RIVER OF LIFE
CHANNEL OF DEATH
Fish and Dams on the Lower Snake

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Chronology

c. 10,000 B.C.
The last of the Missoula Floods, the greatest in geological history, destroy all evidence of possible earlier human life along the lower Snake River.

c. 8,000-9,000 B.C.
People are living in the Marmes Rockshelter along the lower Snake River; the Snake River provides an essential supply of food and water to these ancient residents.

c. 1750 Nez Perce Indians acquire horses.

1802 Congress establishes the U.S. Army Corps of Engineers.

1805 Lewis and Clark journey down the lower Snake River.

1836 Henry Spalding establishes a mission near the confluence of the Clearwater and Snake rivers.

1860 Elias Pierce discovers gold on the Clearwater River in Idaho.

The *Colonel Wright* becomes the first steamboat to navigate the lower Snake River to newly-founded Lewiston.

1861 Lewiston grows into a raucous tent city supplying goldrush miners.

1862 Lewiston becomes the capital of the new Idaho Territory.

1876 The first load of Palouse country wheat is transported down the lower Snake River by steamboat to Portland.

1896 The Corps of Engineers constructs Cascade Locks on the Columbia River as the first step in creating a year-round navigable waterway along the Columbia and Snake rivers.

1915 The Corps of Engineers constructs Celilo Canal, opening another part of the Columbia River to year-round navigation.

1930 The Corps of Engineers presents to Congress its Snake River "308 Report," outlining potential development plans for the river.

1933 Franklin Roosevelt directs the Corps of Engineers to construct Bonneville Dam on the lower Columbia River, the first Corps dam on the Columbia/Snake waterway.

1934 The Inland Empire Waterways Association is organized to lobby for an "open river" from Lewiston to the Pacific Ocean.

1945 Congress authorizes the Corps of Engineers to construct the Lower Snake River Project to bring year-round navigation to Lewiston and to generate hydropower.

1948 The Corps of Engineers establishes a new district at Walla Walla, Washington, to oversee construction of the four-dam Lower Snake River Project; the Walla Walla District will grow to supervise more construction activity than any other district in the Corps nationwide.

1952 Biologist Harlan Holmes estimates that each dam built on the Columbia and Snake rivers will kill 15 percent of juvenile salmon passing through; the Corps of Engineers refuses to publicize his report.

1955 Congress awards the Corps of Engineers first funding for Ice Harbor Dam on the Lower Snake River after ten years of effort by fishery agencies to halt construction of the project because of the agencies' concerns that the lower Snake dams will destroy Idaho salmon runs.

1961 Ice Harbor, the first of the four lower Snake River dams, comes on line.

1962 Rachel Carson writes *Silent Spring*.
Congress authorizes the Corps of Engineers to construct a dam at Asotin, Washington.

1965 Roald Fryxell finds 10,000-11,000-year-old human bones near Marmes Rockshelter on the lower Snake River, the oldest human bones ever found in North America.

1968 Idaho senators Frank Church and Len Jordan propose a ten-year moratorium on dam building on the Snake River above Lewiston.

The first barge transportation of juvenile salmon and steelhead around lower Snake River dams begins in an effort to preserve Idaho's anadromous fish runs.

1969 Congress passes the National Environmental Policy Act.
Lower Monumental Dam comes on line, flooding Marmes Rockshelter.

1970 The United States celebrates the first Earth Day.

The National Marine Fisheries Service calculates that as many as 70 percent of Idaho salmon smolts die from dam-produced nitrogen supersaturation on their way down the lower Snake River.

Conservation organizations file suit against the Corps of Engineers to halt construction of Lower Granite Dam and deauthorize Asotin Dam in an effort to preserve fish runs.

1973 Congress passes the Endangered Species Act.

1975 Lower Granite Dam completed.

Slackwater comes to Lewiston after more than one hundred years of effort to create a year-round navigable waterway from Idaho to the sea.

American Society of Civil Engineers names the Lower Snake River Project the nation's outstanding water resources achievement of the year.

Congress creates the Hells Canyon National Recreation Area and deauthorizes the Corps of Engineers' Asotin Dam.

1976 Congress passes the Lower Snake River Fish and Wildlife Compensation Plan, the largest federal mitigation effort in United States history to that time.

1980 Congress passes the Pacific Northwest Electric Power Planning and Conservation Act with a goal of giving anadromous fish equal consideration with hydropower on the Columbia/Snake river system; the act forms the Northwest Power Planning Council.

1988 Congress passes legislation prohibiting the licensing of any dam at Asotin, whether public or private.

Snake River coho salmon become extinct.

1990 One sockeye salmon manages to return to Idaho past the eight Corps of Engineers' dams on the Columbia and Snake rivers.

1991 American Fisheries Society reports that 214 salmon species in the West face extinction.

Snake River sockeye salmon listed as an endangered species.

1992 Environmentalists encourage lower Snake River drawdowns in an effort to create a more natural migration of salmon smolts; the Corps of Engineers undertakes an experimental drawdown behind Lower Granite Dam.

1993 American Rivers names the Columbia/Snake waterway the nation's most endangered river.

1994 The 9th Circuit Court of Appeals rebukes the Northwest Power Planning Council for emphasizing hydropower production along the Columbia/Snake waterway at the expense of protecting salmon.

The Northwest Power Planning Council announces an expansive salmon recovery plan for the Columbia/Snake river system.

The Columbia River is closed to commercial salmon fishing by non-Indians.

Snake River chinook salmon listed as an endangered species.

Prologue

Rivers slice through time and place. The Snake River has carved deep canyons into the landscape while it has cut through more than ten thousand years of human history. During all that time it has provided many of life's essentials for those living near it: food, water, protection, transportation, power. Studying a river like the Snake reveals much about people and place and changing times. Rivers, in other words, offer us one of our best windows to the past. 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]

It's a warm May morning at Lower Granite Dam, isolated in the Snake River canyon in southeastern Washington about twenty-five miles from Pullman, a college town of twenty thousand—the nearest population base. Iron cables and thick yellow nylon ropes fasten a tug and barge to a steel abutment just downstream from the dam's powerhouse. Like surgical tubing connecting vessel to mainland, plastic pipes wind their way through an Erectorset-like building onto the barge and snake into cargo doors. Water draining through the tubes enters watery bays on the barge and small objects appear through the clear plastic, streaming onto the barge.

These specks are tiny fish, shimmering silver in the hose's stream—fingerling steelhead and salmon in the early stages of smoltification, the period in their lives when they turn from freshwater beings into ocean

dwellers and swim in the Pacific for a few years before venturing back upstream to spawn. In a few hours the dam's fishways will disgorge slightly more than twenty tons of young fish onto the barge. At about seven to the pound, the craft will carry somewhere near three hundred thousand smolts as it sets off downstream at noon. Thirty hours later, below Bonneville Dam on the Columbia River, doors under the barge will drop open and the thousands of little fish will glide down the last hundred miles of river on their own, having taken advantage of the tug ride to bypass three hundred miles of slackwater reservoirs, thousands of predatory fish, and seven more dams on their way to sea.

It isn't hard to find humor in this situation—fish taxying downriver on a barge. A hundred years ago, millions of smolts exited to the ocean each year without artificial aid. Sixteen million adult fish annually made it into the Columbia's mouth, powering their way upstream to virtually every tributary river and creek in Washington, Oregon, and Idaho, many traveling more than nine hundred miles through some of the mightiest rivers in America, a feat roughly equivalent to swimming uphill from Dallas to Chicago. As late as the 1930s Pacific Northwesterners still told stories of spawning streams so chock-full of salmon a person could walk on their backs. But today the lower Snake and Columbia rivers are not rivers at all. They are a staircase series of slackwater pools and the young smolts—killed at dams, eaten by warmwater predators, and theatened with fatal timing dysfunctions if they fail to make it to the ocean promptly—can no longer navigate this man-made maze without help. Indeed, there is no guarantee they will survive even with this artificial taxi-barge life support system.

It would be easy to see the humor, that is, if you failed to recognize that *The Chinook*, the barge on which the fish will depart from Lower Granite Dam on this day, is a million-and-a-half dollars worth of state-of-the-art fish transportation technology, that it is only one of six sophisticated fish-carrying craft daily plying the Columbia River system during spring and summer smolt runs, and that these barges represent but a trifling percentage of the billions of dollars Americans have or soon will invest in an effort to save the Snake/Columbia anadromous fish runs.

It would also be easier to see the humor if you could ignore the people whose livlihoods await an answer as to whether the fish can be saved. There are those directly affected by each decision made about fish and dams on this river system—commercial Indian and white fishers; port employees who rely on slackwater navigation; farmers who irrigate their fields from dwindling supplies of Snake/Columbia water; aluminum

workers whose jobs depend upon a steady flow of inexpensive hydroelectricity from the dams' generators. And then, of course, there are many—many—thousands more who have come to expect the cheap power that dams provide. Indeed, were it not for the Columbia and Snake dams and the economic boom they brought during and after World War II, most residents of the region would not live here today. And indeed, it is difficult to imagine that any of the nine million dwellers of the three Northwestern states will go unaffected either directly or indirectly in the upcoming struggle to determine whether the region can have both dams and salmon. All of them either rely on the river system for power or transportation, or will be asked to foot a large part of the fish-saving bill via higher power rates and taxes.

It would be much easier to see the humor if you did not know that American Rivers, the nation's largest river conservation group, named the Columbia/Snake waterway the country's most endangered river; that the once prodigious Snake river coho salmon is now extinct; that in 1990 one Snake River sockeye salmon managed to make it back to the stream where hundreds of thousands once swam. The National Marine Fisheries Service has listed the sockeye and Snake River chinook salmon as endangered. As Steve Pettit, fish passage specialist for the Idaho Department of Fish and Game has said, these endangered species listings have the potential to make the spotted owl crises—an endangered species controversy affecting a mere thirty thousand woods workers in Oregon and Washington—"look like a pillow fight." Never has there been an environmental issue in Northwest history more widely discussed and reported, and never has there been one with the potential to impact so many people.[3]

In western Wyoming, high mountain peaks shed water into creeks with names like Fox, Wolverine, Rodent, Crooked, Sickle, and Basin. Their union gives birth to 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, the Snake turns abruptly north, forming the boundary between Oregon and Idaho, taking on the waters of 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 gorge in North America. The Salmon and the Grande Ronde enter, and the river becomes the boundary between Idaho and Washington.

