Lower Granite. [41]

Had the Corps of Engineers in the 1930s chosen its boundary between the "lower" and "upper" Snake at a spot upstream from Asotin, there would likely today be five dams along the lower portion of the river. Had Congress authorized Asotin as part of the "lower" Snake River project in the 1940s, planning would have probably progressed too far by the late 1960s to defeat the project. But Congress did not authorize the dam until 1962, the same year Rachel Carson wrote *Silent Spring* and launched the modern environmental era. The nation's attitude towards dam building shifted rapidly. Environmentalists fought the Corps at Lower Granite. But Lower Granite was the last unit in a long–contemplated, multi–dam project, and environmentalists never seriously threatened that structure. The Asotin story ended differently. Beginning later, it never really had a chance of being built.

In the period between 1948, when the Corps created the Walla Walla District to construct the lower Snake dams, and 1988, when President Reagan signed legislation prohibiting dam–building at Asotin, the District underwent dramatic alterations. Its major dam–building era ended with Lower Granite. Small construction projects continued, but the Walla Walla District shifted from constructing to managing projects already built.

Endnotes

[1] U.S. Congress, *Snake River and Tributaries*, 73d Cong., 2d Sess., 1934, H. Doc. 190, esp. pp. 20–1.

[2] For the 1950s plans, see *Public Hearing, Review Report on Columbia River and Tributaries, Boise, Idaho*, 12 Jy. 1956 (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District), pp. 12–13.

[3] Itschner's arguments against the Asotin Dam are summarized in *The Log,* 12:1 (Jan. 1960), and 12:4 (Apr. 1960). The quotation is in the latter.

[4] *The Log*, 12:1 (Jan. 1960).

[5] For Smylie, see Smylie to Itschner, 30 Aug. 1960, box 23, Smylie papers. For good background on IEWA lobbying and the Thomas and Harstad report, see *Lewiston Morning Tribune*, 24 Apr. 1960.

[6] Emmett Johnson, President, Port of Clarkston to Sens. Warren Magnuson and Henry Jackson and Rep. Catherine May, 13 Feb. 1962, RG 77, Acc. #T77–85–0022, WWD files, box 24, Seattle FRC.

[7] The quotation is repeated in Walla Walla District Engineer Col. Frank McElwee to E.V. Lorenz, President, Lower Snake River Port Assn., 29 Jan. 1965, RG 77, Acc. #T77–85–0022, WWD files, box 24, Seattle FRC.

[8] Ibid.; McElwee, "Notice of Public Hearing in Lewiston on 24 Mar. 1965," box 124, NPPA.

[9] Port of Clarkston, "Economic Factors Bearing Upon the Question of: Asotin Dam Construction with Locks," n.d. (1965?), box 130, May papers; White to McElwee, 19 Mar. 1965, box 2, White papers; Magnuson and Church telegram read at Lewiston public meeting on Asotin locks, quoted in *Tri–Cities Herald*, 25 Mar. 1965.

[10] For the District study, see Walla Walla District Engineer Col. Robert Giesen, "Asotin Lock Study," memorandum to Division Engineer, 15 Sept. 1967, RG 77, Acc. #T77–85–0022, WWD Files, box 24, Seattle FRC; and "Asotin Lock Study: Summary of Report," n.d., cabinet VII, drawer 4, "Asotin Lock and Dam––Misc." file, IEWA. For unanimous support at the Lewiston public meeting, see *Tri–Cities Herald*, 25 Mar. 1965. For additional background, see *Lewiston Morning Tribune*, 24 Apr. 1960.

[11] The quotation is in U.S. Congress, *Hearings Before the Subcommittee on Parks and Recreation of the United States Senate Committee on Energy and Natural Resources: Outdoor Recreation Briefing*, 95th Cong., 1st Sess., 1977, p. 124.

[12] Two books give a basic summary of the gradual evolution of the Corps in recreational activities. See Clayne R. Jensen, *Outdoor Recreation in America: Trends, Problems, and Opportunities* (Minneapolis: Burgess Publishing Co., 1973), pp. 70–75; and Philip O. Foss, *Conservation in the United States, A Documentary History: Recreation* (New York: Chelsea House Publishers, 1971), pp. 418–60. Also see *The Third Nationwide Outdoor Recreation Plan* (Washington, D.C.: Heritage Conservation and Recreation Service, 1979), appendix III, pp. 112, 119; and William J. Hart, "Corps Lands: Is Anybody Minding the Store?" *National Parks and Recreation Magazine,* (Jan. 1980), pp. 16–19.

[13] *From Sea to Shining Sea: A Report on the American Environment––Our Natural Heritage* (Washington, D.C.: President's Council on Recreation and Natural Beauty, 1968), p. 196.

[14] Bovey Engineers, Inc., "Traffic Projections for Asotin Pool, Lower Snake River," Mar. 1965, p. 17, box 2, White papers.

[15] Evans to Sen. Warren Magnuson, 6 Dec. 1967, Acc. #2048 1776–1–6, box 25, Brock Evans papers.

[16] For Matthias, see *Lewiston Morning Tribune*, 11 Dec. 1969. For the other quotation, see Giesen to Magnuson, 17 Oct. 1967, RG 77, Acc. #T77–85–0022, WWD files, box 24, Seattle FRC.

[17] For the 1973 study, see *Spokane Daily Chronicle*, 31 Jan. 1973. The Evans quotation is in "Memo from Brock Evans to Snake River–Asotin Dam" file, 25 Jan. 1973, Acc. #2048 1776–1–6, box 25, Brock Evans papers.

[18] *Lewiston Morning Tribune*, edit., 13 Oct. 1969.

[19] The quotation is in *Lewiston Morning Tribune*, edit., 13 Mar. 1969. Also, see the paper's editorials of 25 Feb. 1969, 13 Apr. 1969, and 16 Apr. 1969. The Portland *Oregonian* editorial appeared on 23 Mar. 1969.

[20] Resolutions and clippings about various groups opposing appropriations for Asotin in 1969 can be found in box 339, May papers. Also see *Spokane Daily Chronicle*, 19 Dec. 1969; and Thor Tollefson, Director, Washington Department of Fisheries to Stanley Resor, Sec. of the Army, 1 Apr. 1969, Acc. #3560–4, box 84, Jackson papers.

[21] Deputy North Pacific Division Engineer Col. C.A. Carroll to Chief of Engineers, 29 Je. 1967, box 24. Also, see Walla Walla District draft response to Sen. Warren Magnuson, Nov. 1969, box 16. Both in RG 77, Acc. #T77–85–0022, WWD files, Seattle FRC.

[22] For samples of opposition mail, see Acc. #3560–4, box 84, Jackson papers; and box 339, May papers. For Church's role in getting the Corps to drop its request, see Church to George Nimmo, 24 Je. 1969, series 3.3.3, box 49, Church papers; and *Lewiston Morning Tribune*, edit., 16 Apr. 1969.

[23] For Magnuson's suggestion that Asotin be reconsidered, see *Lewiston Morning Tribune*, 26 Oct. 1972.

[24] The quotation is in *Lewiston Morning Tribune*, 13 Jan. 1957. Also, see Boise *Idaho Statesman*, 15 Feb. 1957. For some typical Church replies to environmentalists who unsuccessfully attempted to persuade him to oppose Lower Granite, see Church to Christopher Kilmer, 10 Nov. 1971; Church to Mort Brigham, 3 Dec. 1971; and Church to Donald Thomas, 3 Je. 1971. All in series 3.3.3, box 49, Church papers.

[25] Despite its significance as one of the longest battles between public and private power advocates, as well as between developers and conservationists, historians have given the long and complicated struggle over damming the middle Snake scant attention. For summaries of various parts of the story, see Robert D. Tininenko, "Middle Snake River Development: The Controversy Over Hells Canyon, 1947–55" (unpublished Masters thesis, Washington State University, 1967); Charles McKinley, *Uncle Sam in the Pacific Northwest*; and Gulick, Snake River Country, pp. 167–81.

[26] See Jordan to Maj. Gen. I.D. Sturgis, Jr., Chief of Engineers, 1 Jy. 1954, box 5, Smylie papers; Tussing, "Private Citizen Still Can Make His Voice Heard in the Capital," *Lewiston Morning Tribune*, 1 Mar. 1970; and "Statement of Senator Len Jordan, Introduction of a Bill Relating to a Moratorium for Dams on the Middle Snake River," 1 Feb. 1971, series 7.9, box 14, Church papers. Jordan's wife, Grace, wrote a moving account of their life on the river. See *Home Below Hell's Canyon* (New York: Thomas Y. Crowell Co., 1954).

[27] See series 7.9, box 14, Church papers for the long efforts of the Idaho Senators to pass a middle Snake moratorium.

[28] *Lewiston Morning Tribune*, 2 Jan. 1976; 3 Jan. 1976; 21 Je. 1976 (quotation). Seattle *Daily Journal of Commerce*, 3 Jan. 1976.

[29] For the quotation, see Church to Sen. Richard Russell, 3 Apr. 1969, series 3.3.3, box 49, Church papers. For Jordan's differing viewpoint about Asotin, see John Knievel, Catherine May's administrative assistant, memo to May, 25 Feb. 1970, box 396, May papers.

[30] The quotation and details on the behind-the-scenes debate over whether Asotin would or would not be impacted by the moratorium can be found in a series of 1970 inter-office memos in box 396, May papers. Also, see Smith to May, 6 Mar. 1970, Ibid.

[31] Packwood to Lt. Gen. Frederick J. Clark, 1 Dec. 1971, Acc. #2048 1776-1-6, box 25, Brock Evans papers.

[32] *Lewiston Morning Tribune*, edit., 2 Dec. 1971.

[33] The first quotation is in Col. Thomas Nelson, Corps of Engineers, Washington, D.C. to Jordan, 24 Mar. 1972, box 216, Jordan papers. The second is in *Lewiston Morning Tribune*, 15 Mar. 1973. For the Walla Walla District's opposition to deauthorization, see the *Tribune* for 25 Nov. 1974. For additional background, see Seattle *Daily Journal of Commerce*, 3 Jan. 1976; and the *Tribune* for 2 Jan. 1976, 3 Jan. 1976, and 11 Jan. 1976. Willard Sivley, the Walla Walla District's Chief of Planning during the early 1970s and later Chief of the Engineering Division, in response to an earlier draft of this manuscript to WWD PAO, Dec. 1991, wrote, "The Corps move to place Asotin Dam on inactive status was to a large degree motivated by a desire to solve fish problems prior to its construction. Most of these problems surfaced during the construction of the lower Snake and Columbia dams. The authors have a tendency to equate all Corps actions to political purposes. The Corps of Engineers is made up of people, most of whom had deep concern for fish problems." There is no doubt that many Corps employees had and still have deep concern over fish problems. But to disassociate Corps' actions at Asotin from the politics surrounding that project would be inaccurate.

[34] The quotation is in *Lewiston Morning Tribune*, 6 Jan. 1979.

[35] *Lewiston Morning Tribune*, 15 Sept. 1977; 17 Apr. 1979.

[36] Fredericks, memorandum to Engineering Division Files, 25 Mar. 1977. For the Corps' tepid agreement to get involved in the studies at all, see Walla Walla District Engineer Col. Christopher Allaire to Maurice Lundy, Bureau of Outdoor Recreation, 20 Jan. 1977. Both in "Wild and Scenic River Studies" file, WWD EDF.

[37] Allaire to Lundy, 2 May 1977; W.E. Sivley, Chief, Walla Walla District Engineering Division to Russell Dickenson, National Park Service, 3 Aug. 1977; Richard Pole, North Pacific Division Asst. Director of Civil Works to North Pacific Division Engineer, 26 Je. 1979. All in Ibid. Also see "Asotin Dam," Information Paper, 28 Aug. 1987, WWD PAO.

[38] The quotation is in *Moscow Idahonian*, edit., 3 Mar. 1988. For other groups opposing the permit see *Lewiston Morning Tribune,* 25 Feb. 1988, 2 Apr. 1988, 3 May 1988, and 12 May 1988 (edit.); and *Clarkston Valley American*, 2 Mar. 1988, 25 May 1988.

[39] The quotation is in *Lewiston Morning Tribune*, 3 Mar. 1988. For more on the PUD see the *Tribune* for 18 Feb. 1988; and the *Clarkston Valley American*, 9 Mar. 1988.

[40] "Asotin Dam," Information Paper, 28 Aug. 1987, WWD PAO.

[41] *Lewiston Morning Tribune*, 1 Mar. 1988, 8 Nov. 1988.

Chapter 12
A River of Compromise

The lower Snake River has always been a lifeline. It was to prehistoric people who made homes along its banks 10,000 years ago, providing them with plentiful food and water.

After Len White piloted the *Colonel Wright* to Lewiston in 1861, it became a lifeline of a different sort, an access route bringing supplies to settlers and exporting materials, first gold and then wheat, to a wider world. When massive barges began plying the river's slackwater pools, its range of influence expanded. Products from as far away as North Dakota then made it to lower Snake ports on their way to international markets.

With the coming of multipurpose dams, the river became a different type of lifeline, producing electricity to energize homes, schools, hospitals, and businesses.

Yet, each time people added benefits they changed the stream's nature. As early as the 19th century, the Corps of Engineers cleared the river by removing rocks and snags, comparatively minor alterations. But even this activity destroyed some natural river features, such as riffles and pools upon which fish depended. As the transportation system became more complex and Lewiston got its seaport, the Corps found it necessary to systematically dredge the waterway, another compromise with nature.

The concrete monoliths that generate electricity also obstruct fish. So today, lower Snake dams have laddered fishways and multi–million dollar bypass systems, while sophisticated barges transport fish along rivers they once swam.

The lower Snake, altered and developed, has brought economic benefits. Yet these gains came at a cost. Decisions about the river's future will be just as difficult as those in the past, for there is little consensus on managing the lower Snake. If this river is to stay alive, a place where nature coexists with development, then vigilant compromise will always be essential.

The compromise is visible at the Port of Wilma, one of eight port facilities along the lower Snake. It sits across the river from Clarkston at a spot where Meriwether Lewis and William Clark once spent a "cold and disagreeable" night in May 1806. [1]

Wilma, operated by the Port of Whitman County, is the river's largest, and here Herbert West's dream came true. Build the dams and development will follow, West believed, and development certainly came to Wilma. From this location grain goes to Portland, log houses travel to Japan, and wood chips venture to Longview. Wilma's factories plane lumber, cut railroad ties, and manufacture concrete blocks. Petroleum tanks sit along shore to await filling by fuel–carrying barges. To keep all this economic activity humming on its 250 acres, the Port of Wilma operates a water and sewer system capable of servicing a town of 500. A well–maintained road splits the site.

Some of the compromise at Wilma is ironical. The port owns its own rail spur, and the Camas Prairie Railroad parallels its property. In addition to barge facilities, shippers gain access to Wilma's facilities via truck and train.

With the exception of conservationists, railroads most persistently criticized lower Snake development. The animosity between water and rail shippers never really ceased. But port districts attempt to foster economic development in many ways. While they front the river, which furnishes their primary sustenance, ports like Wilma also encourage entry by trains. Ports that brought unwanted competition to railways now embrace them.

But the cooperative attitude is not always reciprocated. In 1990, the Union Pacific Railroad proposed to abandon 70 miles of rural tracks in Whitman and Spokane counties, claiming these no longer generated profits after wheat traffic shifted nearly exclusively to barges upon completion of the lower Snake waterway. Peas and lentils were the only products left for the UP, and the company lost about a quarter million dollars annually shipping them.

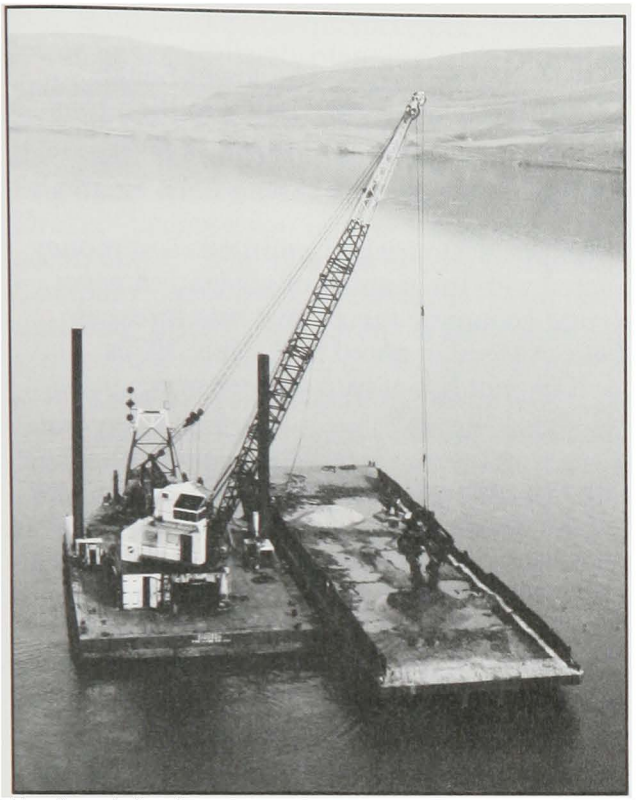
The Port of Whitman County led the fight opposing abandonment. It, along with other ports, struggled long and hard to gain slackwater, often battling railroads that claimed they could not compete with subsidized barge transportation. Once the ports won that struggle, they continued contesting railroads, hoping to force them to keep open unprofitable lines. It was a case of wanting cake and frosting, too. But the Port lost its battle when the Interstate Commerce Commission ruled in 1990 that the Union Pacific could abandon its track. [2]

Other compromises developed at Wilma. Build a 250–acre industrial site along a river that formerly ran free, and adjustments become necessary. Wilma is not the Port of Whitman County's only asset. The port district maintains two other ports, a park and marina, and an industrial area. But Wilma is the cash cow, its rentals providing nearly 75 percent of port district revenue. [3]

With this proven ability to generate money, port officials sought to expand Wilma's facilities. But they had developed all available land, and the only way left to grow was downstream, on property owned by the Corps of Engineers.

The Corps acquired 171 acres adjacent to Wilma during Lower Granite construction and developed it as a wildlife habitat unit. In 1986, the Corps had to make some compromises with the river in order to maintain its flood control effectiveness and to keep the Port of Clarkston operating at full capacity. It needed to dredge. Removing river sediment usually is not a problem, primarily requiring time, money, and the right equipment. But finding a place to deposit dredged materials often presents difficulties, especially in a place like the Snake with steep canyon sides making deposition on land expensive. The Wilma habitat unit possessed about the only flat land accessible along the river near where the Corps needed to dredge. The Corps opted to construct three containment ponds there and fill them with dredged materials.

In 1986, dredgers placed 800,000 cubic yards of sediment in the ponds. But wildlife officials never really liked the idea of destroying the habitat unit, especially with wildlife mitigation proving so difficult. Bruce Smith of the Washington Department of Wildlife called the operation a "quick fix" that destroyed scarce animal lands to provide convenient sediment storage. As originally designed, the Wilma unit could hold another 400,000 cubic yards, but Smith maintained that "it is unreasonable and unacceptable to destroy additional wildlife habitat simply for the purpose of one more dredging event." [4]



Dredging behind Lower Granite Dam, where most sediment accumulates.

Faced with this opposition, the Corps quit depositing at Wilma. At the same time it discovered it had created some good wildlife habitat. Water seeping from the dredge piles, as well as that coming up from the ground, brought a level of moisture never before available, creating a lush environment in the unused pond. In addition, when the Corps installed a drainage conduit to the river, it also created a small wetland area near the streambank. By the late 1980s, as the Corps struggled to find places to hold dredged sediments, wildlife agencies became even less inclined to recommend further deposition at Wilma since it now had considerable wildlife value.

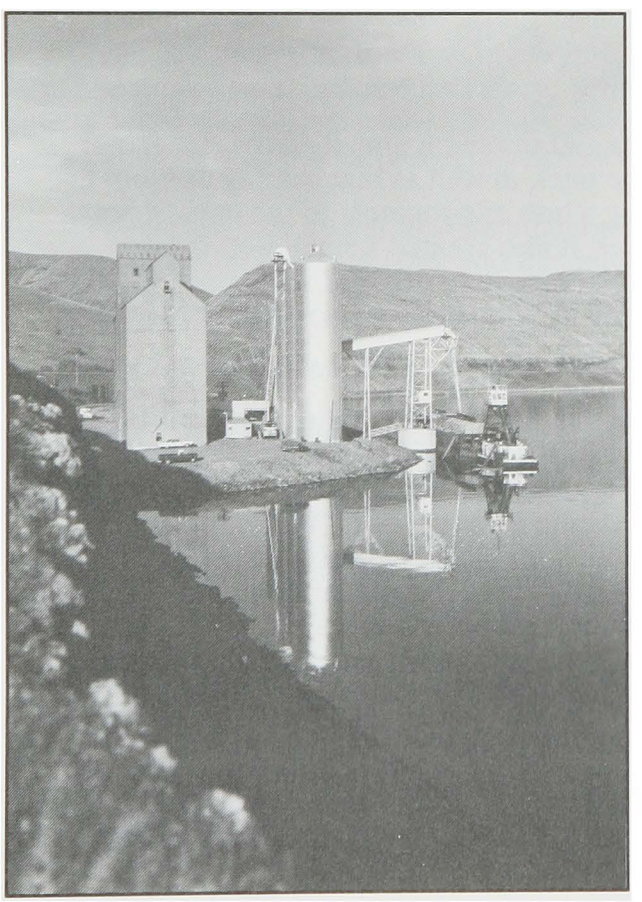
But dredging did not deter the Port of Whitman from coveting that land. Indeed, the filling process created benefits for industrial development. The Port offered to swap potential wildlife mitigation property for the Engineers' land at Wilma. Even though the Port proposed to develop a small habitat unit on the land "as a model for other ports [and] . . . developers," the exchange ran into a myriad of problems in the late 1980s. Like the Corps, when it attempted to purchase land for wildlife, the Port discovered it was easier to contemplate purchasing lands than to actually do it. It found a few willing sellers with land suitable for Corps' mitigation purposes, but most held out for considerably more than their property's appraised value. In addition, the Washington Department of Wildlife opposed the Port's plans to construct barge slips at the Wilma unit. Destroying the area's rich riparian waterfront for additional shipping construction was "not in the best interest of wildlife," it maintained. [5]

As the 1980s ended, the Corps and Port still hoped to swap land in a way that would appease both developers and wildlife defenders. At Wilma and other lower Snake ports, the compromise attendant with river development seemed obvious.

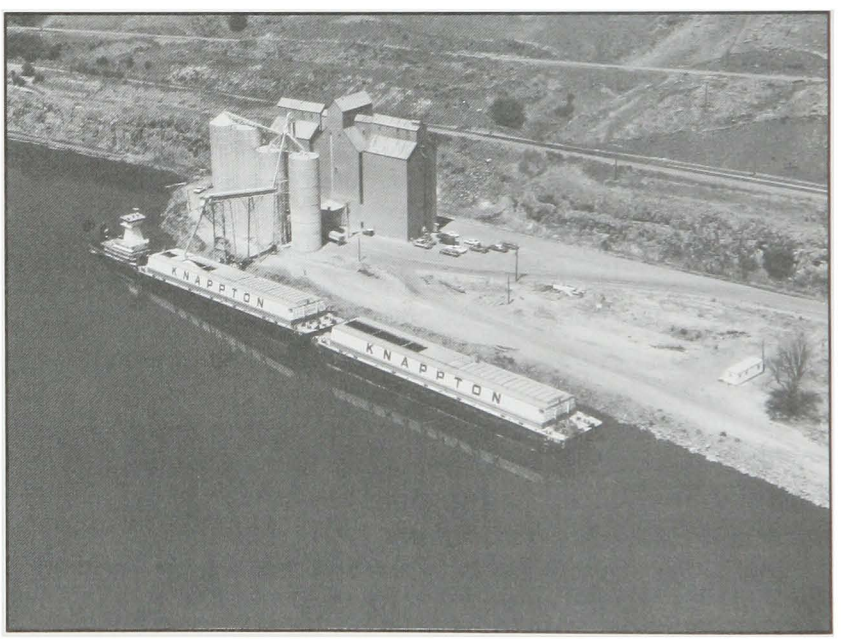
Ports like Wilma primarily stay busy shipping and receiving goods hauled by barge. The lower Snake inland waterway dramatically increased river traffic to Lewiston. In the 1980s, an average of 3.8 million tons of commodities went through Ice Harbor's locks annually. Port facilities rose and barge companies grew. Truckers hauling wheat to the river from Montana and the Dakotas thrived. [6]

But these benefits also came with compromise. Although some shippers flourished, railroads lost money on some lines. At the same time, the economic bonanza some predicted with the coming of navigation never materialized. "The arrival of slackwater by itself didn't turn us into that economic mecca that was foreseen when the whole system was designed," Port of Lewiston Manager Dale Alldredge noted in the late 1980s. While Lewiston and Clarkston experienced modest growth, the region did not boom with diverse new businesses. [7]

But as railroads vacated lines, the region became increasingly tied to river transportation, which required the Corps to keep the navigable way open. When Congress prohibited dam construction at Asotin, it created an unanticipated problem for the Army Engineers. The Snake washes tons of sand and mud downstream each year. The Corps planned for Asotin to trap much of this detritus. Without a dam at Asotin, the sediments collected behind Lower Granite, threatening navigation to Lewiston. "It's a tragedy they didn't get to build Asotin," stated former Chief of the Walla Walla District's Engineering Division Harry Drake in the 1990s. It would have caught the Snake River sediments and "it would have taken hundreds of years for the Asotin reservoir to fill with silt." [8]



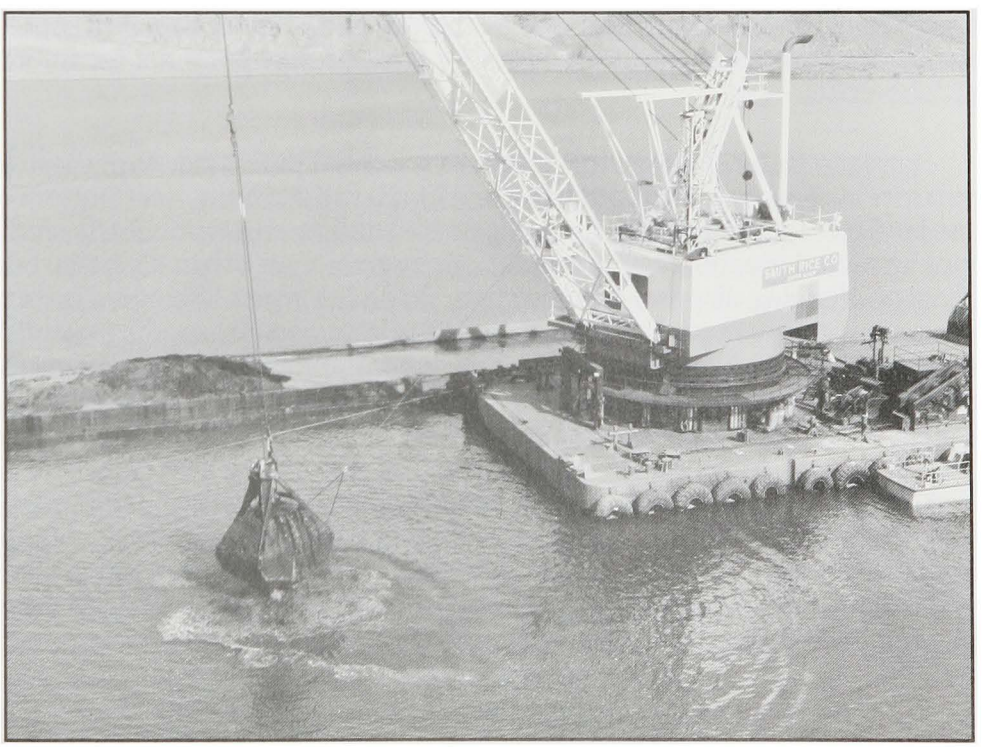
The wheat port at Almota, 1973.



Wheat barges loading at a lower Snake port.

Both Drake and his successor, Willard Sivley, commented on the frustrations the District had, during the lower Snake project's planning stages, in predicting the amount of silt that would come down the Clearwater and Snake. "Engineering is not an exact science," noted Sivley. "We knew we were going to have silt. The only surprise was the amount and location of silt. I asked the hydrologists how much siltation we'd have and they said, 'all of Idaho.' I asked the foundations geologists and they said, 'not a dime's worth.' " The Engineers tried modeling, but still could not accurately predict the problems. "You can't really model it," said Drake, "because you can get a big flow of silt all at once that will create a pile, and more silt will then accumulate." The siltation situation also grew worse when the Corps removed the Washington Water Power Company dam on the Clearwater. Now, neither the Clearwater nor the Snake had a "catching" reservoir upstream from Lower Granite, and the two rivers' confluence at Lewiston/Clarkston drew heavy sedimentation. Indeed, approximately two million cubic yards of material ended up in the Lower Granite reservoir each year, lessening the Lewiston levees' flood control capability and creating navigation hazards. Some possible long-term solutions included building sediment trapping structures in the river or improving land management practices to reduce upstream erosion. But dredging was the most feasible interim approach. Let the channels clog by slacking off on dredging, and the Corps angered tug operators and threatened homes and businesses in Lewiston. Clear the channels, and it potentially endangered fish and wildlife. Compromise was essential. [9]

If the Corps placed the dredged materials on land, it might destroy wildlife habitat. Besides, only one suitable low-cost location existed--Wilma. After the Corps partially filled that site in the mid-1980s, it contained room for only one more year's worth of dredging. Then the Corps would have to hire contractors to remove sediment by truck or train, making way for more dredged materials. Not only would that be expensive, but wildlife agencies also protested additional degradation of that site. In the early days, the Corps created artificial islands with its dredged materials. That assisted geese, but some researchers came to believe it harmed fish. So the Corps sought another alternative and came up with the idea of deep water deposition.



Dredging at the confluence of Clearwater and Snake rivers, 1988.

Prior to 1958, American dredging activities went essentially unrestrained. Conservationists expressed little concern, and the major criteria for determining whether or not to dredge was if such a project aided navigation. Congress amended the Fish and Wildlife Coordination Act in 1958 partly because of concern over marshland destruction from dredging. The National Environmental Policy Act of 1969, the 1970 Water Quality Improvement Act, the Marine Protection, Research and Sanctuaries Act of 1972, and the Federal Water Pollution Control Act of that same year all contained language attempting to limit harmful environmental effects of dredging. By the mid-1970s, environmental considerations had modified or delayed hundreds of public and private dredging projects, including many of the Corps. [10]

Since scientists in the 1970s knew little about the impact of dredging, the Corps of Engineers undertook a Dredged Material Research Program. In some ways their studies re-emphasized the growing concern over dredging. But the Corps maintained that precautions could reduce damage. "Dredging can serve the environment as well as the economy," the Engineers concluded. "There are disposal alternatives that are safe for the environment that can be established at reasonable cost. The key lies in using dredged material as a natural resource." That is what the Corps hoped to do along the lower Snake. [11]

In 1988, acting upon the advice of an interagency team working to alleviate lower Snake dredging problems, the Corps began a multi-year test of in-water disposal to determine whether this provided a possible long-term solution. The Engineers will complete the test in the mid-1990s.