The Clearwater joins at Lewiston, Idaho, 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, Washington, as the largest tributary of the Great River of the West. Before that confluence the Snake has flowed 1,036 miles (the nation's seventh-longest river), gathered water from six states, cut across a significant portion of the American West, and served as an umbilical cord, 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 begins. During its last 140 miles, this portion of the river transects some of the nation's richest agricultural country, cutting a gorge two thousand feet deep, before exiting through fertile but dry desert land near its confluence with the Columbia.

Along this stretch of the lower Snake River the U. S. Army Corps of Engineers constructed four dams and attempted to build a fifth. This book is the story of how people came to settle this region and demand such river alterations—and how some eventually came to oppose them. 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 also the chronicle, yet unfolding, of the conflict between native wildlife and dams. In microcosm it is, in many ways, the story of the American West.

Along with the three hundred thousand fish, a captain, a pilot, two deckhands, and one barge tender, I climbed aboard the fish barge *Chinook* and the tugboat *Idaho* for the ride from Lower Granite Dam, past Little Goose and Lower Monumental dams, to Ice Harbor Dam, near the Snake's confluence with the Columbia.

I have lived in the lower Snake River country for a quarter of a century. We residents of the inland Northwest depend upon the river to haul our crops to market, to light our homes, and to heat our schools. But we have, during the course of more than a century of white settlement, all but turned our backs on the river—so much so that the only way to really see it today is by boat. Except for a few isolated spots for a few isolated miles, you cannot drive along the lower Snake. You can zigzag across it at a few places—at a handful of bridges and over the four dams. But you can't drive near it for any extent of time, and this is inhospitable country for hikers, particularly in summer when the sun bakes the riprapped shore banks and the rattlesnakes come out. So, to most of us, the lower Snake remains an enigma in our backyard.

The Army Corps of Engineers, owners of the barge upon which I will travel and builders of the dams that have created the fish crisis, is likewise something of an enigma. Writers have long ignored this federal agency. The Bureau of Reclamation's role in watering the West has had the luxury of good historical syntheses.[3] But the Corps, with its influence centered in navigation, hydropower, and flood control, still awaits such 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, when Congress authorized the Corps to build the lower Snake dams, one out of every four federal dollars invested in waterways development flowed into the State of Washington, and by 1960 Washington and Oregon gobbled up nearly a third of all multipurpose water project funds. Nothing before or since transformed the region so thoroughly. Historians now call the period from the 1930s to the 1970s the "dam building era" in the Northwest. During that time the Army Engineers became the nation's largest builder and operator of hydroelectric facilities, responsible for constructing the vast majority of federal dams that remade the Pacific Northwest into one of America's most important industrial regions.[4]

The tiny fish that *The Chinook* will haul on this day are an enigma, too. If you visit a fish-viewing room at any of the dams along the Columbia and Snake rivers you might see mature salmon steadily climbing fish ladders to

spawning beds upstream. Designed by the Corps, these ladders have worked rather effectively since the 1930s. Strong adult fish can make it back home. The fingerlings those spawners produce, however, are rarely seen, and since they have always been out of sight, they have, until recently, been mostly out of mind. The Corps and various river development lobbyists convinced people that if they could get enough adults upstream, allowing them to lay their three thousand to five thousand eggs apiece, so many of their offspring would clog the rivers you could lose thousands at each dam and still retain the famous Northwest fish runs.

It was not actually a big lie, at least at first. Most Corps employees, for a considerable number of years, actually believed their own publicity releases and, instead of assisting small fish in their plight past dams, aimed instead at churning out ever more smolts at Corps-built fish hatcheries. They recognized there would be slaughter along the way. But they believed that if they released enough millions of juveniles every year they could get the relatively few adults to return upstream required to perpetuate the runs. Dam-fodder smolts became official government policy.

But as adult fish counts declined precipitously with the completion of each dam, it became apparent that this strategy would not work. So the Corps took to barging fish, and on this day I am riding on their prize barge attempting to learn more about these enigmas—the river, the Engineers, and the smolts—that seem destined to so dramatically influence Northwest lifestyles in the coming years.

Ed Ferrell, the barge tender, greets me as I walk on board. "Usually we don't have such high-priced help," laughs Cory Eagen, the tug's captain. But the Corps suffered a hiring freeze this spring; there will be no seasonal help to tend the fish barges. So the Engineers asked for volunteers and big Ed Ferrell—overweight in a T-shirt full of belly that hides his belt buckle, but with the massive, tatooed arms of a man who has long labored hard—signed up.

Ed Ferrell is the quintessential but often overlooked Corps employee. Although Army officers head the agency, civilians make up more than 98 percent of the Corps' work force, and for the most part they are civilians who take great pride in their work and have a tremendous loyalty to their agency. A good many are even environmentalists, and while Ed Ferrell might not describe himself as such, anyone observing the gentle way this

mountain of a man handles tiny fish would know he had environmental instincts.

"Them fish are like gold in Fort Knox," Ferrell says as he gingerly scoops a dead one from the top of a holding tank as we get underway. On his previous trip he carried eighteen tons of smolts and tallied 360 "morts," as tenders call dead fish. That's an enviable survival record. But as I watch Ed dip a handful of mortalities from the tanks and toss them overboard, I know each dead fingerling hurts. Ed would like a perfect run. He would like to go the distance from Lower Granite to Bonneville without a single mort.

Ferrell has already made five round trips on the fish barge this spring. "I love it," he says. "The wind and sun. Every trip you see coyotes and deer. And I love the idea of saving fish. They're the most important thing on this boat."

Ferrell started navigational construction in 1956 on the St. Lawrence Seaway. He worked dams in Oregon, Colorado, Idaho, and Venezuela. In 1970 he began construction at Lower Granite. "I started out here shootin' dynamite," he says. "Then I poured concrete. Once we got the dam built, the Corps hired me. I've been here since. I know her from the bottom to top. They call me 'Mr. Lower Granite.' I'm just like part of the furniture." A utilityman, he speaks proudly of the concrete plug he helped lay across the river. "It's a beautiful dam," he says. And it is. "That's nicer concrete than any other dam on the river."

Ed Ferrell seems to perfectly embody the clash between the two myths in the Northwest that are primarily responsible for the current controversy over fish and dams.

First, there was the myth of the salmon, fish dating back thousands of years—exactly how far back, no one really knows. But at least eleven thousand years ago people lived along the lower Snake and Columbia and thrived largely because of the rivers' tremendous salmon bounty. Salmon were to the people of the Northwest what buffalo became to the people of the Plains, and the rituals and stories and myths about the salmon—the first salmon ceremonies and the salmon feasts—played pivotal roles in their lives.

When whites came to live along the rivers, they, too, developed their own rituals about abundant salmon, basing much of their lifestyle upon the dependable return each year of silvery hordes. The oral traditions of Columbia River commercial gillnetters ring with their own adherence to salmon ceremonies.

"It was a celebration—the fishing was a celebration," recalled one. "Every night there was a send-off. There was a party. The sun was starting to set and the men would climb down the ladders and the wives would be there and the children. The boats would take off. Then the wives would haul the lines up and then head back to the bunkhouses and light the lamps and wait to hear the sound of the hoist."

The daughter of a commercial fisherman remembered her family's version of a first-salmon feast: "My dad—the first salmon he'd catch, he'd bring it home and invite the whole neighborhood in and we would have a salmon feed. We'd slice it up in slices and it was usually a great big salmon. That's all we'd have is bread and butter and salmon and milk and coffee."[5]

The myth of the salmon grew as more residents moved to the region and began angling the rivers and streams for sport, teaching the skill of landing the big fish to each succeeding generation. The fighting spirit of the fish, their strength and endurance and ability to surmount astronomical odds as they fought their way upstream to the very gravels of their birth to spawn and then die, came to symbolize, more than any other natural resource, the spirit of the Northwest.

The only manmade artifices that could challenge the salmon allegory were the dams the fish had to battle to survive. The big federal dams that transformed the Northwest—Grand Coulee and Bonneville and all those that followed—came just when the region, like most of America, was suffering its worst years during the Great Depression and beginning to question its traditional beliefs. Then along came Franklin Roosevelt and millions of dollars of federal money and massive projects to dam and tame the nation's most powerful river. And all this created a new and powerful lore. The dams put thousands of people to work and, as folksinger Woody Guthrie wrote, their power turned the darkness to dawn. New generations of Northwesterners now proudly visited and took their children to view these wonders of the engineering world. The dams reaffirmed people's faith in their ability to transcend hard times. And the cheap power the dams produced invited more industries and more people to pour into the region, and those people, too, came to believe in the myth of the dams to eternally provide the good life. And, of course, it wasn't all mythology. Columbia River dams today generate enough power to keep sixteen Seattles lit all year long. Each of the four lower Snake dams produces all the energy needs for a city the size of Portland.

But very early on these two primal myths, salmon and dams, clashed. There is another myth, fostered by historians among others, about how

people believed the resources of the West were "limitless," that we would never run out of good land to farm and big trees to cut, and that the rivers would always run full of fish. The exploiters of natural resources, of course, encouraged this parable. But people who came to extract the resources of the Northwest, including decision makers in agencies like the Corps of Engineers and the Bonneville Power Administration (which hired Woody Guthrie to write his sanguine songs about the Columbia) recognized the limits of salmon. They tried to mask their knowledge in reassurances that the region could have both cheap electricity and abundant fish, but from the time the first Columbia River federal dam at Bonneville went into operation they knew the tremendous slaughter these obstructions would bring. The federal government—and the people of the Northwest, if truth be told—at that point, in the depths of the Great Depression when Franklin Roosevelt came to offer hope and work, opted for development and dams over fish.

To say that most people in the 1930s and 1940s—including most employees of the Corps—still genuinely believed you could have both fish and dams would be true. But to say decision makers in the federal government failed to recognize that dams threatened the salmon runs would be a lie. Long before dignitaries unearthed the first shovelful of dirt to begin construction at Bonneville and Grand Coulee, fish biologists had a very good idea of exactly what would happen to the salmon, and they had loudly brought their concerns to the Corps. These biologists of the 1930s and 1940s painted a scenario of gloom that proved remarkably prescient.

And certainly by the time the Corps came to construct its dams along the lower Snake, both Engineers and fishery agencies recognized the difficulty this series of four obstructions would bring. All rhetoric about "limitless resources," and "we didn't know the problems dams would cause" to the contrary, we did make a conscious choice of dams over fish. Today we are attempting to modify that decision because the myth of the salmon proved more potent and enduring than river developers had imagined, and because a new generation of Northwesterners believes it is essential to find some balance between human development and nature.

The relative influence of the two myths changed over time. What started at Bonneville for the Corps of Engineers ended at Lower Granite. At first, as the Corps brought power to the land, the Engineers represented a symbol of hope and a brighter destiny. By 1975, when the agency completed Lower Granite on the Snake, things had changed. Bonneville, along with a couple of other famous federal dams of its vintage—Hoover

and Grand Coulee—symbolized the promise big dams held for the future. Completed at a time when people grew increasingly concerned over the environmental consequences of dam construction, Lower Granite symbolized what most observers believe is the end of the big-dam era in America. The dam-building era in the Pacific Northwest was brief— spanning barely more than four decades—but it was dramatic, and people in the region will live with its consequences, both positive and negative, for many generations.

While the dams generally brought people flocking to the Northwest, they had just the opposite effect along the lower Snake. With the exception of its two population bases anchoring either end of the lower Snake—Lewiston, Idaho, (26,000) and Pasco, Washington, (24,000)—this is one of the few places in America where fewer people dwell today than before Columbus sailed from Spain. In the late nineteenth and early twentieth centuries, some whites took residence along the river, at the former seasonal homes of Native Americans. But the reservoirs flooded nearly all the habitable bottomland, and the term "sparsely populated" hardly does justice to describing the area's solitude. Like much of the West, the lower Snake River country, meagerly populated but productive, has always been a land of export. Today wheat and hydroelectricity are its most important commodities. 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 those 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. One cannot understand this region's local history without taking into account the influence and intricacies of national and international markets and politics.

Where, in 1805, Meriwether Lewis and William Clark found Indian villages and whitewater rapids, I saw vacant riprapped river banks and not a trace of riffles. Indeed, only a Corps publicist would still characterize this body of water as a river. Locals have come to calling it "The Great Snake Lake," and it offers few of the riverine images we romanticize —brisk-flowing, cool, clear, mountain water. Today the lower Snake is a working waterway, not a Thoreauean brook.

In the past, classic dam clashes between environmentalists and developers have focused on whether or not to flood natural areas. "Save

Hells Canyon" and "Save the Grand Canyon" have rallied public opinion in dramatic confrontations.

The present battle over the Snake differs from classic river struggles because the Snake has been dammed. In that sense it is infinitely more challenging than the fights over whether or not to dam, for this struggle will tell us whether both people and wildlife can survive in an obstructed river, as agencies like the Corps have so long promised us they can.

In this sense, too, the controversy over fish and dams along the lower Snake represents precisely the type of episode historian Patricia Nelson Limerick points to when she claims that the West is now at the vanguard of American historiography. Like a growing number of "new Western historians," Limerick has spent a career disparaging the notion that nothing really exciting has happened in the West since the romanticized frontier times; that the American West is nothing but a backwater of American history, significant only because of the efforts of a few rugged individuals who came to tame the land. [6]

To spotlight rugged individuals negates the single 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 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 one can read library shelves full of Western history and literature, stories of farmers and ranchers, cowboys and trappers, towns and cities, clubs and organizations, and never find mention of the federal government. That is history in a vacuum, for it ignores the most prominent thread connecting all their diverse stories.

"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." [7]

Government power, government money, government expertise, government technology, and government bureaucracy built the modern West. Some vigorous individuals traveled along and lived beside the lower Snake. But the government, through the Corps of Engineers, transfigured the river. And the historical implications of that action far outweigh all the

individualistic acts of all the rugged people who ever set foot on its banks.

The Snake River struggle exemplifies Limerick's thesis, for at places like this in the American West, environmental battles frequently foreshadow similar events elsewhere in the United States and the world. We have constructed thousands of dams in the twentieth century, but we are only now learning how to live with them. Sacrifice has not played a very important part in the traditional telling of Western history. Pioneers sacrificed, but they expected theirs to be short-term suffering with ample future rewards. We now face long-term sacrifice if we are to save salmon. Now we have a chance to be heroic like our romanticized predecessors. We have both made and inherited messes. We can no longer just move on, as the classic Westerner disenchanted with her or his life could. There are no unfettered places left to go. It is time to see if we can clean things up in such a way that both nature and development can survive. Our era has the potential to be the most exciting and most ambitious in all the history of the American West, and along the lower Snake River that odyssey is well under way.

Writing Western history is something akin to being "a lawyer at a trial designed on the principle of the Mad Hatter's tea party," writes Limerick. "As soon as one begins to understand and emphathize with the plaintiff's case, it is time to move over and emphathize with the defendant. Seldom are there only two parties or only two points of view."[8]

That certainly has been my experience in investigating history along the lower Snake River. For example, it is much too easy to characterize the principal player in the story, the Army Corps of Engineers, as totally good or completely evil. The Corps is and has always been made up of many dedicated people, from Army generals to laborers like Ed Ferrell, who take great pride in their role in transforming a region. And as some of the world's best engineers and builders they did their transforming work well.

On the other hand, the Corps has never been as innocent as it has always maintained. It has never stood by passively doing "only what Congress wants," as it so often claims when it runs into controversy. Time and again on the lower Snake the Corps aggressively sought to influence Congress—usually to the joy of developers, such as its direct lobbying on behalf of dams; and sometimes to the pleasure of environmentalists, such as when the agency made an all-out effort to convince Congress to authorize the Lower Snake River Fish and Wildlife Compensation Plan, the largest in the nation at the time. To understand the story of the lower Snake requires the recognition of many points of view.

It also requires a long view. It is difficult with extended controversies such as the one along the lower Snake—where conservationists have clashed with river developers since the 1930s—to maintain interest in the topic. Cases drag on for years; characters change; people lose sight of the issues. It is easy to get excited over a short-term fish kill or a toxic spill. It is harder to understand the long evolution of competing forces that brought fundamental changes to this land. Our current environmental problems are not like Greek tragedies with short time frames and recognizable villains. Writers of history have an obligation to present the big picture.

The controversy over fish and dams, journalistic accounts to the contrary, did not suddenly arise when the Shoshone-Bannock tribe requested that the Snake River sockeye be listed as an endangered species in 1990. The story of this river, how it came to be and its significance to people, goes back through nearly two hundred years of white exploration and settlement, more than ten thousand years of native settlement, and millions of years of geologic formation. It is inaccurate to tell the story of Western history from a single point of view; it is equally wrong to pick up the story well past mid-stream. One goal of this book is to demonstrate that the conflict between the twin myths of fish and dams long predates anyone living today. It has roots in the ancient river inhabitants who relied upon the fish for food, and in later whites who envisioned the river—calmed and developed—as an avenue to profit.

We're a few hours into our barge run and Ed Ferrell is checking gauges on the tanks. The meters tell him the temperature and the dissolved-oxygen levels in the fish-holding areas. He closely monitors each, checking every couple of hours all the way down to Bonneville. The barge continually circulates river water via two huge valves and a pumping system that can handle fifteen thousand gallons a minute, making a complete water change every ten minutes so the tiny fish retain a feel for the smell and temperature of the river, essential branding if they are to return to this waterway upon maturity.

As we steer downstream we see wheat barges loading at grain ports and a few early-season campers at Corps' riverside recreation areas dotting the river banks. We bypass a dozen or more wildlife habitat areas the Corps maintains to attract deer and birds.

We reach Little Goose Dam at 3:20 and deckhand Rick Edmondson,

college educated but despiser of desk work, reaches for the end of a long pole the lock tender hands down, clipping to it statistics on the cargo we're carrying. He ties us up to a float on the navigation lock wall. Now inside the lock, we are trapped by stone and concrete. At the tender's command, water pours out of the lock and we begin our slow descent to the next river level, about a hundred feet below. Once we exit the navigation lock, with the dam now looming above us, we tie up to another fish-loading area and take on forty thousand more fingerlings.

Sarah Wik, a Corps biologist, oversees the fish-loading at Goose. There is no doubt that she, like Ed Ferrell, loathes morts. When one tiny fingerling flips out of a bypass pipe onto a metal walkway, Wik descends two flights of stairs, carefully picks it up, and gently places it back into the watery stream.

Sarah Wik is part of a new generation of Corps employees. Long—and still—dominated by engineers, natural resource specialists like Wik have increased in both numbers and influence within the agency since the 1960s. She greets Ferrell heartily. She's glad he's aboard: "It costs a lot of money to have permanent Corps employees tend the barges, and it cuts young temporaries out of the system. But it has been good to introduce people like Ed to what we do. I started here ten years ago, and worked just below the powerhouse and there were people in the powerhouse who had been there longer than I who had no idea what we did out here with fish. They never stopped to see what we were doing."

Forty thousand smolts heavier, we leave Little Goose two hours after entering the lock. Halfway between Goose and Lower Monumental we pass a pleasure boat, the third craft we've seen in six hours on this isolated river. We pass Lyons Ferry Fish Hatchery, one of nine the Corps built in an effort to compensate for the fish deaths its lower Snake dams caused. "When they was building the hatchery at Lyons Ferry," says captain Cory Eagen, "I hauled all the construction equipment in."

Rick prepares a mountainous dinner of chicken, salad, bread, spuds, peaches, and beans. Ed checks the fish gauges. After dinner, all hands clear the table for five-card draw. "Ten bucks worth of chips will last you an evening if you get some good deals," Rick says as I naively ante-up.