At the same time, the Corps hired University of Idaho researchers to determine the effects of in-water disposal. The scientists made an important discovery when they found that young salmon and steelhead aggregated in the shallow waters of Lower Granite reservoir during downstream migration, presumably to rest and feed. Formerly, researchers believed reservoirs provided little benefit to migrating fish. Because of the apparent importance of shallow water, filling deep waters with dredged material could make more of the reservoir hospitable to smolts. As University of Idaho researcher David Bennett noted, "Fish habitat improvement on the scale proposed by the Corps has never been attempted in fresh water. But if habitat enhancement works in Lower Granite Reservoir, a new potential for improving salmon and steelhead returns to Idaho exists." [12]

But deep water deposition also poses potential problems. Will these smolt-friendly shallows also attract predators such as bass and squawfish? Will alteration of the river bottom disrupt invertebrate life? Will increased turbidity caused by dredging harm anadromous fish? Early studies indicated that some deep water zones attracted greater concentrations of sturgeon than originally believed, and researchers worried about the effects of dredging disposal on these fish. In addition, wildlife agencies and Indian tribes insisted that the Corps dredge only in winter when the river is little used by anadromous fish. But winter dredging is frequently delayed because of ice and inclement weather, and the cost is usually higher. Further, dredging in January and February, while best for fish, is the worst time for navigation. Nearly as soon as the channel is opened, it can fill again with spring run-off.

Even if the tests determine that environmental benefits of deep water disposal outweigh disadvantages, lower Snake dredging will continue to be replete with compromises. Shippers will probably not get all they want because the Corps will dredge in winter. Fishery agencies will probably not get all they desire because any dredging has the potential to cause harm. And some day all deep water sites will be full and everyone concerned will again need to re-examine the issue.

Under the heading "recreation problem," the Corps, as early as 1948, reported on the desirability of additional outdoor facilities along the lower Snake River: "Recreational opportunities abound in the mountains adjoining the populated valleys in this sub-basin, but a need exists for additional day-use recreational areas within easy driving distance from the larger towns and densely populated agricultural areas. . . . Anticipated increased recreational use of the area by vacationists will create a heavy demand for accommodation by both public and private interests." [13]

The Corps constructed more than 30 recreational sites along the lower Snake, and outdoor enthusiasts came. Indeed, the lower Snake recorded nearly 2.5 million days of recreation visitation annually by the late 1980s. "I'm real proud of what we did" with recreation along the lower Snake, said Willard Sivley. "Some people even said we overbuilt," providing too many recreational sites for a land with so little population. "But we were concerned about not building them, because once you lose your construction money, we didn't think we'd ever be able to come back and build recreation facilities. I'm surprised we got away with it, but I'm pleased we did." [14]

Constructing recreation facilities enjoyed by thousands of people each year would seem to be relatively uncontroversial. But, as with nearly everything along this river, each development seemed to come with its compromise.

After the passage of the Federal Water Project Recreation Act of 1965 (WPRA), the Corps became one of the biggest recreational institutions in the world. Between 1960 and 1975, visitation at Corps' reservoirs tripled. Although it managed only 1.5 percent of federal recreation lands by the latter date, its projects attracted 36.5 percent of recreation users. [15]

The Corps not only built but also operates a majority of the recreational facilities along the lower Snake. That is not what the agency originally planned, and this management function represents a considerable compromise in itself.

The WPRA proved a boon to recreation, enabling the Corps for the first time to figure recreational benefits when compiling project economics. But the act also brought problems making compromise necessary. The WPRA attempted to establish uniform standards for non-federal cost-sharing at Bureau of Reclamation and Corps projects. The federal government would provide 50 percent of recreational development costs, with non-federal entities absorbing the remainder of these expenses, along with all maintenance and operation charges. Congress viewed this as an expedient way to provide the nation with recreational facilities without over-charging the federal budget. But things seldom worked as smoothly as Congress anticipated. [16]

Actually, the WPRA caused nearly as many difficulties as it solved. A major Congressional study of Corps' recreational programs highlighted the legislation's weaknesses:

> *The major purposes of the WPRA were to standardize cost-sharing policies for water recreation among agencies, and to promote development of recreational facilities on federal water projects. . . . These two goals have not . . . been met. Cost-sharing provisions . . . are still far from consistent across programs and across agencies. Worse, the level of recreation facilities construction that has resulted from the Act's cost-sharing provisions is insignificant when compared to national increases in visitation at Federal water projects.* [17]

The Congressional research team found state and local governments frequently unable to cooperate with the Corps because the Engineers' large-scale projects called for cost-sharing requirements beyond local and state means. The study team noted that non-federal agencies disliked the landlord-tenant relationship established by the act. The study actually predicted that WPRA could make matters worse than before 1965. Because of the act's inflexible cost-sharing requirements, many states that had previously assisted the Corps were now unwilling to participate because they could not afford a full cost-sharing agreement.

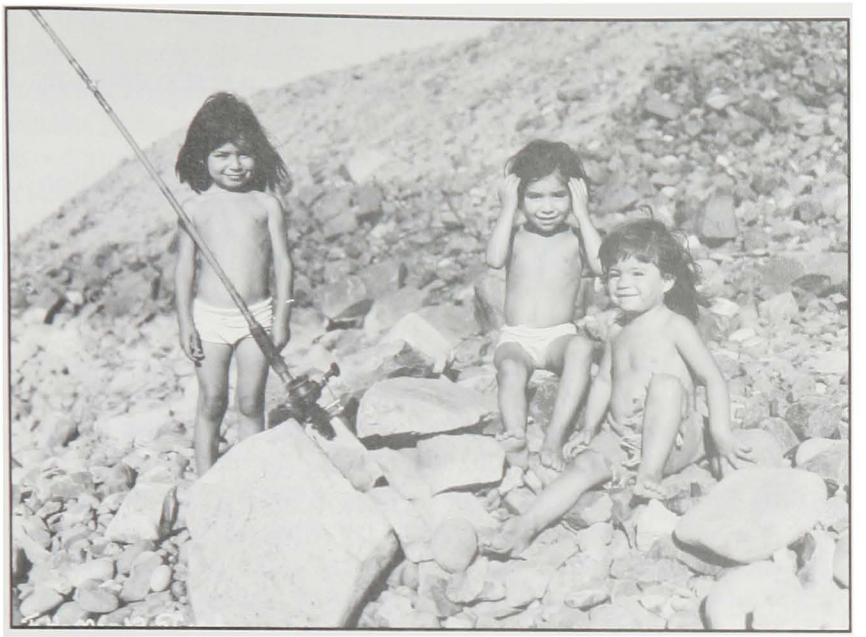
Despite the problems, the Walla Walla District wanted to make recreation effective, especially after studies prepared by the North Pacific Division placed increasing importance on recreational development in the 1970s. A Division study of its recreation program found that, partially because of the region's spectacular natural environment, it was less active in providing recreational facilities than divisions located elsewhere. Furthermore, the study claimed, the Division emphasized more traditional missions of the Corps--hydropower, navigation, and flood control--at the expense of recreation. Recreation became a prime target for personnel and budget cuts, with career development opportunities for recreation resource people limited. The study recommended improvements in the Division's program and concluded that "our challenge is no less apparent nor important than that faced at Corps projects in other regions of the country. We too must cope with increasing use pressures and must strive to provide a safe, quality experience for the visiting public." [18]

The Corps' rejuvenated interest in recreation also stemmed from an instinct of survival. Shortly after completion of Lower Granite, the last major dam planned for Walla Walla, District Engineer Colonel Christopher Allaire noted, "Most of the dams . . . in the United States have been built." Expanding on that idea, the *Lewiston Morning Tribune* reached a natural conclusion: "There are few if any rivers left to dam. . . . But the Corps isn't going to fold up its slide rules and go out of business because of that. . . . Perhaps the answer is to venture into new fields, such as . . . the development and operation of parks." [19]

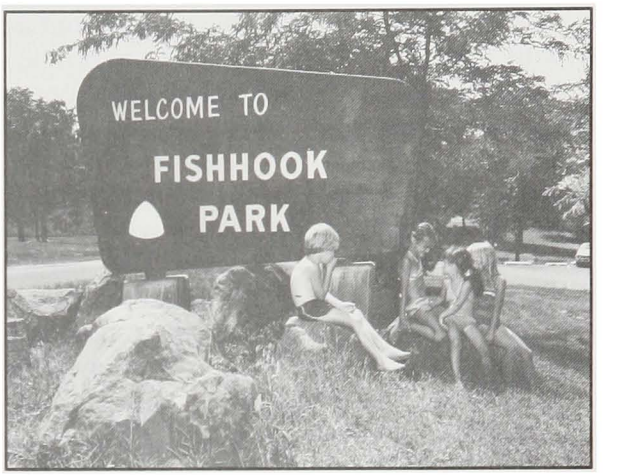
The Walla Walla District increasingly undertook both the building and management of parks along the lower Snake, often because local governments proved unable or unwilling to help share expenses. For example, the Corps constructed Swallows Park south of Clarkston in 1975. Asotin County's Commissioners signed a lease agreeing to maintain the park. But when they learned it would cost $60,000 to $75,000 annually, they returned it to the Corps. The District, citing a recent Division ruling that local agencies must accept responsibility for new parks, announced it would no longer maintain Swallows after 1976. Local residents protested, and the District sought a compromise. It entered into a temporary agreement with the county to share the burden, but, when it became apparent the county would not accept full responsibility, it had to face the difficult choice of closing a popular park or bending its guidelines. The Corps chose the route of compromise, undertaking major responsibility for maintaining Swallows Park. [20]

While the District negotiated at Swallows, some residents of the Lewiston Valley accused it of "blackmail" because it refused to construct Chief Timothy Park, seven miles west of Clarkston. "It is our belief that without a sponsor for one park, we couldn't go ahead and develop a second," explained Colonel Allaire. But eventually, the Corps did build Timothy, although not without again confronting economic difficulties brought by the WPRA. [21]

"The places where you and your parents used to play are disappearing," Charles Odegaard, Director of the Washington Department of Parks and Recreation, told a Clarkston audience in 1978. To preserve recreational potential near that city, the Parks Department attempted to convince the state legislature to provide maintenance funding for Chief Timothy. The legislature balked, questioning whether it should add new facilities to a parks system already under financial strain. But it finally agreed to the Corps' cost-sharing requirements and the District began constructing Chief Timothy State Park in 1978. [22]



The lower Snake reservoirs brought increased recreation use of the river.



Fishhook Park, 1982.

Boyer Park, 1980.

Fishing near Lower Monumental Dam, 1972.

Yet this issue would not easily go away, even after the Corps constructed all its lower Snake recreational facilities and operated most of them for years. Faced with budget cuts in 1989, the Walla Walla District announced plans to cease maintaining some boat ramps and other lightly developed sites along the river. Objections came swiftly. The Whitman County Commissioners, stating they could not absorb the expense of taking over management of Wawawai Landing Recreation Area, protested that its abandonment by the Corps "will create a hardship on people seeking to use the amenities of a hydro–electric project that was in part justified by recreational benefits." It is an issue bound to recur as federal, state, and local agencies face the realities of high recreational demand and inadequate budgets. The fine art of compromise brought a diversity of recreational facilities to the lower Snake. It will require equal attention to compromise to assure that they remain open in the future. [23]

And of course the big compromise remains, the one that pits hydropower against fish in a test combining science, nature, and money in an effort to determine whether both can survive.

The four lower Snake dams cost about a billion dollars to build and the Corps spends almost $28 million annually operating them. They would not be there if they did not generate electricity. But they do. They generate a lot of electricity. They can meet peak loads of about 3.5 million kilowatts, or more than enough to supply the needs of three Seattles. [24]

In the 1930s, the Corps estimated that the Columbia/Snake River system could become the greatest system of low-cost hydroelectric power in the United States. And by the time the Engineers completed their dam construction projects it had. Nothing has altered the Northwesterners' lifestyles more than the ability of federal dams to produce inexpensive electric power. Historians began calling the period form the 1930s to the 1970s the Pacific Northwest's "Dam Building Era." Cheap power brought electricity to homes, industrialization to the cities and towns. As Woodie Guthrie sang of the Columbia in 1941, "Your power is turning the darkness to dawn." He could have said the same about the lower Snake a few year later. By the time the Walla Walla District doubled the power-producing ability of each lower Snake dam in the 1970s, Ice Harbor, Lower Monumental, Little Goose, and Lower Granite produced about the same amount of hydroelectricity as the entire Tennessee Valley Authority. [25]

In 1937, J.D. Ross, first executive officer of Bonneville Power Administration, spoke of the Columbia River's potential to product electricity. "A great river is a coal mine that never thins out," he said. "It is an oil well that never runs dry. The Columbia River will run through ... dams... as long as the rain falls and water flows downhill to the sea." Indeed, water flowing through dam turbines has brought an economic boom to the Northwest that few could have imagined in pre-Bonneville days. But probably for as long as Columbia River water has flowed downhill to the ocean, it has also carried juvenile salmon and steelhead to the sea and served as a water highway for adult fish making their way upstream. And the hydroelectric dams upon which the Pacific Northwest depends have been anything but a boon to fish. [26]

Nowhere are lower Snake compromises more apparent than at its dams. Underneath their glistening tiled floors are six turbines. Resting at the bottom of each unit, 140 or so feet below the surface of the reservoirs the dams hold back, are six blades, each taller than a man. The blades rotate 90 revolutions a minute when water rushes through. Spinning away like that, each lower Snake dam can generate enough electricity to serve Portland's needs. A maze of galleries weave through the dam, providing maintenance access to tons of concrete and miles of sophisticated electrical technology. Employees ride bicycles through the galleries, facilitating travel in the monster structures. They pedal past mazes of pipes and cables and machinery. This is where most of the money went in days past, building and equipping and maintaining these structures so they would produce electricity.

Some say the Corps of Engineers has not adequately balanced the needs of energy and fish. But few would argue that the Corps has not spent a lot of money attempting to save salmon and steelhead. Today, the glamour and publicity--and the controversy--comes not from electricity, but from the Corps' efforts to care for fish. By 1996, the Corps will have invested nearly $750 million on fish protection and mitigation in the Columbia Basin. [27]

The Corps is spending much of that money along the lower Snake. Some of the investments are highly visible, like the $9 million juvenile bypass system at Little Goose, the half dozen Juvenile Fish Transportation Program barges, the fish ladders, the counting stations. Much of the money is spent for projects largely hidden from public view, such as the research projects, the laboratories where biologists examine juveniles for stress and damage, the rice–sized Passive Integrated Transponder tags that some fish carry allowing researchers to monitor activity throughout their lives, the fish hatcheries scattered through three states––often many miles away from the dam sites, and the dissolved gas monitoring stations that transmit river data every four hours by satellite to a central computer bank in Portland. Scientists, engineers, laborers, pilots––all these and many more are involved in the high–tech effort to preserve Snake River fish runs. [28]

But some criticize such reliance on wizardry. "We've squeezed benefits out of the river with technology," notes Bill Bakke, executive director of the conservation group, Oregon Trout. "And now we're trying to fix the problem with technology. It's not working." There are others who agree. [29]

Some now question the dramatically increased emphasis on producing hatchery fish that came with the Lower Snake River Fish and Wildlife Compensation Plan, calling this a "feed lot" approach to preserving Idaho salmon even though most fishery agency biologists believed the hatcheries were a good idea at the time of authorization, and most still do believe there is a need for hatchery fish. But hatchery stocks are generally weaker and more prone to illness than wild ones. Yet they compete for food and can pass on diseases to wild fish. To rely on hatchery fish means to restrict gene pools and possibly threaten survival. So people in the 1980s and 1990s came to demand that more be done to preserve Idaho's wild salmon stocks.

In 1989, Idaho's Shoshone–Bannock Tribe requested the National Marine Fisheries Service (NMFS) to list Snake River sockeye salmon as endangered. A few months later, Oregon Trout similarly petitioned for Snake River wild chinook. "An endangered species listing could make the spotted owl controversy look like a pillow fight," claimed Idaho Fish and Game Department biologist Steve Pettit, referring to the Northwest's most publicized environmental debate prior to the salmon issue. In 1991, NMFS designated the sockeye as endangered. [30]

It might already be too late to save the sockeye. Only three adults made it past Ice Harbor in 1989 and 1990. It could be possible to re–introduce a new strain of sockeye in the future. But the bigger short–term issue is that Idaho's wild chinook salmon have been listed as threatened. Ramifications could be far–reaching. To provide more streamflow for fish, south Idaho irrigators might be ordered to use less water. Hydropower generation could plummet and electricity rates skyrocket. The region might have to rely more on alternative power sources, such as coal plants, which could increase acid rain, or nuclear plants, with their own potential problems. Drawing down reservoirs could disrupt barge traffic and increase shipping expenses. Commercial fishing harvests might be limited. Sports fishers might have to do without catching salmon at all, at least for a few years. The ramifications of that would reverberate throughout the region at a time when tourism is the area's primary growth industry. All the previous compromises along the river could pale in comparison to the decision on how to save endangered salmon.

Beyond that is the question of whether letting more water run down the river would work. The Corps instituted an experiment in the spring of 1991 to flush more water through the lower Snake system by releasing larger amounts than usual for that time of year from Dworshak Dam and lowering lower Snake reservoirs. In 1992, the Corps undertook an experimental drawdown of the Lower Granite pool in an effort to determine how structures might fare if the agency annually drew down the reservoir in an effort to increase river velocity to aid smolts. But the lower Snake and Columbia are now a series of broad reservoirs. Some Corps officials maintain that the entire flow of the Snake would not bring streamflow rates back to historical levels. And to reduce reservoirs too much would leave all that sophisticated fish passage equipment high and dry, perhaps killing even more fish. Some fishery agencies and conservation groups, on the other hand, maintain that additional flow will help. All agree that any long–term alternative is going to be expensive. [31]

So, of course, the possibility exists that people will finally give up, and let the wild fish die. "I'm not sure the cost of preserving these fish is going to be worth it," claimed Allan Scholtz, an Eastern Washington University biologist, in 1990. That was a minority view. But if the salmon are listed as endangered, bringing major lifestyle disruptions, others might openly question the feasibility of saving them. [32]

The issue is more complicated than the spotted owl controversy because it affects many more people. In addition, the salmon, unlike the owl, is more than an indicator species. It is an economic resource in itself, and economics will weigh heavily in any decision to reallocate water use.

The Columbia/Snake system no longer has the water, power, or fish to provide for all who want a part of the streamflow. Deciding who gets less than they desire will comprise, perhaps, the Northwest's most critical environmental concern in the 1990s. It will be the biggest issue of compromise along the lower Snake. [33]

This river of compromise, developed by the Army Corps of Engineers, brought benefits: irrigation, increased recreation, flood control, navigation, and, most of all, hydroelectricity. It brought change: archaeological sites, towns, and farms buried; rapids submerged. And the benefits and change came at a cost: hundreds of millions of dollars spent; wildlife habitat inundated; and runs of wild fish threatened.

Each action the Corps took along the lower Snake seemingly required a reaction to maintain the delicate balance of compromise. Archaeologists, farmers, developers, conservationists, river pilots, railroads, power companies––each, in their turn, accused the Corps of moving either too fast or too slow. The diversity of that criticism, in itself, indicates the complexity of the issues raised and the compromises made.

Congress authorized the Lower Snake River Project in 1945, nearly 85 years after open river advocates first began clamoring for a navigable waterway between Lewiston and the Pacific. Yet it would be another 30 years after authorization before the Corps completed its link of dams backing slackwater to north–central Idaho's largest town.

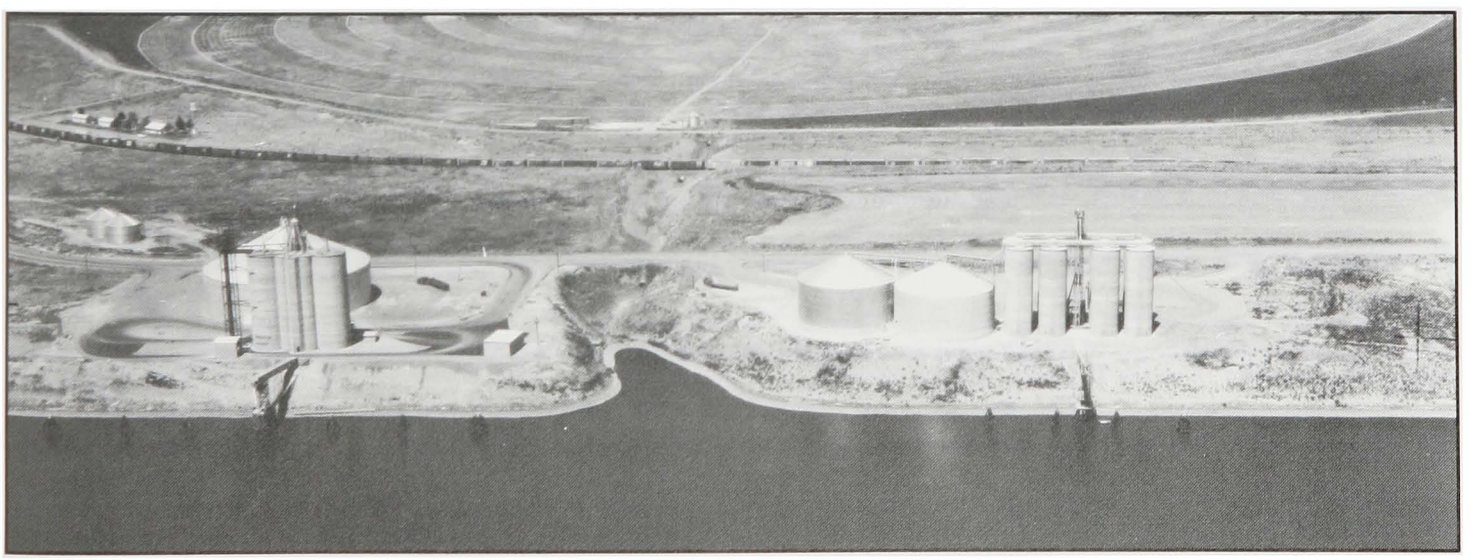
Each step the Corps took along the river came with debate, criticism, and compromise; also plaudits, praise, and awards. The river looked considerably different in the 1980s than the Corps originally envisioned in the 1940s. The Engineers built one less dam than they had planned, created more recreational areas, developed wildlife habitat units, and provided expensive fish passage facilities. The final product probably did not completely satisfy anyone. But that is the nature of compromise. The Corps attempted to adapt a river to meet most of the needs of most of the people.

Yet, after years of meticulously planned development, after the Corps had built all the dams it was going to build along the lower Snake, the potential remained that the compromises of the past would pale before those necessary in the future.

In 1990, California had 26 percent more people than it did in 1980. Its population dwarfed all the Pacific Northwest states combined, as did its energy needs. Its requests for Columbia/Snake River power would continue to rise, and with each demand that dams generate more power would come the need to merge power requirements with those of fish.

California's increasing population, combined with a long drought, also brought to the surface old schemes to divert Columbia River water to the south. For perhaps the first time in the environmental era, after people had learned of the ecological necessity of fresh water dumping into salt at places like the Columbia's mouth, California politicians in 1990, facing meetings filled with irate constituents, began speaking of all water pouring into the sea as "wasted." Few politicians living in the state where the Colorado River dies in mud flats without reaching the ocean, a river exhausted on irrigation and hydropower, would have dared called fresh water entering the ocean "wasted" just a few years earlier. The complexities of drought, combined with a mushrooming population, made some people desperate. Columbia/Snake water diversion, a concept most Northwesterners thought dead in the 1980s, had resurfaced. The prospect of channeling water to help meet California's needs seemed distant in 1990, but people took it seriously enough that the governors of Washington, Oregon and Idaho, recognizing the disruption to farming, navigation, fishing, and power production of such an endeavor, spoke out loudly against the idea, attempting to squash the concept before it had a chance to germinate and grow.

Even if the Northwest proves able to hold off Californians and their increasing energy and water needs, it still faces a myriad of compromises. The fact of the matter is that people have altered nature along the lower Snake. Yet despite sophisticated technology and engineering capability, it is impossible to control nature. Of what consequence are four man–made concrete dams to a river that has known the Missoula Floods? The Snake has always adjusted to impediments thrown in its way. It will in the future. Whether that adjustment will one day result in catastrophe, or whether it will continue to provide benefits for future generations, depends largely upon the judgment of people continuing to work with and coax nature.



Completion of the four lower Snake locks and dams created the long–anticipated open river to Lewiston and fostered a string of ports along the river, such as this one at Central Ferry.

"It pays to know there is just as much future as there is past," naturalist Loren Eiseley once wrote. We tend to forget that. We carefully analyze our past but generally stop our contemplations at the present. We are the centers of our universes, not those who will follow. We are much more curious about how we came to be where we are than in how others will some day live. To be sure, some people project into the future, but too often theirs is a fanciful and humorous image, not a carefully conceived one. Even the environmental era has ushered in too little thinking about posterity, perhaps because environmentalists have so far viewed their task as brush fire extinguishers. They seem so busy trying to save people from themselves in the short–term that they take little time to think about the long–term. [34]

But in places like the lower Snake River it is time to begin planning for the distant future. For this is a river that has already been a lifeline to humans for 10,000 years. Provided people still live in the area 10,000 years from now, it will of necessity continue to be a lifeline. And the decisions we make, the compromises we choose, will affect not only our children, but theirs, and theirs, distant generations we seldom contemplate, but people who, nonetheless, will thank us if we choose wisely. The U.S. Army Corps of Engineers has been an integral player in this river of compromise. It will continue to be in the future as it works with agencies, groups, and individuals to weigh values and alternatives, to search for solutions, to remain a steward of this water that serves as a lifeline for so many.

Endnotes

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[1] The quotation is in Thwaites, ed., *Original Journals of the Lewis and Clark Expedition, 1804-1806*, vol. 4, p. 355. Unless otherwise cited, information concerning the Port of Wilma and the Port of Whitman County is taken from three interviews with the authors in May 1990: Jack Thompson, Port of Whitman County Manager; Jim Weddell, Assistant Port Manager; and Eldon Crisp, Wilma Port Superintendent. Also see *Lewiston Morning Tribune*, 21 Je. 1987.

[2] The story of the railroad abandonment and Port efforts to prevent it was featured regularly in regional newspapers in the period from April–June, 1990.

[3] For revenue statistics, see "Fact Sheet," 1988, available from Port of Whitman County.

[4] Smith to Michael Passmore, Chief, Walla Walla District Environmental Resources Branch, 14 Apr. 1989, "Lower Granite––Environmental Studies" file, book 5, WWD EDF. For additional background on the Wilma unit and depositing dredged materials, see Walla Walla District Engineer Col. James Royce to Smith, 15 Dec. 1987, Ibid.; and "Wilma Land Exchange," Information Paper, 5 Mar. 1987, WWD PAO.

[5] The first quotation is in Jack Thompson, Manager, Port of Whitman County to Ronald Barrett, Walla Walla District Planning Division, 24 May 1989; the latter in Smith to Passmore. Both in "Lower Granite––Environmental Studies file," book 5, WWD EDF.

[6] For statistics, see Information Papers on the four lower Snake dams, 5 Oct. 1990, WWD PAO.

[7] For the economic impacts of navigation, see *Lewiston Morning Tribune*, 10 Aug. 1980, 11 Aug. 1980, 14 Aug. 1980, 25 Jy. 1982; *Tri–City Herald*, 12 May 1988, "Navigation," Information Paper, 5 Oct. 1990, WWD PAO; and Jameson, Petersen, and Reed, *Walla Walla District History, 1975–1980*, pp. 200–204.

[8] Harry Drake, interview with the authors, 27 Apr. 1992.

[9] For concise background on the dredging problem at Lower Granite, see "Lower Granite Lock and Dam: Sedimentation Studies and Interim Dredging," Information Paper, 14 Dec. 1989, WWD PAO. Although there were several places along the Lower Snake that required occasional dredging, the biggest problem came in the lower Granite reservoir, home to the vast majority of sediment washed down the Snake and Clearwater. For additional background on the dredging at Lower Granite, the difficulties it caused, and various alternatives considered, see *Lower Granite Environmental Impact Statement, Draft Supplement: Interim Navigation and Flood Protection Dredging* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1988); "Record of Decision . . . Interim

Navigation and Flood Protection Dredging," 20 Dec. 1988, "Lower Granite--Environmental Studies" file, book 5, WWD EDF; "Statement of Findings, Lower Granite Interim Navigation and Freeboard Maintenance Dredging," 31 Oct. 1989, "Lower Granite--Miscellaneous" file, WWD EDF; and David Bennett, "In-Water Dredge Disposal: Boon for Salmon & Steelhead?" in the *University of Idaho College of Forestry, Wildlife and Range Sciences Focus*, 13 (May 1988), pp. 22-3. There is also a considerable amount of correspondence and minutes from meetings pertaining to this issue in "Lower Granite--Sedimentation" file, WWD EDF. The quotations are from Harry Drake, interview with the authors, 27 Apr. 1992; and Willard Sivley, interview with the authors, 28 Apr. 1992.

[10] One of the best analyses of dredging and the environment, albeit sometimes quite technical, can be found in *Proceedings of the Speciality Conference on Dredging and Its Environmental Effects* (New York: American Society of Civil Engineers, 1976). For a brief "layman's" introduction, as well as discussions of the possible beneficial uses of dredged materials, see John Crowder, "An Honorable Discharge for the Biggest Pollutant," *Parks and Recreation*, 12:2 (Feb. 1977), pp. 28a-30a; and Brig. Gen. W.O. Bachus, "Beneficial Uses for Dredged Material," *Military Engineer*, 67:436 (Mar.-Apr. 1975), pp. 72-3. For dredging legislation, see Kenneth S. Kamlet, "Impact of Public Law 92-532 on Dredging and Disposal," pp. 49-82; Charles W. Hollis, "Legislative Impacts on Dredging General Regulatory Functions," pp. 1-9; and James H. Bradley, "Dredging and the Environmental Policy Act of 1969," pp. 39-48; all in *Dredging and Its Environmental Effects*.

[11] A brief synopsis of the results of the Dredged Material Research Program results can be found in *Dredged Material: A Potential Resource* (Vicksburg, MI: U.S. Army Engineer Waterways Experiment Station, n.d.).

[12] Bennett, "In-Water Dredge Disposal," p. 23.

[13] *Review Report on Columbia River and Tributaries, Appendix I, Middle and Lower Snake River Basin* (Portland: U.S. Army Corps of Engineers, North Pacific Division, 1948), p. I-71.

[14] Statistics are available in Information Papers on each lower Snake dam, all dated 5 Oct. 1990, WWD PAO. A "visitor day" is the use by one person at a park area for all or any portion of a 24-hour period. One "visitor" can potentially be counted several times by leaving and then re-entering the park, or can visit several parks in the same day briefly and be counted at each. Recreation personnel have developed complex formulas to determine such things as how many visitors arrive in each car. The compilation of visitation statistics is not without its critics. In 1973, the Water Information Center disputed the visitation figures of federal agencies, saying that errors came from compounding estimates from a large number of divergent sources. Nonetheless, though the figures may not be totally accurate, there is no dispute that Corps' parks have experienced a rapid increase in visitation, or that the Engineers are a leader in outdoor recreation. See *Water Policies for the Future: Final Report to the President and to the Congress of the United States by the National Water Commission* (Port Washington, NY: Water Information Center, 1973), p. 198. The quotation is from the Sivley interview.