I play for a while, find $10 isn't going to last me long, and leave with Ed to check the fish again. We read his log book from earlier trips on the fish barge. "Cold, wet, windy," "cold and rain," "ten foot waves," it says. ("At ten foot waves, you can't even drink coffee," Ed tells me. "It will jar it right out of the cup.") During one April trip they searched the water

with powerful lights for a young boy swept off a pleasure boat in a big wind. No luck. They later heard he drowned.

We reach Lower Monumental Dam a little past eight in the evening; lights line the navigation lock walls. Again we drop down a hundred feet and head out downstream, the powerhouse and spillway lit like a red-and-green Christmas tree. We'll load no fish here; some day the Corps will have a juvenile fish bypass system at Lower Monumental, but not yet. Water roars through the spillway gates, all of them open this evening in an effort to flush tiny fish through the dam while avoiding the dangers of turbines. It's a relatively ineffective measure; thousands of fish are killed or eaten by predators here because there is no safe way through the dam. But fish biologists are convinced opening the spillways helps; that it is better for fingerlings to plunge down this artificial waterfall than risk virtual explosion due to drastic water-pressure changes in the turbines. So the Corps complies with their requests, despite the fact that they thus sacrifice thousands of kilowatts of hydropower as the generators lay idled for the salmon's benefit.

By 9:00 a full moon rises over the canyon and I am in the wheelhouse with Cory Eagen. "Wheelhouse" is a misnomer for this glassed-in box where the captain sits, perched thirty-two steps above the tug's deck. No wheel is in sight. Eagen leans back in a padded, swivel chair, controlling the tug with a two-inch joy stick at the end of the chair's arm, fully operated by index finger and thumb. "That moon makes it nice," he says. "With no moon you can't even see the canyon walls. It gets dark down inside this canyon." Even with the moon he frequently guides the spotlight to channel bouys to determine location.

We pass "port to port" with the cruise boat *Seabird*, but the river is quiet save for this brief activity. We reach Ice Harbor Dam about midnight and I climb up the navigation lock wall after farewells to the crew. Ed is once again out on the barge, checking gauges. "I don't sleep much on the way down," he says, "but as soon as we unload the fish and come back, I relax."

Big Ed Ferrell isn't exactly what you think of when you picture someone caring for tiny fish; nor is he the stereotypical Corps of Engineers laborer with no concern for wildlife. Ed Ferrell epitomizes the complexity of the controversy over the lower Snake, where there is seldom truly good or evil, where problems defy solutions, where money seemingly cannot buy success, where— like at the Mad Hatter's—things are not always what they seem to be, and where a waterway can be at once a river of life and a channel of death.

Chapter 9

Fish vs. Dams

Not many people lived along the Columbia River in 1861, but a few fishermen caught salmon, selling them fresh locally or shipping them smoked, salted, or canned to distant markets. By 1866 commercial canneries processed more than 270,000 pounds, and by 1880 canned salmon ranked second (behind only lumber) in Pacific Northwest exports.[1]

In those days, millions of fish made their way up the Columbia and into the Snake River and its tributaries, and commercial fishers along the Snake also prospered. William O'Brien of Weiser, Idaho, about 230 miles upriver from Lewiston, began fishing commercially in the late 1870s. Like others up and down the Snake and Columbia, he seined, using a net 350 feet long and 12 feet deep. With two other men, a horse, and a boat, he hauled the seine over the same stretch of river, time after time, day after day during the salmon season. O'Brien sold his fish to farmers, fish merchants, hotels, and restaurants. By 1894 nine other commercial fishing outfits had joined him in the vicinity of Weiser. Together they harvested more than 2,600 salmon and 4,000 steelhead that season.[2]

O'Brien was but a small part of commercial fishing operations along hundreds of miles of rivers on the Columbia/Snake system. Seine nets and fish wheels—a much more effective way of removing fish from the water—dotted the rivers, extracting more salmon than nature could supply on a reharvestable basis. By 1884 canneries along the Columbia produced more than forty-two million pounds of fish. Dependable marine engines allowed fishermen to move to the ocean in 1905 to begin sea trolling, and in 1911 commercial businesses along the Columbia processed nearly fifty

million pounds. But by then some people understood that these tremendous yields could not last. The technological efficiency had already intersected harvestable potential. As early as 1894 the United States Commissioner of Fish and Fisheries declared it "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."[3]

In 1877 Washington Territory imposed a salmon season on the Columbia in an effort to preserve the fishery. Oregon followed with similar regulations the next year. Both Oregon and Washington passed laws regulating the type of gear fishers could use. Eventually, both outlawed fish wheels, traps, and seines. Concern over salmon and steelhead also spawned a patchwork of conservation groups. But these organizations (and often-conflicting state laws) could not meet the needs of a shrinking resource.

While admitting that this hodge-podge of fishing regulations could never preserve the salmon runs, the U. S. Commissioner of Fisheries in 1885 believed artificial propagation offered a solution. Oregon developed its first fish hatcheries in the 1870s, and by the 1930s several of them operated in the Northwest. They seemed to many a technological salvation. But a new commissioner of fisheries—in 1937—challenged the praises previously lavished on artifical rearing. "How ill-founded was his faith in the all-effectiveness of [fish hatcheries] in maintaining or restoring the fisheries," wrote the commissioner about his 1885 predecessor.[4]

By the 1930s state laws, along with commercial fisher's own restraint, had eased the over-fishing threat to anadromous fish. Environmental degradation of fish habitat had become a much more serious problem. Still, throughout the latter part of the twentieth century, commercial fishers remained the purported bogeymen. In particular, representatives of the Corps of Engineers, the Bonneville Power Administration, and other dam and hydropower advocates who long refused to acknowledge their own complicity blamed commercial fishers for ever-dwindling fish runs. These continuing accusations came despite strong evidence that by 1938 (the year Bonneville Dam went on line) fishers took from the river only what nature could replenish. That is, by 1938 it was clear the fish could survive if they only had to deal with commercial fishing. Still, laws and regulations continued to squeeze commercial fishers and distract attention from other, more serious fish-killing practices. In 1938 commercial fishers could work the Columbia River 272 days of the year. By the 1990s they could fish the Columbia for a couple of weeks in February, occasionally for a few days in August and September, and two or three days a week in October. In 1994 the river was completely closed to commercial fishing. And yet the fish runs deteriorated. "After fifty years of cranking down on harvest, you'd think we'd have some results," complained commercial fisherman Kent Martin in 1992. "We need to look a hell of a lot less at harvest and much more at habitat."[5]

Indeed, Northwest fish habitat was by then a mess, and commercial fishers were blameless. Agriculture destroyed fish-rearing grounds by polluting streams with animal wastes, pesticides, and herbicides. Soil erosion—from inappropriate farming methods—buried spawning beds. Altering stream channels and siphoning off water for irrigation dried up spawning gravels. Over-cutting trees close to waterways increased sedimentation and erosion while raising stream temperatures. Gold dredging destroyed spawning beds and flushed sediments downstream to bury other spawning areas. Temporary dams installed to divert water for placer mining characteristically went up without fish ladders and sometimes completely destroyed tributary runs of anadromous fish. Domestic and industrial pollution killed fish.[6]

Still, the fish—strong and adaptable—could have survived both the degradation in habitat and the pressures from commercial fishing. What many could not survive were dams—the big dams and little dams that mushroomed across the Northwest. By the end of World War II more than three hundred dams filled the Columbia River Basin—only two, Bonneville and Grand Coulee—having been constructed by the federal government on the Columbia main stem. Most of these were tiny splash dams and irrigation diversions. Along the Snake River, however, some larger structures proved more worrisome. Swan Falls Dam, constructed and expanded over a period of years in the early 1900s, rose without a usable fish ladder and destroyed a considerable portion of the upper Snake River fish runs. In the 1950s Idaho Power Company's three-dam complex in the middle Snake blocked access to an extensive habitat for chinook and sockeye salmon and steelhead. Idaho Power attempted to install fish-passage systems at the dams but bungled the efforts, thus destroying some of the Snake River's premier fish grounds. By the early 1950s, even before the Corps began constructing Ice Harbor Dam, half of the original spawning habitat for anadromous fish in the Columbia River system had been destroyed or blocked.[7]

Clearly, the Columbia River fishery was a resource in trouble before the

federal government began its major dam-building program along the Columbia and Snake rivers. But fishery experts knew the situation would only get worse once the Corps began constructing massive multipurpose projects.

Those big federal dams, even when equipped with fish-passage facilities (and some, like Grand Coulee, were not), can deplete fish runs in many ways, not all of them apparent in the 1930s when work started on Bonneville. Reservoirs can flood the shallow gravel beds fish use to spawn. Smolts migrating downstream can be killed in turbines or, if they survive, can arrive below a dam stunned: easy prey for seagulls, squawfish, and other predators. Fish flushed over spillways to reduce turbine mortality might succomb to increased nitrogen supersaturation. Stressed too much while passing over spillways, fragile young salmon also become susceptible to bacterial kidney disease, a serious killer. Upstream migrating adults sometimes cannot detect fish ladder entrances, and even if they do, they usually spend more time in the river than in pre-dam days, all the while subject to more stress, more disease, more pollution.

Even those fish that survive face the threat of timing dysfunctions. Approximately 50 percent of the Columbia River's chinook salmon and steelhead populations originate in the Snake River system. With the completion of Corps of Engineers dams along the Snake and Columbia, a trip that formerly took an Idaho smolt about twenty-two days from its Salmon River birthplace to reach the ocean had increased to fifty-four days. Delays in getting to the sea frequently 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.[8]

Dam-caused fish mortalities became depressingly clear over the years. Annual adult counts of chinook salmon over Ice Harbor Dam declined from 94,301 during the first year of operation in 1962 to 23,175 in 1991. Sockeye dropped from 1,118 in 1963 to 1 in 1992. Snake River coho became extinct in the 1980s. It is impossible to accurately estimate the number of salmon in the Columbia system prior to the incursion of white settlers, but scientists believe at least sixteen million adult fish annually entered the river. That number had dwindled to fewer than two-and-a-half million by the 1990s, all but about three hundred thousand of those being artifically reared in hatcheries. And while fish agencies continued to squeeze commercial fishers, limiting seasons and catches, no knowledgeable observers by then really questioned the principal culprit: federal dams killed far too many juveniles. Wrote Wesley Ebel of the National Marine Fisheries Service, "The drop in adult return percentages reflects losses of juveniles due to fish passage problems in the Snake River—not to adult losses at dams, nor to ocean mortality, nor to increased fishing pressure in the ocean, nor even to the river gillnet fishery."[9]

To continue basing primary blame on habitat degradation from logging, farming, and urbanization, or on commercial fishers, as the Corps of Engineers, Bonneville Power Administration, ports, and sports fishing organizations often do, only obfuscates the issue. Habitat improvements could still help the fish. But by the 1990s fishery biologists had ably demonstrated that federal dams accounted for more than 95 percent of salmon losses on the Snake/Columbia system. Of course biologists had known that for years. But for decades the considerable political clout and public relations ingenuity of the Corps and BPA effectively delayed action aimed at addressing the real problem—dams. This delay, for which the Corps, BPA, and their political allies are largely accountable, destroyed several species of Snake/Columbia river anadromous fish and jeopardized others.

As early as the 1930s the federal government recognized that its dams killed fish and wildlife, and it began legislating a plethora of regulations to ameolorate the problem. Federal laws, however, did nothing to solve the essential problems created by dams. At best the laws only delayed the day when entire species faced extinction.

Through the 1936 Fish and Wildlife Coordination Act and its 1946 and 1958 amendments the Corps became involved in mitigating losses its dams inflicted. But the acts helped little in preserving Columbia River fish runs. As the Corps' Edward Mains wrote, "The Fish and Wildlife Coordination Act is a relatively complex law, and is subject to various shades of interpretations by reasonable men." The Corps' decentralized structure allowed it considerable autonomy in interpreting such laws from district to district. Not surprisingly, adhering to the act's provisions "ranged from good to fair, to too-little too-late, to none," noted the Pacific Northwest Regional Commission. After all, the act and its amendments required only that fish and wildlife be given "full consideration." In practical terms the Corps could accomplish this—and frequently did—by simply appending state and federal fish agency studies to their reports to Congress. If Corps decision makers at either the district, division, or national level opted to

exclude suggested fish-protection measures, they almost invariably retained enough flexibility to legally do so. Of course, these same vague guidelines sometimes permitted Corps decision makers concerned about environmental protection to justify greater fish protection than the original authorization intended.[10]

Though ushered in with great hopes, the National Environmental Policy Act (NEPA) of 1969, like the earlier Fish and Wildlife Coordination Acts, proved vague enough to allow the Corps to adhere to the letter of the law while ignoring its intent. In 1980 Congress passed yet another act designed specifically for the Columbia River system, one that seemed guaranteed to aid anadromous fish. Indeed, many considered the Pacific Northwest Electric Power Planning and Conservation Act the most ambitious effort in the world to restore fishery resources.

In 1979 the National Marine Fisheries Service had considered protecting some varieties of Columbia River salmon under the Endangered Species Act. Concerned that such designation would remove the salmon issue from regional control and wreak economic havoc, Northwest congressional leaders persuaded Congress to instead pass the Northwest Power Act, giving the Bonneville Power Administration authority to protect, mitigate, and enhance fish resources affected by hydroelectric projects. At the same time the act required the BPA to ensure that the Pacific Northwest retained "an adequate, efficient, economical, and reliable power supply." Indeed, aluminum companies' continued requirements of cheap electricity were as important in getting Congress to pass the act as were concerns about salmon. Just how the BPA was to allocate water for these two sometimes-conflicting goals would be greatly debated in the 1980s.

The measure created the Northwest Power Planning Council. The council, a multi-state agency with two governor-appointed representatives each from Montana, Idaho, Washington, and Oregon, is charged with establishing equity among the Columbia system's myriad users and for doubling the number of salmon in the river, from 2.5 to 5 million. Its very composition seemed to doom the council to failure. Representatives from Montana, for example, frequently shared little with downstream interests in Washington and Oregon. "They have something to gain if they're successful [at increasing fish runs], but we don't have a salmon run to return," commented one of Montana's members in the early 1990s. Consequently, Montana skeptically viewed proposals to drain water from its system in order to assist juvenile salmon. Further, the council never

developed a way to meet its twin obligations of increasing fish runs while retaining the region's supply of inexpensive hydroelectricity. In the words of outspoken council chairman Ted Hallock in 1991, during its first decade the council was "totally dictated to by the power industry." For ten years it focused on trying to increase fish stocks in ways that would have little or no negative impact on hydroelectric generation, primarily through expansive fish hatchery production. The council paid little attention to "the things that were killing the fish." By 1992 the council had proven ineffective at augmenting salmon runs. Even more worrisome, many biologists claimed its insistence on producing more and more hatchery stock brought drastic reduction in wild fish, which had to compete with the new hordes for food and habitat. Noted R. Keith Higginson, Director of Idaho's Department of Water Resources, former Commissioner of the Bureau of Reclamation, and hardly a rabid environmentalist, "The Power Council has been around for over a decade, spent about $2 billion, and the fish runs are still going to Hell." In 1994 the 9th Circuit Court of Appeals also strongly rebuked the council's efforts on behalf of fish: "Rather than asserting its role as a regional leader, the Council has assumed the role of a consensus builder, sometimes sacrificing the act's fish and wildlife goals for what is, in essence, the lowest common denominator acceptable to the power interests."[11]

The problem with all of these well-intentioned laws was that the Corps could act legally and the fish would still suffer. The provisions either did not directly affect the agency or were written broadly enough that the Engineers could technically fulfill their legal obligations without really improving the fishery resource. Further, fishery advocates and environmentalists found the agency unwilling to allow any tampering with ultimate control over "its" dams. For years, and to some extent today, the Corps' view was, "These are our dams and we'll operate them as we see fit." And the agency proved just as adamant about relinquishing control over the fish that happened to swim past their structures. When Oregon Senator Charles McNary in the 1930s advocated splitting management at Bonneville Dam between the Corps and a proposed Columbia River Administrator, the Corps opposed the recommendation 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, when some critics wanted state fishery agencies given ultimate authority over fish runs, 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.[12]

A further difficulty arose because the Corps acted at once as several bodies operating largely independently of each other. Dealing with the agency was like trying to squeeze a ball of mercury. There was seldom a single set of rules for "The Corps." While the Office of the Chief of Engineers in Washington determined general policy, it left execution to its division and district personnel. In the Northwest, for example, three districts—Walla Walla, Seattle, and Portland—operated under the North Pacific Division, which operated under the Office of the Chief of Engineers. Environmentalists frequently complained they never knew how such a decentralized agency made decisions. Not only did similar environmental arguments and tactics fail to work from district to district, but often the rules changed dramatically within districts because the Corps brought in new District Engineers every three years, and a new District Engineer could bring with him a whole new set of allegiances. During the period of planning and constructing the lower Snake River projects, for example, the Walla Walla District had eleven District Engineers, some of them quite sympathetic to fishery concerns and some who could hardly be troubled by such matters. It made a great deal of difference under whose watch fish preservation proposals made their way to the District's headquarters.

Despite its decentralized nature, the Washington, D. C., office never gave districts complete autonomy, and residents of the Pacific Northwest—including some Corps employees—grew frustrated because local Corps officials frequently sought to do more for fish than the Corps' upper echelons would allow. Longtime Walla Walla District biologist Ray Oligher recollected some of that frustration when recalling his trip to Washington, D. C., in the mid-1970s to advocate on behalf of the Lower Snake River Fish and Wildlife Compensation Plan, the most expensive mitigation proposal in American history to that time: "We spent two days in Washington and it was a tough sell. There was only one biologist in D.C. at the time. They were 3,000 miles away from the issue and they were money handlers who could care less about salmon."[13]

In 1988 a frustrated Norma Paulus of the Northwest Power Planning

Council alleged that the Washington, D. C., office had "declared war on fish." Indeed, Army Engineers in the East frequently were less sensitive to fish problems than those in the Northwest. Director of Civil Works Major General H. J. Hatch wrote the North Pacific Division in 1987 that he was "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 Washington Office of Environmental Overview toured fish facilities along the lower Snake that same year and chastised Walla Walla District officials, noting that the Corps' Washington officials had questions about "when enough is enough." He reminded District personnel that the Corps' primary concerns were flood control and navigation and that the "environmental- natural resources program with the U. S. Army Corps of Engineers" had "a limited visibility and a low priority." He also expressed concern about the many arrangements between the North Pacific Division and various fish and wildlife agencies to preserve fish runs.[14]

Anadromous fish returning to the Snake River in the late twentieth century faced a dammed channel of death, a potentially unsolvable problem exacerbated by conflicting authorities and ineffective federal laws. In the period from the 1970s into the 1990s the Corps of Engineers and other state and federal agencies pumped hundreds of millions of dollars into fish preservation efforts while maintaining the dams at peak operating efficiency for electrical production, navigation, recreation, and irrigation. Nowhere in the world had society spent anywhere near as much money to preserve fish runs as on the Columbia River system. Despite all that money, the fish continued to die. The experiences along the Snake and Columbia rivers proved only one thing: the legislators who passed the Northwest Electric Power Planning and Conservation Act hoping to avert a potential economic crisis brought by an endangered species listing were living a pipe dream. It would prove impossible to have low hydroelectic rates, free navigation, and viable fish runs in the Columbia/Snake waterway.

One could take the case of the Lower Snake River Fish and Wildlife Compensation Plan as a perfect example of a noble federal program underachieving its expectations. There is no doubt the compensation plan, at one time the largest federal mitigation program in American history, has helped to buy time in the struggle to preserve fish and wildlife. But it has

not become the panacea many had hoped. The Corps of Engineers has spent more than $220 million, plus an estimated $10 million annually in operating expenses, to compensate for fish and wildlife losses its dams caused along the lower Snake. Ninety percent of that money financed fish mitigation measures. But it will take more than a multi-million dollar compensation program to preserve the fish and wildlife threatened by those lower Snake dams.[15]

The condensed history of the Lower Snake River Fish and Wildlife Compensation Plan is this. 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 suggesting ways in which the Corps could compensate for lost resources. Fish and Wildlife completed reports on the first three dams, but by 1966 the Corps believed the anticipated costs for project-by-project mitigation were too high. So the Corps asked the agency to furnish a single report on the four dams as a unit.