[15] See *Water Policies for the Future*, p. 198; Reynold Edgar Carlson, et. al., *Recreation and Leisure: The Changing Scene* (Belmont, CA: Woodsworth Publishing Co., 1979), pp. 131-32; and Jean Harrison, "The Corps' Stake in Recreation," *Parks and Recreation*, 10:3 (Mar. 1975).

[16] Foss, *Conservation in the United States*, pp. 454-60; Hart, "Corps Lands: Is Anybody Minding the Store?", pp. 16-19.

[17] U.S. Congress, *Studies of the Federal Water Project Recreation Act: Its Operation in the New England Division, Army Corps of Engineers and Technical Issues*, 94th Cong., 1st Sess., 1975, Sen. Committee on Interior and Insular Affairs, Committee Print, p. 3.

[18] *North Pacific Division Recreation Program Overview* (Portland: U.S. Army Corps of Engineers, North Pacific Division, 1978), p. 3. Also see pp. 2, 27-31.

[19] The Allaire quotation is in *Walla Walla Union Bulletin*, 18 Jan. 1977. The second quotation is in *Lewiston Morning Tribune*, edit., 21 May 1976.

[20] *Lewiston Morning Tribune*, 30 Jan. 1976, 9 Nov. 1976, 24 Nov. 1976, 2 Dec. 1976, 23 Dec. 1976, 15 Oct. 1977, 18 Dec. 1979, 2 May 1980.

[21] The quotation is *Lewiston Morning Tribune*, 24 Nov. 1976.

[22] *Lewiston Morning Tribune*, 16 Apr. 1976, 20 May 1976, 11 Dec. 1976, 6 Dec. 1978, 13 May 1979.

[23] The quotation is in Moscow *Idahonian*, 26 June 1989.

[24] Statistics are from Information Papers for each dam, dated 5 Oct. 1990, WWD PAO; and from a brochure entitled *The Lower Snake River Project* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1989).

[25] For the impact of hydroelectric dams on Northwest lifestyles, see, for example, Johansen and Gates, *Empire of the Columbia*, pp. 513–41; and Stewart H. Holbrook, *The Columbia* (New York: Rinehart and Co., 1956), pp. 292–326. For comparisons between the lower Snake and the TVA, see *Civil Engineering*, 46:6 (Je. 1976), p. 45.

[26] The quotation is in Springer, *Power and the Pacific Northwest*, p.33.

[27] News Release #90–19, 19 Apr. 1990, WWD PAO.

[28] For PIT tags, see Ruth Curtis, "The Salmon Sleuths," *Northwest Energy News*, Nov./Dec. 1988, pp. 17–19. For dissolved nitrogen monitoring, see *Dissolved Gas Monitoring for the Columbia and Snake Rivers*. The North Pacific Division, Army Corps of Engineers, publishes these summary reports annually.

[29] *Spokane Spokesman–Review*, 18 Nov. 1990.

[30] Pettit interview with the authors, 26 Sept. 1990.

[31] John McKern, Walla Walla District biologist, interview with the authors, 28 Nov. 1990; Moscow *Idahonian*, 27 Apr. 1990. Idaho Governor Cecil Andrus proposed a reservoir draw–down early in 1991 that proved to be one of the more hotly debated topics during endangered species discussions. See *Lewiston Morning Tribune*, 18 Feb. 1991; *Spokane Spokesman–Review*, 22 Feb. 1991. The experimental drawdown took place in March 1992 and the Lewiston and Spokane newspapers––along with many others in the region––extensively followed the events.

[32] *Spokane Spokesman–Review*, 22 Aug. 1990.

[33] Most major Northwest newspapers carried extensive copy about the Snake River endangered species issue in 1990 and 1991. Also, see D.W. Chapman, et. al., *Status of Snake River Sockeye Salmon* (Portland: Pacific Northwest Utilities Conference Committee, 1990). Of course, the fish crisis was a long time coming. For background on salmon and steelhead prior to the endangered species controversy, see, for example, Netboy, *Salmon of the Pacific Northwest*; Oral Bullard, *Crisis on the Columbia* (Portland: The Touchstone Press, 1968); Gerald B. Collins, et. al., *The Snake River Salmon and Steelhead Crisis: Its Relation to Dams and the National Energy Crisis* (Seattle: National Marine Fisheries Service, 1975); *Columbia Basin Salmon and Steelhead Analysis* (Pacific Northwest Regional Commission, 1976); Kenneth Thompson, *Columbia Basin Fisheries Past, Present and Future* (Pacific Northwest Regional Commission, 1976); Ernest Schwiebert, ed., *Columbia River Salmon and Steelhead: Proceedings of a Symposium held in . . . 1976, special publication no. 10* (Washington, D.C.: American Fisheries Society, 1977); and Phillip Meyer, *Fish, Energy and the Columbia River: An Economic Perspective on Fisheries Values Lost and at Risk* (Northwest Resource Information Center, 1982).

[34] The quotation is in Eiseley, *The Immense Journey* (New York: Random House, 1957), p. 48. Many naturalists and historians have written compellingly about human efforts to control nature along rivers. The literature is thought–provoking and voluminous. The following are some places researchers might start if wishing to pursue this subject. Worster's *Rivers of Empire* is the classic historical analysis of the impact of Western water developments upon people and nature. Worster's extensive documentation can lead readers to other less–comprehensive but valuable treatments of waterways history. Many of the country's finest nature writers have set their skills to contemplating the impact of human actions on rivers. Generally unsympathetic to the Corps of Engineers and Bureau of Reclamation, and sometimes overly shallow in their analysis of all of the reasons for river damming, they nonetheless provoke thoughts about the need for adequate planning to preserve resources for the future. Readers might begin their journey into this rich literature with the following: John Graves, *Goodbye to a River* (New York: Alfred A. Knopf, 1960); John Haines, *Living Off the Country: Essays on Poetry and Place* (Ann Arbor: University of Michigan Press, 1981); Edward Abbey, *Down the River* (New York: E.P. Dutton, 1982); Wendell Berry, *The Unforeseen Wilderness: An Essay on Kentucky's Red River Gorge* (Lexington: University Press of Kentucky, 1971); and Wallace Stegner, *The Sound of Mountain Water* (Garden City, NY: Doubleday & Co., 1969). Those interested in more technical literature on the environmental impacts of dams would do well to begin their research with William C. Ackermann, et. al., eds., *Man–Made Lakes: Their Problems and Environmental Effects, Geophysical Monograph 17* (Washington, D.C.: American Geophysical Union, 1973); Edward Goldsmith and Nicholas Hildyard, *The Social and Environmental Effects of Large Dams, Vol. I: Overview* (Wales, UK: The European Ecological Action Group, 1984); and James V. Ward and Jack A. Stanford, eds., *The Ecology of Regulated Streams* (New York: Plenum Press, 1979).

Bibliography

Readers desiring a more thorough listing of sources consulted for this study should review the chapter endnotes. This bibliographical essay summarizes the major works and sources of information we found most useful.

Numerous archival and manuscript repositories contain information relating to the Corps, the Walla Walla District, and the lower Snake River. Record Group 77 at the National Archives in Washington, D.C., and the National Archives —Pacific Northwest Region in Seattle maintain the historical records of the Corps. These, as well as the unarchived materials, same record group number, in the Federal Records Center in Seattle and Suitland, Maryland, can be accessed by researchers through various finding aids available at the respective repositories. In addition, Corps offices retain many records for a number of years before transferring them to records centers. Particularly useful for this study were records maintained in the Engineering Division, Public Affairs Office, Records Holding Area, and Reprographics of the Walla Walla District and the North Pacific Division.

Other manuscript repositories that retain information we found particularly valuable included the Inland Empire Waterways Association papers at Whitman College in Walla Walla; the records of various governors and state fish and game agencies at the Washington State Archives and Records Center in Olympia and the Idaho State Historical Society in Boise; and the Northwest Public Power Association papers, the Columbia Basin Interagency Committee papers, the Governor Alfred B. Langlie papers, and the Brock Evans papers, all at the University of Washington. Whitman College retains a good collection of papers of William P. Gray, one of the more prominent early steamboat pilots on the lower Snake.

Papers of Northwest congressional representatives proved to be indispensable. Among those consulted were the following: Senators Frank Church and Len Jordan, at Boise State University; Senators Warren Magnuson and Henry Jackson, at the University of Washington; Senators Charles McNary and Wayne Morse, at the University of Oregon; Representative Catherine May, at Washington State University; and Representative Compton White, Jr., at the University of Idaho.

Despite the Corps of Engineers' long and important role in the development of the Pacific Northwest, most general histories of the region ignore this federal agency. Charles Gates and Dorothy Johansen, *Empire of the Columbia: A History of the Pacific Northwest* (New York: Harper & Row, numerous editions), the basic text on Northwest history, devotes a chapter to Columbia River hydroelectric development. Two popular histories, Stewart Holbrook's *The Columbia* (New York: Rinehart and Co., 1956), and Murray Morgan's *The Columbia: Powerhouse of the West* (Seattle: Superior Publishing Co., 1949), devote considerable space to the same topic. Morgan's *The Dam* (New York: Viking Press, 1954), dealing with the Bureau of Reclamation's Grand Coulee, and William F. Willingham's *Water Power in the "Wilderness": The History of Bonneville Lock and Dam* (Portland: U.S. Army Corps of Engineers, Portland District, 1987), are the only monograph treatments of federal dams along the Columbia and Snake rivers.

Works by two prominent public figures in the Northwest, Richard L. Neuberger's *Our Promised Land* (New York: The Macmillan Co., 1938), and Clarence C. Dill's *Where Water Falls* (Self–published, 1970), provide good background on the political and social controversies associated with developing federal hydroelectric projects in the Pacific Northwest. Vera Springer's *Power and the Pacific Northwest: A History of*

the Bonneville Power Administration (Washington, D.C.: Department of the Interior, 1976), and Gus Norwood's *Columbia River Power for the People: A History of Policies of the Bonneville Power Administration* (Portland: U.S. Department of Energy, 1981), describe the growth of this power–marketing agency and its relationship to the Corps. Three popular histories lend insight into the history of navigation on the Columbia/Snake waterway and the impact of some of the Corps' early navigation projects. See Randall Mills' *Sternwheelers Up Columbia: A Century of Steamboating in the Oregon Country* (Palo Alto: Pacific Books, 1947); Fritz Timmen, *Blow for the Landing: A Hundred Years of Steam Navigation on the Waters of the West* (Caldwell, ID.: Caxton Printers, 1973); and Fred W. Wilson and Earle K. Stewart, *Steamboat Days on the Rivers* (Portland: Oregon Historical Society, 1969).

Some specific work has been done on the Corps in the Northwest, although this is a field of study still very much in its embryonic stages. An early overview is provided by Estella Dee Brown, "The Corps of Engineers in the Pacific Northwest," (unpublished Bachelors thesis, Reed College, 1952). Gordon Dodd's *Hiram Martin Chittenden: His Public Career* (Lexington: University Press of Kentucky, 1973), is a helpful biography of an early Seattle District Engineer. Charles McKinley's *Uncle Sam in the Pacific Northwest: Federal Management of Natural Resources in the Columbia River Valley* (Berkeley: University of California Press, 1952), is a valuable book on a topic too–often ignored, but since it deals with the Corps almost exclusively in the 1940s, it has a limited historical perspective. Two works by a major figure in New Deal planning commissions in the region are Roy F. Bessey's *Pacific Northwest Regional Planning: A Review* (Olympia, WA.: Division of Power Resources, 1963), and *The Public Issues of Middle Snake River Development: The Controversy Over Hell's Canyon and Nez Perce Reaches* (Olympia, WA.: Division of Power Resources, 1964). Like McKinley's study, these detail interagency cooperation and conflicts in planning water resource projects. A good political and economic history of the development of the lower Snake River projects is contained in Gordon Lee Merritt, "Prelude to Slack Water" (unpublished Masters thesis, University of Idaho, 1973). Also, see Robert D. Tininenko, "Middle Snake River Development: The Controversy Over Hells Canyon, 1947–55" (unpublished Masters thesis, Washington State University, 1967). Bill Gulick's *Snake River Country* (Caldwell, ID.: Caxton Printers, 1972) also contains information about the Corps' work along the lower river.

The Corps has published several District and Division histories detailing its work in the Pacific Northwest. For a complete listing, readers should see the endnotes to Chapter 5. Those specifically relating to the Walla Walla District and the lower Snake are Howard Preston, *A History of the Walla Walla District, 1948–1970* and *Walla Walla District History, 1970–75* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1971 and 1976), and John R. Jameson, Keith C. Petersen, and Mary E. Reed, *Walla Walla District History, 1975–1980* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1982).

Little non–technical material is available for those seeking information about the geology of the lower Snake. For the best overviews of the channeled scablands and the J. Harlen Bretz controversy, see John E. Allen, Marjorie Burns, and Sam C. Sargent, *Cataclysms on the Columbia: A Layman's Guide to the Features Produced by the Catastrophic Bretz Floods in the Pacific Northwest* (Portland: Timber Press, 1986), and *The Channeled Scablands of Eastern Washington: The Geologic Story of the Spokane Flood* (Washington, D.C.: Government Printing Office, 1976). The easiest–reading account of early man studies in North America is Brian M. Fagan's *The Great Journey: The Peopling of Ancient America* (London: Thames & Hudson, 1987). L. S. Cressman, *Prehistory of the Far West: Homes of Vanished Peoples* (Salt Lake City: University of Utah Press, 1977), and Ruth Kirk and Richard Daugherty, *Discovering Washington Archaeology* (Seattle: University of Washington Press, 1978), remain, for lay people, the best overviews of Northwest archaeology. Scholars have completed numerous theses, dissertations, and research studies regarding lower Snake geology and archaeology, and readers are referred to the endnotes of Chapters 1 and 2 for citations to some of these.

The treatment of lower Snake Indian tribes in historic times, early white exploration of the region, and the clash of cultures between Indians and whites is treated in a variety of studies. For some of the better of these, see Alvin M. Josephy, Jr., *The Nez Perce Indians and the Opening of the Northwest* (New Haven: Yale University Press, 1965); Clifford E. Trafzer and Richard D. Scheuerman, *Renegade Tribe: The Palouse Indians and the Invasion of the Inland Pacific Northwest* (Pullman: Washington State University Press, 1986); Reuben Gold Thwaites, ed., *Original Journals of the Lewis and Clark Expedition, 1804–1806* (New York: Antiquarian Press, rprnt., 1959); J.B. Tyrell, ed., David Thompson's *Narrative of His Exploration in Western America, vol. 12* (Toronto: Publications of the Champlain Society, 1916); William Stanton, *The Great United States Exploring Expedition of 1838–1842* (Berkeley: University of California Press, 1975); Erwin N. Thompson, "Man and Events on the Lower Snake River," *Idaho Yesterdays*, 5:3 (Fall 1961), pp. 10–15, 18–19; Kent D. Richards, *Isaac I. Stevens: Young Man in a Hurry* (Provo: Brigham Young University Press, 1979); Louis C. Coleman and Leo Rieman, *Captain John Mullan; His Life Building the Mullan Road* (Montreal: Payette Radio Limited, 1968); J. Gary Williams and Ronald W. Stark, eds., *The Pierce Chronicle: Personal Reminiscences of E.D. Pierce as Transcribed by Lou A. Larrick* (Moscow: Idaho Research Foundation, 1975); and *We Were Not Summer Soldiers: The Indian War Diary of Plympton J. Kelly, 1855–1856* (Tacoma: Washington State Historical Society, 1976).

By far, the outstanding work on the settlement of the Inland Northwest is D.W. Meinig's *The Great Columbia Plain: A Historical Geography, 1805–1910* (Seattle: University of Washington Press, 1968). Also see Alexander Campbell McGregor, *Counting Sheep: From Open Range to Agribusiness on the Columbia Plateau* (Seattle: University of Washington Press, 1982); John Fahey, *The Inland Empire: Unfolding Years, 1879–1929* (Seattle: University of Washington Press, 1986); J. Orin Oliphant, *On the Cattle Ranges of the Oregon Country* (Seattle: University of Washington Press, 1968); and Meinig, "Wheat Sacks Out to Sea," *Pacific Northwest Quarterly*, 45:1 (Jan. 1954), pp. 13–18. For more localized histories of the lower Snake, some more skillfully crafted than others, see Marjorie Hales, "The History of Pasco, Washington, to 1915" (unpublished Masters thesis, Washington State University, 1964); Walter A. Oberst, *Railroads, Reclamation and the River: A History of Pasco* (Pasco: Franklin County Historical Society, 1978); June Crithfield, *Of Yesterday and the River* (self–published, 1964); Elliott Gay, *Yesterday and the Day Before* (Self–published, 1975); Gene Mueller, *Lewiston: A Pictorial History* (Lewiston: Chamber of Commerce, 1986); Margaret Day Allen, *Lewiston Country: An Armchair History* (Lewiston: Nez Perce County Historical Society, 1990); and Elgin V. Kuykendall, *Historic Glimpses of Asotin County, Washington* (Self–published, 1954). The journals of the Latah, Nez Perce, Whitman, and Franklin county historical societies are indispensable for an understanding of the settlement and development of the region surrounding the lower Snake. These are, respectively, *Latah Legacy, The Journal, Bunchgrass Historian,* and *Franklin Flyer*. Both the Latah and Whitman county historical societies have large and outstanding oral history collections providing rich material for those interested in pursuing the development of the Palouse country.

Congressional sources provide the best information concerning the open river campaign, early Corps' work along the Snake, and authorization of the lower Snake project. For specific citations, see the endnotes to Chapters 5 and 6. Also helpful for background in this area are the following: William F. Willingham, "Engineering the Cascade Canal and Locks," *Oregon Historical Quarterly*, 88:3 (Fall 1987), pp. 229–57; the *Oregon Historical Quarterly*, 16:2 (June 1915), with its entire issue devoted to the open river celebrations of that year; and Walter A. Oberst, "Open River Celebrations Held in 1915," *Franklin Flyer*, 8:1 (Apr. 1975), pp. 2–3.

With the exception of the three Walla Walla District histories previously cited, historians have paid virtually no attention to the background, engineering, design, and construction of the four lower Snake dams. The exception is Ted Van Arsdol's seventeen–part history of Ice Harbor that appeared in the *Tri–Cities Herald*, Oct.–Nov., 1961.

The Corps' role in water resource development and, more specifically, its environmental activities, have come under increasing scrutiny by writers and historians in recent years. For some of the better works in this field see Todd Shallat, "Engineering Policy: The U.S. Army Corps of Engineers and the Historical Foundation of Power," *The Public Historian*, 11:3 (Summer 1989), pp. 7–27; Howard Rosen and Martin Reuss, eds., *The Flood Control Challenge: Past, Present, and Future* (Public Works Historical Society, 1988); *Bureaucracy, Policy and Change: The Impact of Environmentalism in the Corps of Engineers* (Washington, D.C.: Board of Engineers for Rivers and Harbors, 1975); Daniel Mazmanian and Jeanne Nienaber, *Can Organizations Change? Environmental Protection, Citizen Participation and the Corps of Engineers* (Washington, D.C.: the Brookings Institution, 1979); Martin Reuss, *Shaping Environmental Awareness: The United States Army Corps of Engineers Environmental Advisory Board, 1970–1980* (Washington, D.C.: Office of the Chief of Engineers, Historical Division, 1983); Robert H. Haveman, *Water Resource Investment and the Public Interest: An Analysis of Federal Expenditures in Ten Southern States* (Nashville: Vanderbilt University Press, 1965); John Ferejohn, *Pork Barrel Politics: Rivers and Harbors Legislation, 1947–1968* (Palo Alto: Stanford University Press, 1974); Jeffrey Kim Stine, "Environmental Politics and Water Resources Development: The Case of the Army Corps of Engineers During the 1970s" (unpublished Ph.D. dissertation, University of California at Santa Barbara, 1984); Steven Waller, "Public Policy as Law in Action: The Implementation of the National Environmental Policy Act of 1969 by the U.S. Army Corps of Engineers" (unpublished Ph.D. dissertation, Cornell University, 1979); and Michael C. Robinson, "The United States Army Corps of Engineers and the Conservation Community: A History to 1969," typescript, 1982, available at the Corps' Office of History, Ft. Belvoir, Virginia.

For various aspects of the Columbia/Snake river fishery, see Anthony Netboy, *Salmon of the Pacific Northwest: Fish vs. Dams* (Portland: Binfords & Mort, 1958); Netboy, *The Columbia River Salmon and Steelhead Trout: Their Fight for Survival* (Seattle: University of Washington Press, 1980); Oral Bullard, *Crisis on the Columbia* (Portland: Touchstone Press, 1968); Frank N. Schubert, "From the Potomac to the Columbia: The Corps of Engineers and Anadromous Fisheries," typescript, 1978, available at the Corps' Office of History, Ft. Belvoir, Virginia; and Courtland Smith, *Salmon Fishers of the Columbia* (Corvallis: Oregon State University Press, 1979). There is a wealth of technical material available on the topic. For some of the better and more accessible of these, see Gerald B. Collis, et., al., *The Snake River Salmon and Steelhead Crisis: Its Relation to Dams and the National Energy Crisis* (Seattle: National Marine Fisheries Service, 1975); D.W. Chapman, et. al., *Status of Snake River Sockeye Salmon* (Portland: Pacific Northwest Utilities Conference Committee, 1990); *Columbia Basin Salmon and Steelhead Analysis* (Pacific Northwest Regional Commission, 1976); Kenneth Thompson, *Columbia Basin Fisheries Past, Present and Future* (Pacific Northwest Regional Commission, 1976); *Review of the History, Development, and Management of Anadromous Fish Production Facilities in the Columbia River Basin* (Columbia River Basin Fish and Wildlife Authority, 1990); Donn L. Park, *Transportation of Chinook Salmon and Steelhead Smolts, 1968–1980, and Its Impact on Adult Returns to the Snake River* (Seattle: National Marine Fisheries Service, 1980); *Resource & Literature Review Dissolved Gas Supersaturation and Gas Bubble Disease* (Seattle: Parametrix, Inc., 1973); Donald Weitkamp and Max Katx, *Dissolved Atmospheric Gas Supersaturation of Water and the Gas Bubble Disease of Fish* (Mercer Island, WA.: Environmental Information Services, Inc., 1977). In addition, various congressional materials, dating back to the 19th century, have investigated the status of Northwest anadromous fish. Readers may find citations to several of these materials in the endnotes.

For the Lower Snake River Fish and Wildlife Compensation Plan specifically, see *Special Report for Congress: Lower Snake River Fish and Wildlife Compensation Plan* (Walla Walla: U.S. Army Corps of Engineers, Walla Walla District, 1983); and *Corps of Engineers' Acquisition of Fish Hatchery Proves Costly*, CED–81–107 (Washington, D.C.: General Accounting Office, 1981). Much of the story of the development of the lower Snake dams and the Compensation Plan is told in the numerous design memorandums, environmental impact statements, transcripts of public hearings, and other materials the Walla Walla District published over the years. These are available in the District library.

We made extensive use of Pacific Northwest newspapers. The *Lewiston Morning Tribune* has perhaps best covered the long history of lower Snake development from the 19th century on. Also useful in detailing the story are the *Walla Walla Union Bulletin* and the *Tri–Cities Herald*. Numerous people provided us with helpful information during interviews. They are noted in the acknowledgments.

Abbreviations

The following abbreviations are used in the endnotes to this book.

Brock Evans Papers:	*Papers of the Sierra Club's Brock Evans, University of Washington Library, Seattle*
CBIAC:	*Papers of the Columbia Basin Interagency Committee, University of Washington Library, Seattle*
Church Papers:	*Papers of Idaho Senator Frank Church, Boise State University*
EDF:	*Engineering Division Files*
EWSHS:	*Eastern Washington State Historical Society, Spokane*
EWU:	*Eastern Washington University Library, Manuscripts and Archives Section, Cheney*
IEWA:	*Papers of the Inland Empire Waterways Association, Whitman College Library, Walla Walla*
Jackson Papers:	*Papers of Washington Senator Henry M. Jackson, University of Washington Library, Seattle*
Jordan Papers:	*Papers of Idaho Senator Len Jordan, Boise State University Library*
LCHS:	*Latah County Historical Society, Moscow, Idaho*
McNary Papers:	*Papers of Oregon Senator Charles McNary, University of Oregon Library, Eugene*
Magnuson Papers:	*Papers of Washington Senator Warren G. Magnuson, University of Washington Library, Seattle*
May Papers:	*Papers of Washington Congresswoman Catherine May, Washington State University Library Pullman*
Nat. Arch.:	*National Archives, Washington, D.C.*
NPD:	*North Pacific Division, U.S. Army Corps of Engineers*
NPPA:	*Papers of the Northwest Public Power Association, University of Washington Library, Seattle*
PAO:	*Public Affairs Office*
RG:	*Record Group*
RHA:	*Records Holding Area*
Seattle FRC:	*Federal Records Center, Seattle*
Seattle NA:	*National Archives--Pacific Northwest Region, Seattle*

Smylie Papers:	*Papers of Idaho Governor Robert Smylie, Idaho State Historical Society, Boise*
Wash. Arch.:	*Washington State Archives and Records Center, Olympia*
White Papers:	*Papers of Idaho Congressman Compton White, Jr., University of Idaho Library, Moscow*
WSU MASC:	*Manuscripts, Archives, and Special Collections section of the Washington State University Library, Pullman*
WWD:	*Walla Walla District, U.S. Army Corps of Engineers*

Photo Bibliography

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Chapter 1				
2	6	Palouse Falls	WSU	86-039
3	7	J. Harlen Bretz	UC	"I, Bretz, J. Harlan", informal #6
4	9	Channeled Scablands	USGS	P. Weis, 43ct
5	11	Steptoe Butte	USGS	P. Weis, 82ct
6	13	top: Lower Snake River scene	UISC	6-13-2
7		bottom: Lower Snake River scene	ISHS	69-9-3K
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10		middle: Archeological work	NPW	M-1950, #22
11		right: Archeological work	NPW	M-1950, #31
12	19	Areial view of Marmas Rock Shelter	NPW	LM-M-86A-5
13	21	left: Windust Cave	WSU	45FR46
14		right: Windust Cave	WSU	45FR46
15	22	left: Native American scraping tool	WSU	45FR46
16		right: Windust artifacts	WSU	45FR46
17	23	Snake River pit house	WSU	45FR40
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23		right: Isaac I. Stevens	WSU	78-215
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35		bottom: Wheat fleet boats	ISHS	1269-A
36	48	top: Wawawai tramway	WSU	78-220
37		bottom: Wheat fields	NPD	G-1883-JD
38	51	Enoch A. Bryan	WSU	78-714
39	52	top: Fruit orchard	WSU	81-065
40		bottom: Grape harvest	WSU	93-145
41	53	top: Plum harvest	WSU	93-144
42		bottom: Packing house	WSU	81-064
43	54	top: Peach cannery workers	WSU	93-145
44		bottom left: Packing fruit	WSU	81-063
45		bottom right: Loading fruit	WSU	78-227
46	55	left: Snake River ferry	ISHS	2697
47		right: Ferry rates schedule	ISHS	1888-B
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49	57	top: Construction camp	WSU	77-045
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53		right: Cascades Canal and Locks	NPD	Cascades #156
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55		right: Loading grain	WSU	78-282
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58		bottom: Port of Lewiston	ISHS	2830
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70	102	Hanford construction	WSHS	—
71	104	Sen. Magnuson and West	WHIT	—
72	106	Vice President Johnson	NPW	PAO
73	107	Grape harvester	NPW	IH-M-208-7
74	108	top: Road surveying	NPW	IH-002

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75		bottom: South cofferdam	NPW	IH-162
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77		bottom left: Installing pumps	NPW	IH-175
78		bottom right: Cofferdam pumps	NPW	IH-174
79	110	top: Site excavation	NPW	IH-82
80		bottom left: Draft tube construction	NPW	IH-531
81		bottom right: First bucket of concrete	EWSHS	MS6, box 7, file 31
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97		right: Powerhouse construction	NPW	LM-M-212-1
98	122	Transmission towers	NPW	LM-M-107-2
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103		top right: Lower Granite construction	NPW	LGR-1862
104		bottom: Night construction	NPW	LGR-1771
105	126	top: Lower Granite project	NPW	PAO
106		bottom left: Fish bypass system	NPW	LGR-M-251-3
107		bottom right: Lower Granite powerhouse	NPW	LGR-M-260-12
108	130	left: Fish transportation barge in locks	NPW	LG0-M-166-6
109		right: Operation Fish Run barge	NPW	LGO-M-266-1
110	134	Fish tracking	NPW	LGR-M-204-2
111	136	top left: 1894 Lewiston Flood	ISHS	78-203-16
112		top right: Lewiston Levee construction	NPW	PAO
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114	137	left: Ice Harbor navigation lock and bridge	NPW	IH-M-216-13
115		right: Tug and barge in lock	NPW	LGO-M-204-4
116	138	left: Train	NPW	IHR-SP&S-435
117		top right: Track relocation	NPW	IHR-SP&S-315
118		bottom right: Tamper work on railroad track	NPW	IHR-SP&S-429
119	140	Rotor installation	NPW	IH-M-151-4
120	143	River traffic at Lyons Ferry	NPW	LM-M-188-3

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122	148	Fishwheel	OHS	—
123	150	left: Marking Smolt	NPD	FIS-0122
124		right: Marking smolt	NPD	FIS-0126
125	152	left: Backfilling around bypass system	NPW	LGO-M-201-2
126		right: Fish bypass construction	NPW	LGO-M-276-27
127	154	top: Seaplane	NPW	LGR-M-99-7
128		middle left: Plastic pipe	NPW	LGR-M-255-35
129		middle right: Tanker transport	NPW	LGO-M-72-5
130		bottom left: Barge	NPW	LGO-M-266-7
131		bottom right: Barge	NPW	LGO-M-266-1
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135		bottom right: Outfall	NPW	PAO
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138		top right: Sawtooth Hatchery	NPW	M-1949-22
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160		top left: Recreation	NPW	IH-M-125C-1

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162	bottom right: Fishing	NPW	LM-M-107-1
163 209	River traffic	NPW	LGO-M-249-5

Source Reference for Repository Locations

BSU:
The Library
Boise State University
1910 University Drive
Boise, ID 83725

EWSHS:
The Library
Eastern Washington State Historical Society
W. 2316 First Ave.
Spokane, WA 99204

ISHS:
Idaho State Historical Society
610 N. Julia Davis Drive
Boise, ID 83702

LCHS:
Latah County Historical Society
110 S. Adams
Moscow, ID 83843

NPD:
US Army Corps of Engineers
North Pacific Division
Visual Information Division
P.O. Box 2870
Portland, OR 97208-2870

NPP:
US Army Corps of Engineers
Walla Walla District
Walla Walla, WA 99362-9265

OHS:
The Library
Oregon State Historical Society
1230 S.W. Park Avenue
Portland, OR 97205

UC:
University of Chicago Library
1100 E. 57th Street
Chicago, IL 60637-1502

UISC:
Special Collections
University of Idaho Library
Moscow, ID 83843

WHIT:
Penrose Library
Whitman College
Walla Walla, WA 99362

WSHS:
Washington State Historical Society
315 N. Stadium Way
Tacoma, WA 98403

WSU:
Manuscripts, Archives and Special Collections
Holland Library
Washington State University
Pullman, WA 99164