In 1971 the agency completed its assessment. The Walla Walla District provided comments, and Fish and Wildlife submitted a final compensation plan in 1972. During the next few years the Corps held a series of public meetings concerning the plan, revised it again, and 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, just one day short of a pocket veto, President Gerald Ford signed the act into law.

The bill authorized $58.4 million—a figure later dramatically increased—for mitigation on the Snake. It called for the acquisition of 24,150 acres of wildlife habitat and fishing and hunting access, as well as the construction of nine fish hatchery complexes.[16]

The real history proved much more complicated than this summary. In the 1970s the Walla Walla District came to support the concept of lower Snake compensation, aggresively making the case for mitigation before sometimes-reluctant Corps officials in Washington, D. C. The District, however, had not always thought highly of paying millions of dollars to atone for fish losses, and in the late 1960s some fishery agencies chastised the District for proceeding too slowly.

"We were changing things," the District's Willard Sivley recalled 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. That we preserved fish runs at all is something of an environmental miracle."[17]

Sivley landed his first job at the Walla Walla District in 1950. He worked through the ranks and eventually served as chief of the engineering division from 1973 until he retired in 1980. Recognizing the importance of fish and wildlife and the Corps' increasing responsibilities toward them, 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 became one of the primary molders of the Corps' lower Snake compensation plan. Joining him 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 feature any staff biologists in those days, let alone two, and certainly it was rare for a district to send an engineer to school for a degree in natural resources. "I think Walla Walla District was pretty progressive in terms of the environment," Sivley recollected.

In the late 1960s the Corps of Engineers entered a period of transition. It moved from an agency primarily concerned with construction to one that assumed greater responsibility for preserving natural resources. The Corps hired its first biologist in 1938, but by the mid-1960s it had fewer than seventy-five natural resource personnel nationwide. Then the situation began to rapidly change. By 1972 the Army Engineers had four hundred people working nationwide in its environmental operations. That number grew to nearly five hundred a few years later—a dramatic increase, but still a tiny minority at the huge federal bureaucracy.[18]

In 1970, however, the Corps remained development oriented and frequently clashed with fish and wildlife agencies over their respective responsibilities. The North Pacific Division, frustrated at the delay in completing the lower Snake compensation report, blamed the Fish and Wildlife Service for the long-overdue plan.[19]

Fishery people had a different perspective, accusing the Corps of deliberately causing the 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.[20]

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 concerns about the report, especially its recom-

mendation 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 Corps would not win this argument; it would build fish hatcheries. Ironically, by the 1990s as fish biologists increasingly questioned the wisdom of so many hatchery fish competing with dwindling wild strains, the Corps could legitimately note that fishery agencies themselves were primarily responsible for the millions of fish placed in the river system annually because they had demanded huge hatcheries as a part of the Lower Snake River Compensation Plan. The Corps proved less willing to point out that its alternative had not been to attempt to improve wild runs, but merely let "nature" take its course. Doing so would have surely resulted in even more alarming fish deaths.[21]

By the 1970s, when fishery deterioration on the Snake became apparent to everyone, the Corps willingly cooperated with fishery agencies in persuading Congress to pass the compensation plan. Indeed, the magnanimity of the Corps' proposal surprised many people, both within and outside the agency. As Sivley characterized it, "When we first started talking about a $58 million mitigation program in the early 1970s, we staggered a lot of people."[22]

Sivley was unsurprised when Corps officials from Washington occasionally visited the District and "accused us of caving into local people and spending too much on fish." But even in the Northwest, some people disapproved of the compensation plan.[23]

The most expensive item in the plan, construction and operation of fish hatcheries, troubled several agencies. Virtually all costs incurred by the hatcheries had 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. Ken Billington, executive director of the Washington Public Utility Districts Association, claiming his organization was "stunned" by the project expenses, questioned whether the Corps had not sought much more compensation than legally necessary. The Bonneville Power Administration shared this sentiment. Noted BPA 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." With the destruction of fish by now clearly apparent, however, neither the Corps nor Congress proved willing to incur further wrath from Northwest residents and environmental groups. Congress would direct the Corps to build hatcheries despite objections from power marketers.[24]

The Walla Walla District ended up remodeling or building nine hatchery complexes. These were to produce more than twenty-seven million salmon and steelhead annually, the number believed necessary to insure an annual return of 132,000 adult fish.[25]

While fish received most of the publicity surrounding the lower Snake compensation issue, the plan proposed to mitigate for wildlife losses, too. The controversies involving fish hatchery construction paled compared to those surfacing when the Corps attempted to compensate for wildlife deaths caused by its four-dam project. And while it is convenient to blame a federal agency like the Corps for fish and wildlife destruction, sometimes the complications go far beyond bureaucratic foot-dragging to essential societal rifts over whether and how to atone for such losses.

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. Consequently, riparian zones are among the richest ecosystems on earth. Even in country as dry as the land through which the lower Snake River flows, the riparian community teems with life. This region looked barren and desolate to early explorers, but it always held 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 a half mile of the river's edge between Pasco and Lewiston. 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 could not simply move on when the reservoirs rose. The Snake's hardscrabble uplands offered little to entice or support such animal settlement. By 1987 Washington Department of Game officials estimated that the lower Snake supported only 2,000 game birds; that furbearing animals had plummeted from 13,000 to 500; that the 95,000 wintering songbirds formerly along the river then numbered only 3,000. The Corps would try to save some of these animals, but said mitigating for some species, particularly non-game animals, would not be "economically justified." These included lizards, snakes, mice, gophers and several other types of rodents, as well as birds of

prey such as osprey and hawks—precisely the types of species humans often consider "lower rung" and consequently frequently omit from mitigation proposals.

Of course, just as dams did not solely kill fish, the loss of Snake River riparian lands to reservoirs did not exclusively bring such wildlife losses. Other human actions—such as an increased use of toxic farm chemicals and sacrificing wildlife habitat and wetlands to development—also took their toll. But the reservoirs remained the primary culprits, and mitigating for these wildlife casualties proved to be one of the most complicated aspects of the Lower Snake River Fish and Wildlife Compensation Plan.[26]

The compensation plan called for acquiring 24,150 acres. It would be difficult to obtain that much property without getting it through condemnation, and those living near the lower Snake were not about to sit idle while the government took away their farms and ranches.

By the early 1970s the Corps had grown used to controversy regarding fish, but it had not anticipated the contention that would surround land acquisition for wildlife. Looking at the situation retrospectively, perhaps the 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."[27]

By the 1970s the United States annually lost more than six million acres of farm land to development and soil erosion. Farmers in some areas adamantly demanded that "not one more inch" be relinquished. At the same time, environmentalists clamored for fish and wildlife compensation, a conflict bound to lead to confrontation as Congress increasingly required federal agencies to mitigate despite farmers' concerns.[28]

The Lower Snake Compensation Plan proposed acquiring 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 District would purchase the chukar land; the State of Washington, with money provided by the Corps, would acquire the property for upland game and the bulk of the fishing access; the State of Idaho would buy about fifty acres of fishing access, again with Corps funds.[29]

The Corps held a series of public meetings to solicit input prior to congressional authorization of the compensation plan, and it became immediately evident that many people opposed these far-reaching measures. At a 1973 public hearing in Colfax, Washington, participants

unanimously opposed any increase in government ownership of local lands. Not only were farmers concerned about losing property, they also worried about potential problems stemming from increased hunting. At one point the Walla Walla District considered separating the fish portion of the compensation plan from the wildlife portion. Some in the District believed the fish proposals would pass Congress more easily by themselves. State fish and game agencies, however, insisted on keeping the package together. They feared that separating the two components might doom the less-popular wildlife compensation altogether.[30]

Despite the clamor, Congress passed the compensation plan. Opponents became more outspoken. They had several concerns. Many protested the loss of local property control and a resulting drop 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."[31]

Most, though, specifically denounced the Corps' right 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 via 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 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: much to the concern of local Engineers, the Corps would condemn land if necessary to obtain mitigation property.[32]

This decision brought strong protests from local residents, many of whom misunderstood the complicated Corps decision-making process and believed Walla Walla District officials had misled them. "All through the . . . hearings the people were told the . . . compensation would be done on lands acquired *only by willing sellers*," charged one. "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."[33]

Columbia County's commissioners suggested the Corps confine its

mitigation projects to existing state and federal lands. Only a minority, though, 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 fought the idea. The chief of engineers finally backed down, despite the precedent this might set. The Corps would first attempt to purchase all necessary land via the willing seller concept. It would also wait until 1983 to determine whether it needed to pare down the number of acres purchased, revert to condemnation, or find suitable alternatives, such as paying farmers to plant wildlife forage.[34]

In 1983 the Walla Walla District prepared a special report to Congress about its purchases of off-project lands, a pessimistic digest: "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 precious little progress in acquiring acreage for wildlife mitigation.[35]

Despite the setbacks, Walla Walla recommended again in 1983 that "it would be inappropriate to abandon [the willing seller] concept." The Corps and the state would try again. The Corps also agreed to acquire land only with the concurrence of county planning commissions.[36]

Most important, the Walla Walla District, in an effort to break the impasse in land purchases, made an even more significant recommendation. The Corps suspected that its biggest difficulty came from landowners unwilling to chop up farms to sell small parcels meeting the specific compensation plan requirements or to sell perpetual easements for hunting on private lands. So the District recommended that it and the Department of Game purchase entire farms and ranches, even though some land so bought 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 modification. For the first time the Corps seemed optimistic it could purchase the requisite property.[37]

Yet criticism of the Corps continued, particularly from its partner in the compensation plan, the Washington Department of Game. Bruce Smith, the department's eastern Washington regional director, suspected that Washington, D. C., Corps officials did not share Walla Walla's aim of fully implementing 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, Smith 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."[38]

Actually, the culprit was President Ronald Reagan's executive department, which the next year eliminated all money for land purchases. In fiscal year 1990 Congress gave the District $861,000 for property acquisition. The five-year clock for completing land acquisition recommended in the 1983 special report to Congress then began ticking. All land purchases had to be completed by fiscal year 1994 and some District employees still questioned the goals' achievability. "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.[39]

The Corps' problems and frustrations were many. When the District and State of Washington identified usable land with owners willing to sell, county planning commissions had to approve the purchase. Just meeting those requirements would have been difficult. But there were other problems as well. Owners frequently expected more than the land's appraised value, while other purchasers competed for the limited parcels available.