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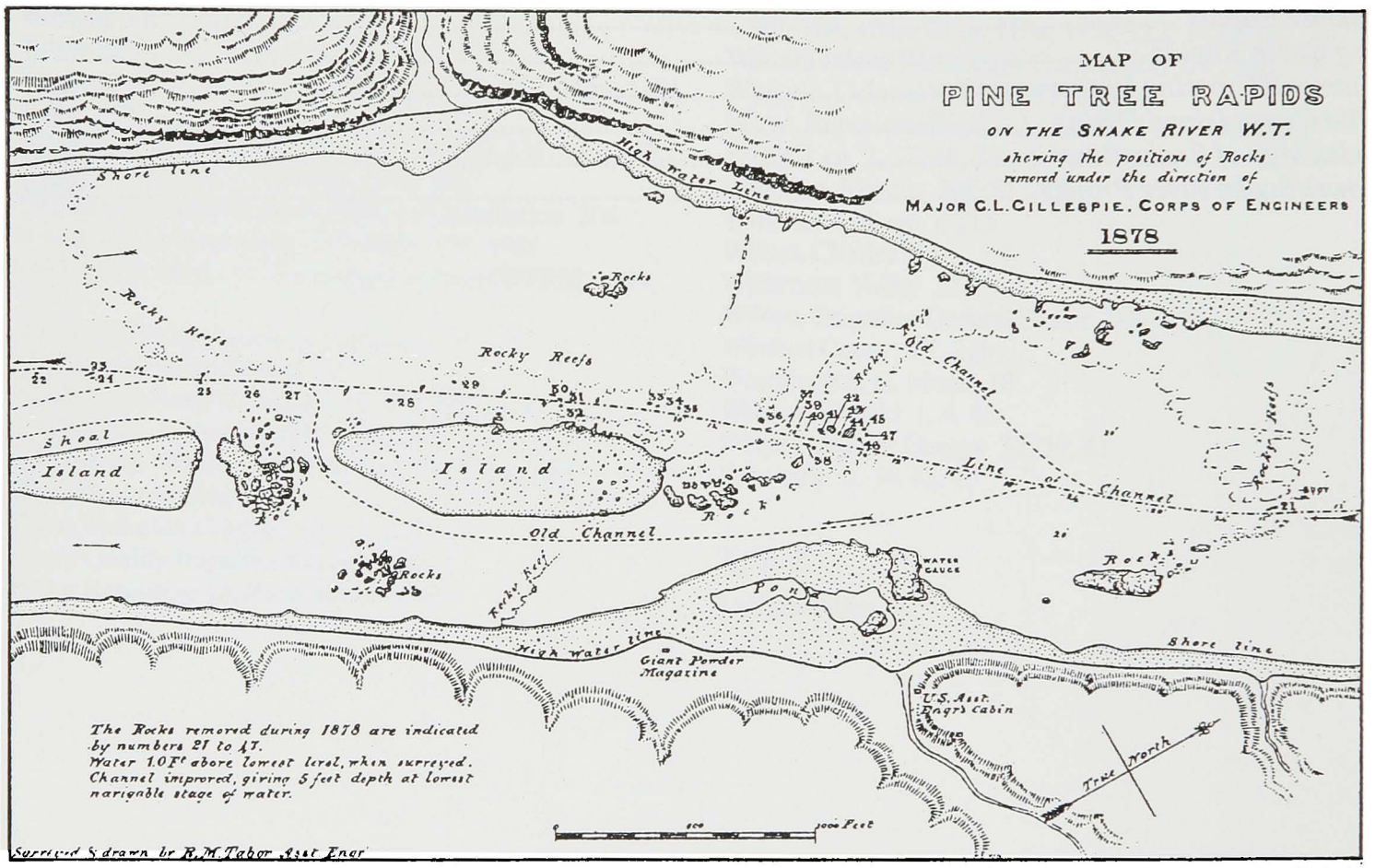
Maps

Pine Tree Rapids *showing rock removal for channel improvement.*

from Annual Report of 1879



U.S. ENGINEER OFFICE, PORTLAND, OREGON.

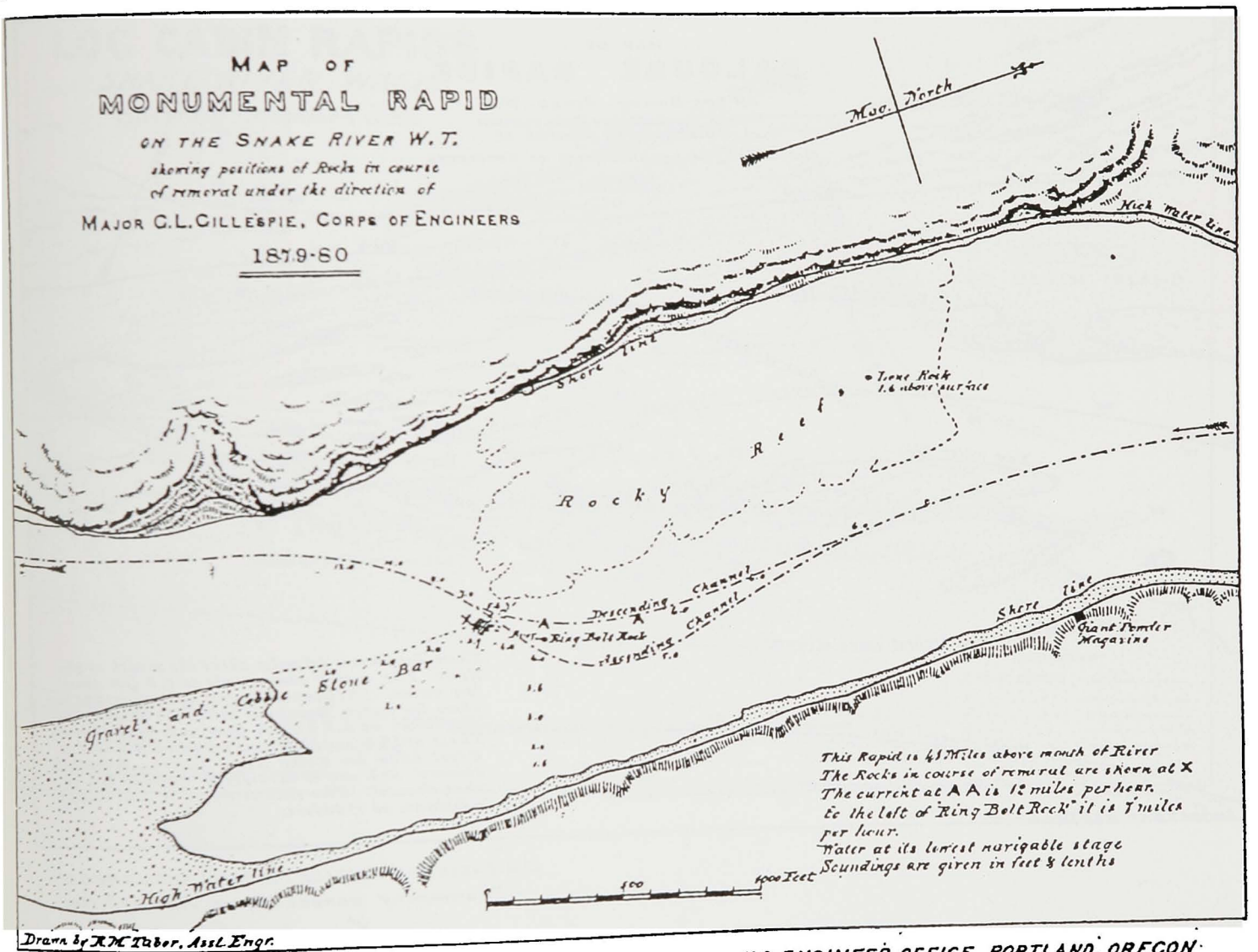
To accompany annual report. June 30th 1879.

G. L. Gillespie

Major of Engineers. Bvt. Lt. Col., U.S.A.

Monumental Rapids showing rock removal.

from Annual Report of 1880



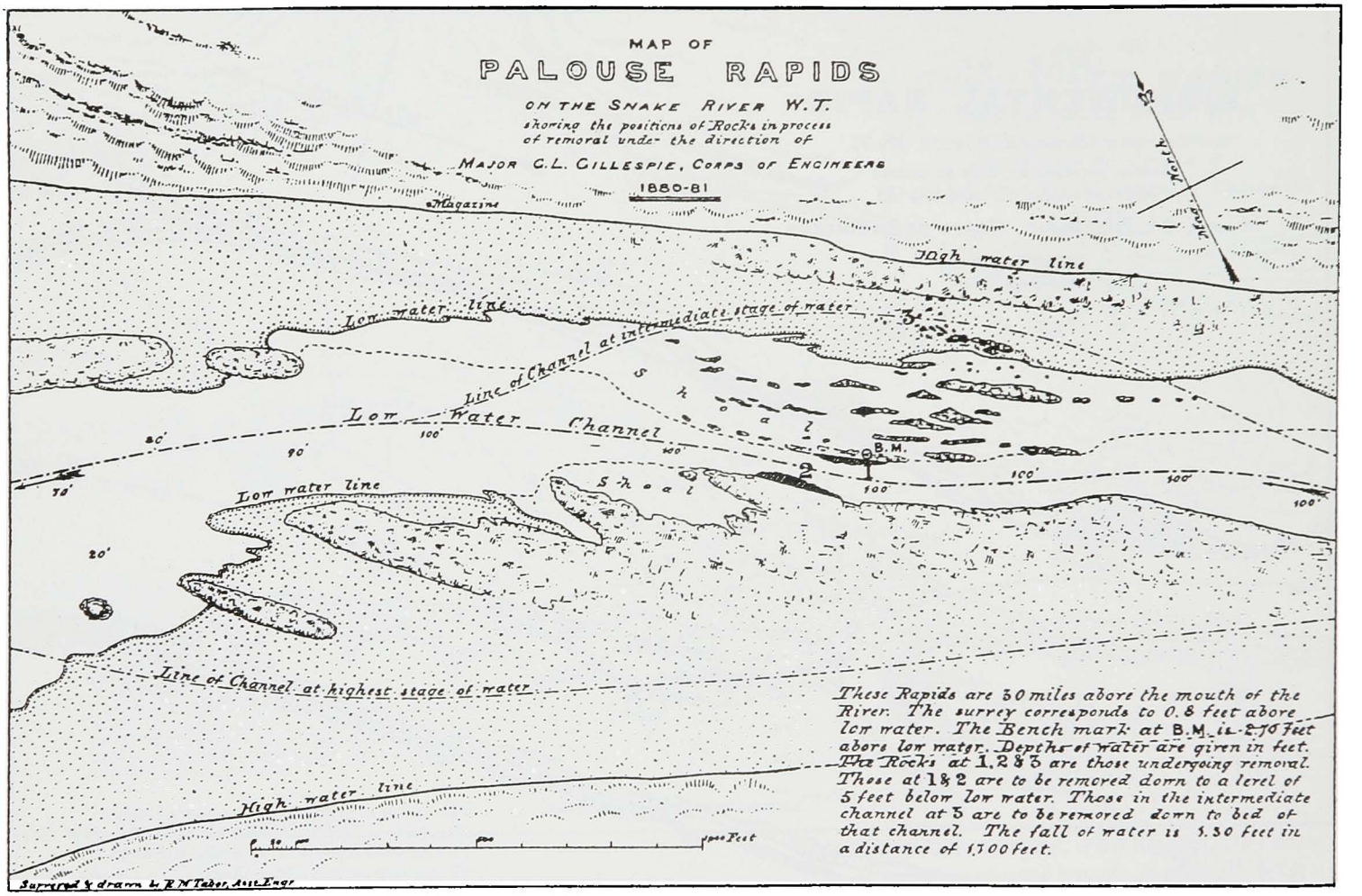
U.S. ENGINEER OFFICE, PORTLAND, OREGON
To accompany annual Report June 30th 1880

G. L. Gillespie

Major of Engineers, Brt. Lt. Col. U.S.A.

Palouse Rapids *showing rock removal for channel improvement.*

from Annual Report of 1881



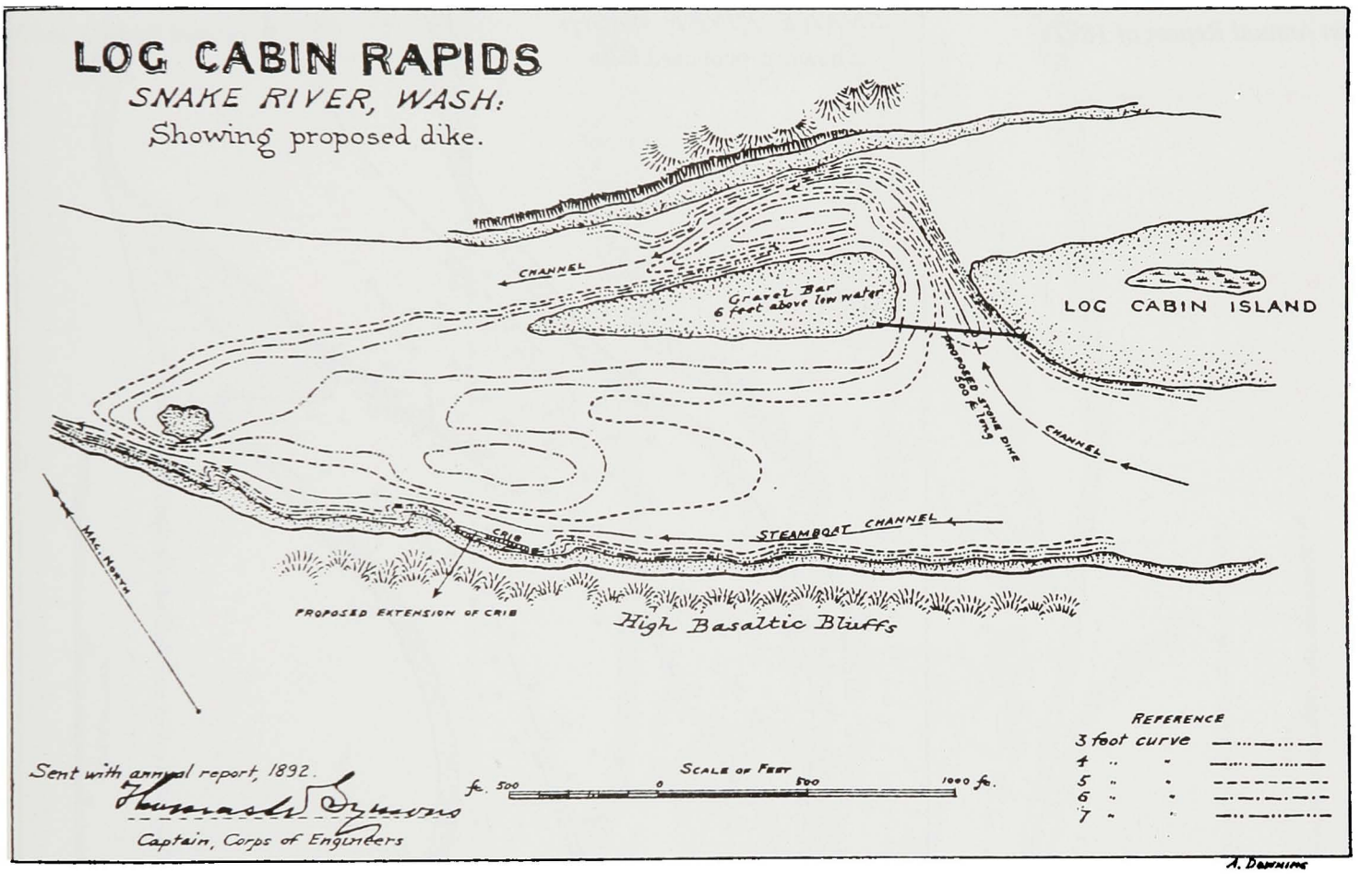
U.S. ENGINEER OFFICE, PORTLAND, OREGON

To accompany annual Report June 30th 1881

G. L. Gillespie

Major of Engineers Brt. Lt. Col. U.S.A.