Overriding all these difficulties was a 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." As the 1990s began the Corps had only purchased approximately four thousand of its twenty-four thousand acre goal.[40]

Preserving wildlife threatened by the Snake River dams drew less attention than fish issues, but there were similarities between the two experiences. Most significantly—and not surprisingly—it became clear in

both instances that while people generally favored the concept of environmental protection in the abstract, many resented such protection "in their backyards," with personal costs involved. The same farm organizations that had fought for the lower Snake dams and benefited from the reduced freight rates they brought, now opposed the idea of surrendering property to aid wildlife or paying higher property taxes due to increased federal land ownership. Like utility users elsewhere in the Northwest, they wanted the dams' benefits and generally agreed it would be nice to save animals. When it came time to pay the bills, however, they balked. Northwest farmers, like Northwest utility users, refused to face reality. They wanted the nation's cheapest electricity, a federally subsidized navigation system that guaranteed inexpensive grain shipment, and abundant fish and wildlife. Something would have to give. As the region entered the 1990s, the only things to have given to that point were fish and wildlife.

The Lower Snake River Fish and Wildlife Compensation Plan would play a significant role in efforts to save the Northwest's anadromous fish. Grand as it was, however, fishery biologists always knew it alone would not be enough. Indeed, the compensation plan would actually be a minor part of federal outlays to save Columbia/Snake river salmon and steelhead; it would only mitigate for losses brought by construction of lower Snake dams. The compensation plan goals fell far short of restoring fish runs to their pre-dam levels, and although biologists recognized the improbability of again seeing sixteen million adult fish annually swimming the Columbia/Snake system, they wanted considerably more than were there when dam construction began on the lower Snake. Environmentalists and fish biologists increasingly demanded that the Corps and BPA do much more than merely "compensate" for losses dams caused. They concentrated their efforts on forcing the Corps to develop ways to get smolts safely past the dams.

At the time the Corps constructed Ice Harbor Dam, most public attention focused on adult fish survival. Salmon produced so many eggs that the Corps chose to ignore scientific warnings about massive smolt deaths. It believed that if its fish ladders could guarantee a significant adult return rate then the adults would produce enough offspring to insure the preservation of fish runs, even if tens of thousands of juveniles died at each dam. Consequently, Ice Harbor had fish passage only for adults; smolts had to fend for themselves.

Even though adult fish also die at dams, enough do survive to insure runs—if the dams killed fewer juveniles. As studies began to reveal the number of smolts that actually died at each dam, as well as the devastating cumulative effects of dams, the Corps came to realize it needed to improve juvenile survival rates or face the ongoing wrath of fish biologists, environmentalists, and—more importantly—Congress.

Actually, fishery agency concern over juveniles quickened with the completion of McNary Dam on the Columbia in 1954. The agencies began marking smolts, then placing them in the river above the dam and netting them below the dam in order 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," recalled Corps' biologist Ray Oligher. "But the tests did show there were deaths. That was when we got concerned."[41]

When studies found that McNary's turbines killed some of the smolts, the Corps developed safer turbines for the lower Snake dams. The studies also demonstrated a dramatic escalation in predation with dam construction. The rivers always hosted predators—birds and fish that feasted on smolts—but warm, slow-moving reservoirs encouraged even more, including several varieties introduced to the Columbia system as game fish. Salmon smolts attract predators by pooling up behind dams before moving through. "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 experimented 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 research; nowhere in the world had anyone tried anything so grand.

The Engineers had designed a sluiceway to divert ice and trash around Ice Harbor Dam. In the 1960s the agency drilled holes from the sluiceway into turbine intakes to provide access through the dam for juvenile fish. Because the dam had no fish-guidance devices, however, the smolts had to voluntarily find their way to the sluiceway openings. Further, those fish that did make it into the sluiceway hurtled past the dam so fast that some were stunned. They became easy victims for predators downstream. Even so, the sluiceway proved safer for fish than going through turbines—or over the spillway and dying of nitrogen supersaturation.[42]

The Corps did not build a sluiceway at Lower Monumental Dam, but the Engineers embedded a juvenile collection pipeline along its entire

length. Again constructed without a guidance system, the pipe proved even less effective than the converted sluiceway at Ice Harbor.[43]

Juvenile fish that did not go over a dam's spillway or through one of the rudimentary passage systems were suddenly swept down 120 feet below the surface into the turbine intake. In 1969 scientists came upon the idea of lowering huge screens into the water behind dams to deflect the young fish before they entered the turbines. They are called "traveling fish screens" because they use an endless belt of heavy nylon mesh mounted like a vertical treadmill to prevent clogging by debris. The deflectors force the fish into slots in the dam where they are guided by lighted openings to a long tunnel or channel that transports them around the deadly turbines and spillway.[44]

The screens were still experimental when Little Goose went on line in 1970, so the Corps opted for a bypass system identical to Lower Monumental and encountered similar problems attracting young fish. In 1973 the Corps installed traveling screens at Little Goose, and the number of juveniles safely bypassing the dam increased dramatically.[45]

The state of the art had changed significantly by the time the Corps built Lower Granite. 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 attracted an estimated 50 percent of salmon and 75 percent of steelhead juveniles. Lower Granite and Little Goose also featured fish-loading areas. These became heavily used, beginning in 1977, with the District's most publicized fish-passage endeavor, Operation Fish Run.[46]

In 1968 the National Marine Fisheries Service (NMFS), under contract with the Corps, began transporting juvenile fish by truck around dams on the Snake and Columbia, releasing them below Bonneville. This unorthodox "migration" lessened fish kills at the dams and delivered the tiny fish to estuaries in a timely manner. Preliminary reports indicated survival rates 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 saving fish until the Corps could construct hatcheries to produce ever more sacrificial smolts. But each year the

operation expanded, with NMFS transporting 154,000 fingerlings in 1971 and 435,000 in 1976.[47]

The year 1977 came in dry, one of the worst droughts in Northwest history. Light snowfall forced those who controlled the multipurpose dams of the lower Snake and Columbia to make difficult decisions. Power companies wanted all available water stored to meet later energy demands. Young fish, however, needed a steady water flow to help move them downstream. The Corps, fishery agencies, and power marketers reached a compromise: greatly expand Operation Fish Run. The District added a new dimension to the fish transportation system that year when it transported nearly five-and-one-half million smolts downriver by barge. In 1981 the transportation project became a permanent part of Walla Walla District operations. By the end of the 1980s the Corps freighted more than twenty million fish annually in sophisticated million-dollar barges.

State fish agencies, Indian tribes, and the Corps praised Operation Fish Run, especially in its early years, and especially in low-flow seasons. Indeed, the Corps probably spent more time and money publicizing this program than any other environmental endeavor it undertook in the Northwest, touting it as one of the agency's most innovative conservation efforts nationwide. And few doubted that transportation helped. Had it not been for barging, 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. In 1976, Wesley Ebel of the National Marine Fisheries Service enthused, "We can work wonders with this transportation system, particularly with the steelhead trout . . . It seems possible that we can establish adult runs of both steelhead trout and salmon in far greater numbers than existed before."[48]

That proved an optimistic prediction. Gradually, fishery officials criticized the Corps' over-reliance on transportation, and the program became one of the Walla Walla District's most controversial projects, pitting environmentalists and biologists against the Engineers and their navigation/hydropower allies in a long debate over the most effective way to preserve dwindling fish runs. Young steelhead did remarkably well in the barges, and the juvenile transportation program led to greatly increased survival and return rates. Indeed, the transportation system probably kept steelhead off the endangered species list in the early 1990s. By then, thanks primarily to the juvenile transportation program, steelhead populations in

the Snake were relatively healthy, at least for hatchery stock. Steelhead smolts are about twice the size of most chinook salmon juveniles, however, and considerably sturdier. Research indicated that salmon did not stand the stress of transportation nearly as well. The Corps frequently modified the system to lessen stress on juveniles, but the survival rate for young chinook never approached that of steelhead.

"We barge more and more, and fewer salmon are coming back," charged Andy Brunelle, environmental specialist in Idaho Governor Cecil Andrus's office. "It's not working." Seconded biologist and fish advocate Ed Chaney, "This is a huge scientific hoax, perpetuated by the Corps because they have become so fanatical about it. They have cooked the data. This is religion being passed off as science. But it shows how powerful groups like the Corps and BPA are. They can still have people believing these fairy tales about the benefits of barging." As Cecil Andrus's office bluntly stated in a slick brochure castigating the Corps and BPA for reliance on transporting smolts, "Barging salmon is not legally, socially, or biologically acceptable for endangered Snake River salmon." In 1993 an alliance of environmentalists, along with the states of Oregon and Idaho, brought a lawsuit against the Corps and NMFS claiming that barging actually contributed to the salmon's decline, but lost the case.[49]

Still, by the 1990s the juvenile transportation system had powerful supporters. When Governor Andrus encouraged the Northwest Power Planning Council to initiate a permanent annual drawdown of lower Snake reservoirs in an effort to flush—rather than ferry—juvenile salmon to the sea, the Corps, power companies, and navigators spoke forcefully against the measure. Consequently, despite mounting evidence that taxying simply could not insure chinook survival, no matter how many million the Corps might transport, the council opted instead to try once more to increase the efficiency of barging.[50]

By the late 1980s federal and state fishery agencies and Indian tribes had won some concessions from the Corps and its fish transportation program managers. The Engineers reluctantly agreed to "spread the risk" in high or normal streamflow years by placing some juvenile fish back into the river below dams rather than attempting to transport them all. It became increasingly apparent, however, that the rudimentary juvenile bypass systems (converted sluiceways and the like) at many Snake and Columbia

River dams simply could not insure juvenile fish survival, even in good water years. The fishery agencies advocated better, more sophisticated bypasses, but sometimes they ran afoul of Engineers who did not always share their belief in the need for better fish facilities.