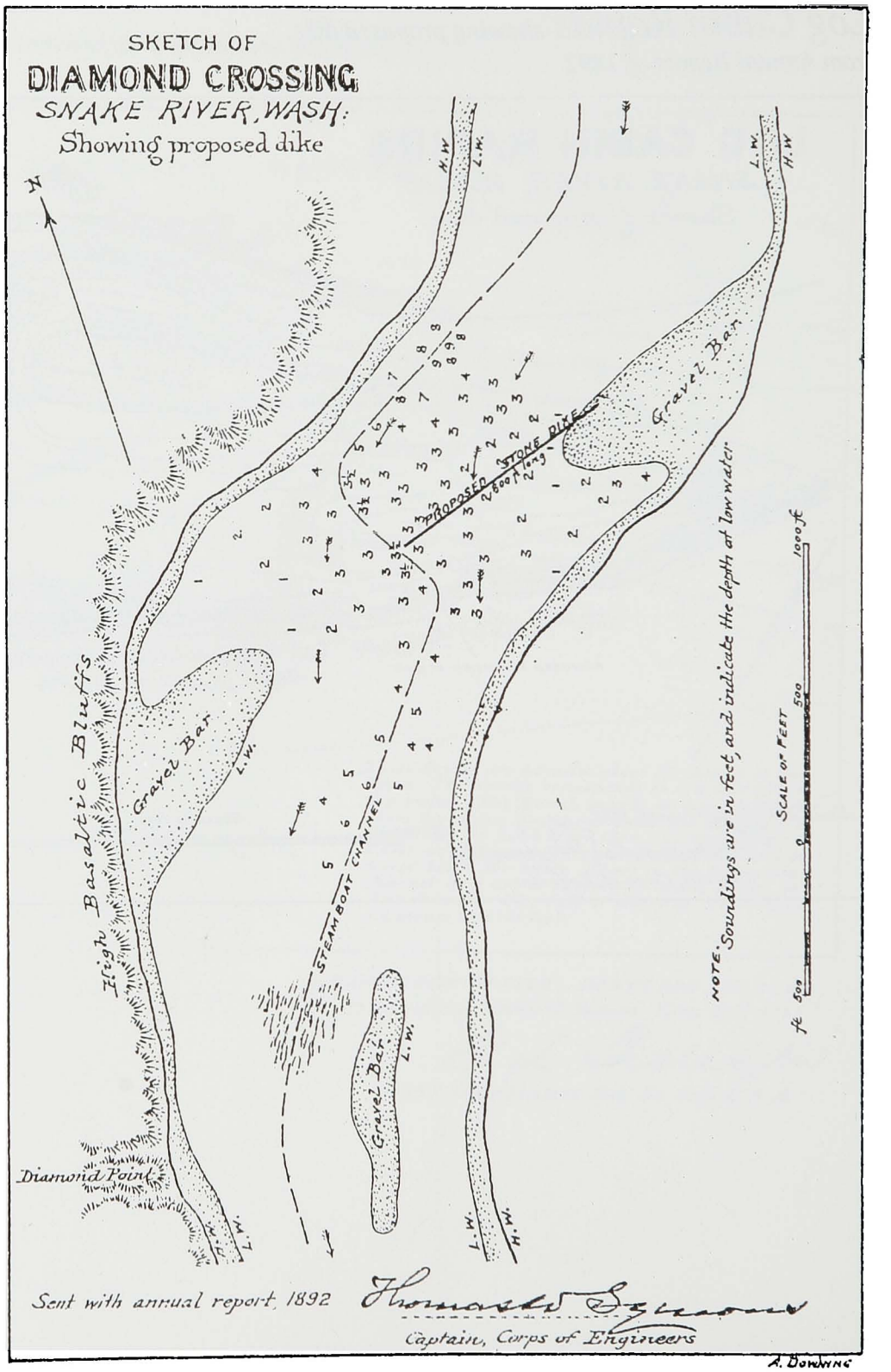
Log Cabin Rapids *showing proposed dike.*
from Annual Report of 1892



Diamond Crossing

showing proposed diking.

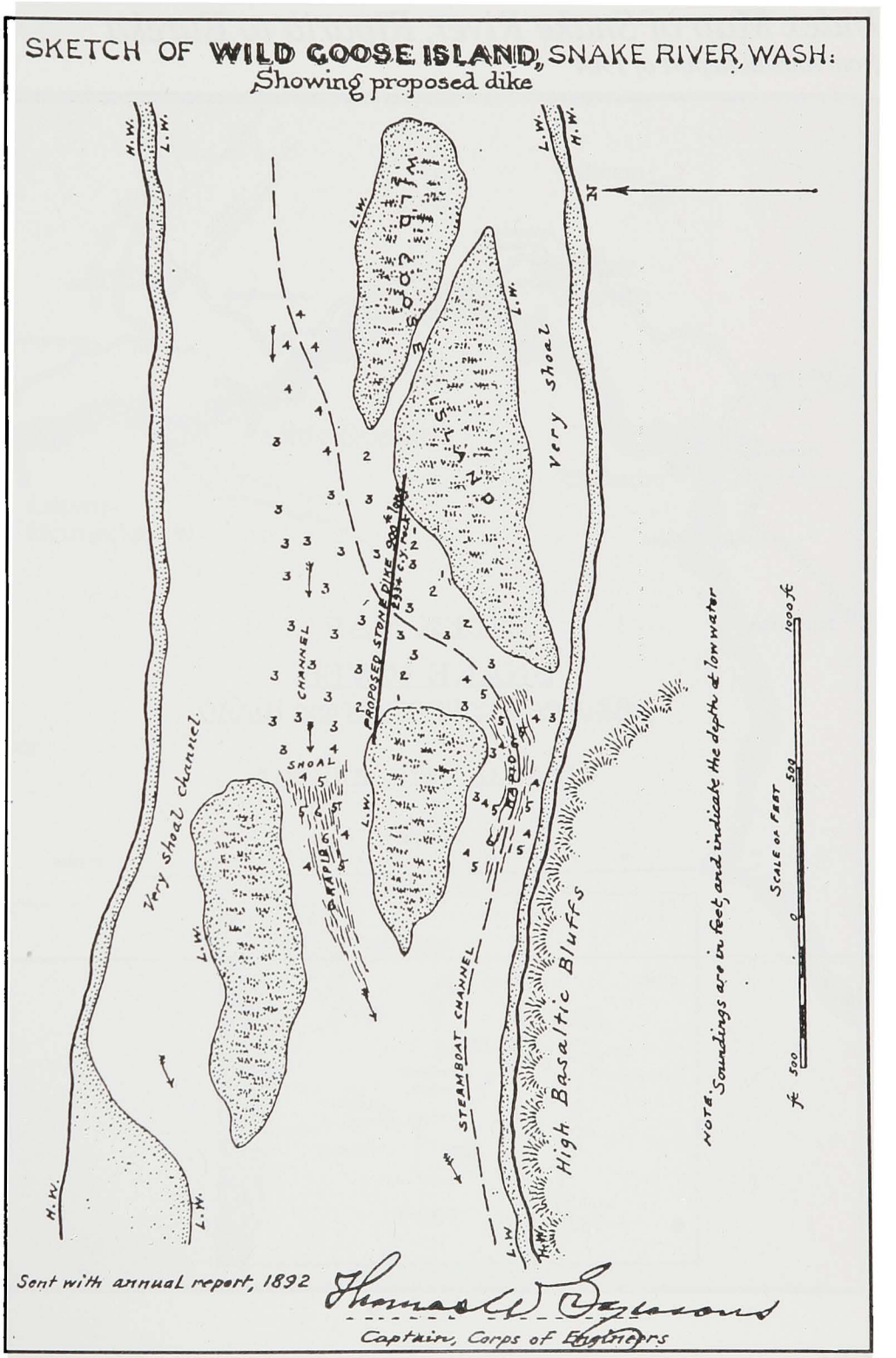
from Annual Report of 1892



Wild Goose Island

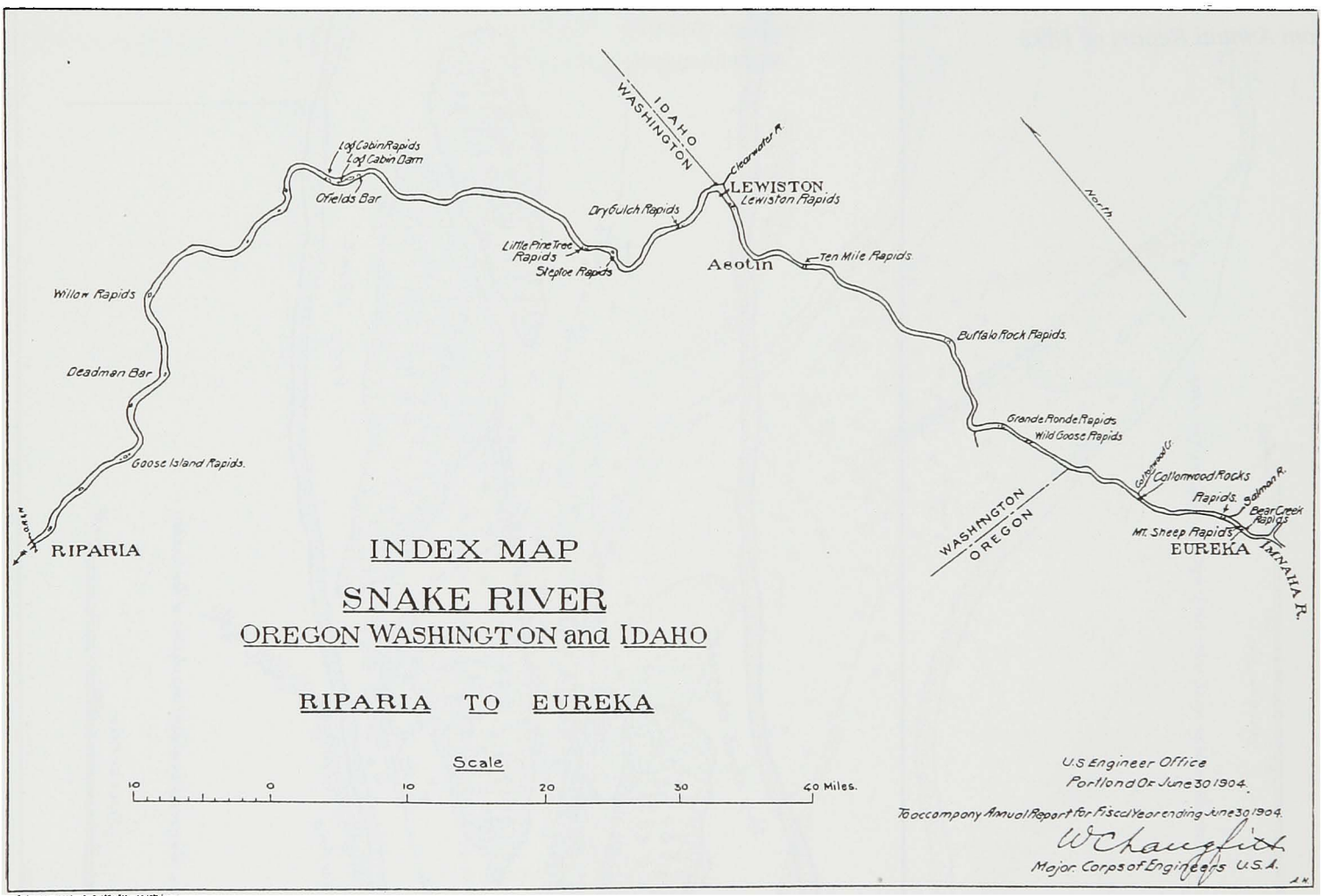
showing proposed diking.

from Annual Report of 1892

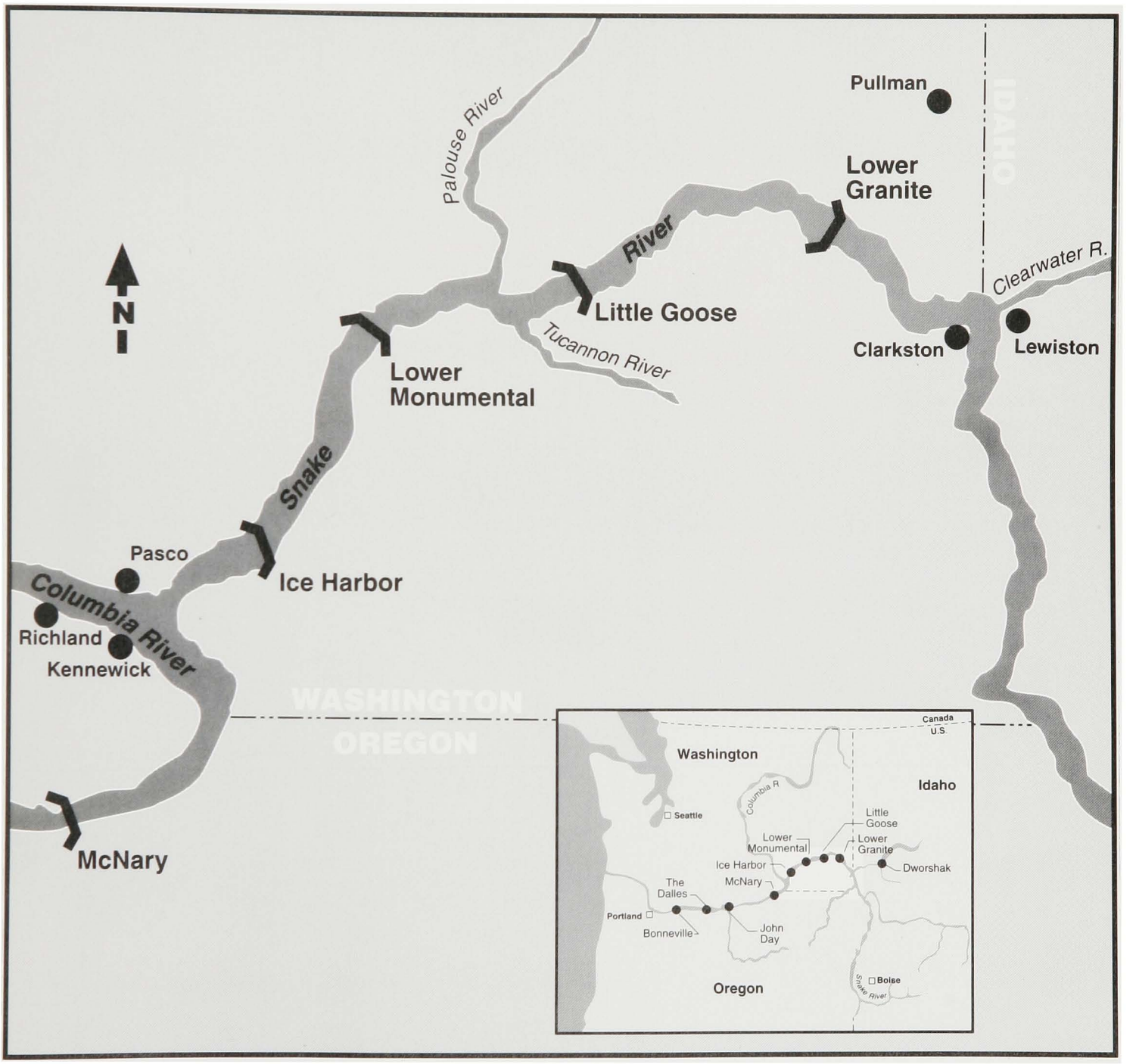


Index Map of Snake River, Riparia to Eureka

from Annual Report of 1904



Lower Snake River Project



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Walla Walla District
U.S. Army Corps of Engineers

1994