With its stated goal of restoring fish runs to levels existing prior to construction of lower Snake dams, the Northwest Power Planning Council emphasized two key components of a recovery program: fish hatcheries and juvenile bypass systems. Increasing hatchery production alone would not sufficiently improve fish runs if juveniles could not make it past the dams. The council could finally see the folly of the "salmon fodder" method of producing more and more smolts in the hopes enough would survive the downriver slaughter to ensure the runs' stability. Further, the council believed bypasses necessary to protect dwindling runs of wild salmon and steelhead.

The Walla Walla District agreed with the need to modernize bypasses at two lower Snake dams, Lower Granite and Little Goose, and in 1983 began meeting with fishery agencies and tribes to determine a suitable system. All participants agreed to construct a fish flume at Little Goose. Although more expensive than traditional pipeways, flumes had been used effectively at a few smaller dams in the Northwest.

In 1985 the Corps began testing several types of flumes, but debates over the relative merits brought delays. First planned for operation in 1987, the Corps did not complete the Little Goose system until 1990. When finished, the Corps of Engineers' first fish flume was the latest in bypass technology. Huge structural-steel towers supported an outdoor corrugated steel flume nearly half a mile long, covered with a vinyl sun screen. Now, rather than a dark, rapid trip through pressurized pipe, young fish flowed at the speed of a natural stream in sunny light. The bypass cost $9 million and the Corps proudly unveiled it during international festivities surrounding the twentieth anniversary of Earth Day.[51]

The Northwest Power Planning Council also wanted the Corps to upgrade the system at Lower Granite and construct new bypasses at Lower Monumental and Ice Harbor. Although the Corps agreed with the improvements for Granite and, eventually, Monumental, the Engineers insisted that an expensive bypass system at Ice Harbor was economically unjustified. Their resistance touched off a heated confrontation over the best way to preserve Northwest fish runs.[52]

According to the Corps, the Lyons Ferry Fish Hatchery, constructed as part of the Lower Snake Compensation Plan and located upstream from

Lower Monumental, made a new bypass and collection facility at that dam economically feasible because the system could capture millions of smolts entering the river at that point. No smolt-producing streams enter the Snake between Lower Monumental and Ice Harbor, however, and there are no hatcheries on the river. The Corps maintained it could not justify a bypass system at Ice Harbor because it could capture and load onto barges enough juveniles at the three upstream dams to insure that adequate numbers of smolts made it to sea. The Corps' obstinance about the Ice Harbor bypass system angered fish agencies and some key Northwest politicians.

The issue came to a head in 1988. Northwest congressmen, particularly Idaho Senator James McClure and Oregon Senator Mark Hatfield, worked a 1987 proposal through Congress that enabled the Corps to spend $8 million on lower Snake bypass systems, including design work at Ice Harbor. Accompanying the funding came a report that provided specific instructions on how to disburse the money. But the Office of Management and Budget (OMB) and the Corps balked. Claiming such congressional reports had no binding, they refused to spend the funds as instructed. Technically, the Corps and OMB were correct about the report, but their decision nevertheless provoked Northwest congressmen who believed Congress's intentions were clear. Despite congressional protests, the Corps refused to reconsider. Major General H. J. Hatch, the Corps' director of civil works, chose to expend only $4 million, and then not on the bypass construction as outlined by Congress. The Engineers instead would use $3 million to purchase two new juvenile fish transportation barges and $1 million for additional studies to determine the bypass systems' cost effectiveness.

The Corps' stance 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 thirty cents in benefits for each dollar expended. Fishery agencies challenged the Corps' mathematics.

An even larger issue emerged in the Corps' affection for the Juvenile Fish Transportation Program. "We believe transportation is more efficient and productive than bypass," claimed Walla Walla District Engineer Colonel James Royce. Given enough barges, the Corps believed it could save more fish for less money by barging than it could by installing bypass systems at Ice Harbor and the Columbia River dams. "Even with improved passage around dams, you'd still have reservoir mortality," declared Walla Walla

District biologist John McKern. The Corps proposed to solve that problem by giving all the fish it could catch a ride to the ocean."[53]

Fishery agencies, tribes, and conservation groups sought to wean the Corps from its dependence on barging. There was, of course, the issue of whether chinook salmon could really survive transportation. The debate, however, proved even more complex. No dams below McNary on the Columbia—the one immediately below that river's confluence with the Snake—had barge-loading facilities or bypass systems. That meant that smolts had to get through the last three dams on the Columbia as best they could. According to Steve Pettit of Idaho Fish and Game, unless the Corps built more bypasses, fish entering the river below McNary would be left "high and dry." Further, the Corps does not catch every fish at its collecting dams, and those missed would be at risk if downstream dams had no bypass systems. "The Corps takes great pride in the juvenile transportation system," observed Pettit. "But it is not the only answer. We also need bypass systems."[54]

Despite the many allegations on both sides and legitimate differences of opinion over how best to preserve fish, the Corps' refusal to spend money in the way Congress requested drew reprimands. "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 remonstrated the Corps. "We consider your response to be completely unacceptable in its policy intent" he and Senator Hatfield wrote to the OMB. "I'm outraged," stated Idaho Representative Richard Stallings. "It's very clear what Congress intended." It was heavy artillery, and it had an affect."

While most critics blasted the Corps, like so many issues concerning fish preservation in the Northwest, this one was highly complex and much bigger than a disagreement between the Engineers and Congress. It was actually a battle between the Democratic Congress and Republican 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 . . . [is] putting pressure on the Corps to not release these funds."[56]

The Reagan administration believed the federal government had over-invested in various programs to save Northwest fish. Consequently, it wanted to scale back expenditures in the hope that state governments would fill the void. But in this particular battle Congress ultimately prevailed. 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 precisely as Congress dictated: it appropriated design funds for a new Ice Harbor bypass system. It did so reluctantly and unenthusiastically, however, still believing Ice Harbor's bypass system was economically unjustified. In a 1990 information paper the Walla Walla District noted, redundantly and somewhat petulently, that with new collection and bypass systems at the three dams above Ice Harbor, "construction of fish facilities at Ice Harbor is questionable."[57]

The figures get a little staggering: $50 million spent on fish-passage systems at the four Snake River dams at the time of construction and millions more in retrofitting them with juvenile bypasses; $220 million for the Lower Snake Compensation Plan and $10 million annually in operating expenses; millions more in the Juvenile Fish Transportation Program, scientific research, satellite tracking and monitoring systems, and staffing at laboratories and fish-counting facilities. It hardly seems unusual that, when the Bonneville Power Administration announced plans in 1992 to spend an additional three billion dollars over ten years to assist anadromous fish on the Columbia/Snake system, hardly anyone noticed. By then Northwesterners had become accustomed to expending astronomical sums in efforts to preserve their primary wildlife symbol.

What did surprise a lot of people was just how little success resulted from those huge expenditures. In the minds of most Northwesterners, things were not supposed to turn out this way. Sure, they enjoyed and sought cheap electricity and subsidized navigation. But most people—probably even most employees of agencies like the Corps and BPA—truly believed, at least at one time, that they could enjoy these benefits and have fish, too. As the region entered the last decade of the twentieth century, many began to question that possibility.

When the Corps commenced building its dams in the Northwest, the public looked upon them as aiding not only society but also the environment. Social critics like Lewis Mumford wrote about electricity's ability to eliminate urban pollution. Vast quantities of cheap hydropower in places like the Northwest had the potential to forge a utopian society. Thus, when the BPA hired folksinger Woody Guthrie to write propaganda about hydropower development on the Columbia, local residents believed his lyrics told the simple, honest truth. "Roll on Columbia, roll on," he wrote. "Your power is turning the darkness to dawn." While a few fish advocates agonized over the harmful effects of dams, most Northwesterners believed the dams symbolized both the beginning of a regional economic boom and an antidote for the pollution that plagued more-populated regions. Although no one used the exact terminology in those days, the dams were an environmental boon.

Northwesterners came to live well off the dams' cheap hydropower, irrigation, and navigation. They grew increasingly dependent upon them. And while fish biologists, commercial fishing organizations, and a few others continued expressing concern about fish, not too many people paid attention. After all, anyone could visit a federal dam and watch huge salmon steadily make their way up the ladders past the fish-viewing windows. Surely there could be no problems as long as big fish kept returning year after year. The federal agencies that operated the dams and sold the electricity proved reluctant to admit to declining numbers of returning salmon. And the fish did have remarkable abilities to cross the huge barriers thrown in their path. It might well have been that with just a few less dams, the Northwest could have had its hydropower, its navigation, its irrigation, and its fish, too.

But the few fishery biologists of the 1930s who warned of the cumulative effects of dams eventually proved right. Throw up too many obstacles and even these hardy, strong fish will become extinct. And when it came time for tiny fingerlings to negotiate eight dams between Lewiston and the sea, with the hundreds of miles of warm, slow-moving, predator-infested water in between—when it came to that time with the completion of Lower Granite in 1975—it quickly became apparent that something had gone wrong with the dream: Northwesterners could not have the benefits of eight massive dams and fish too—at least not without more sacrifice than they had so far been willing to accept.

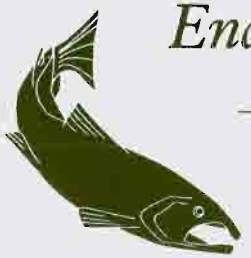
At that point, in the late 1970s, a belated panic set in and Northwesterners sought multi-million dollar options to help insure fish runs while maintaining a free navigable waterway and cheap electricity. For more than a decade-and-a-half residents of the Northwest tried to convince themselves that, with the proper infusion of technology, innovation, and money, they could still have their fish and their power and their shipping. And they proved willing to throw hundreds of millions of federal dollars into that effort.

By 1990, however, the hoax had been exposed. Even this mighty river system was helpless to provide all the water that Northwesterners demanded for fish, irrigation, power, navigation, urban water supply, and

recreation. Its magnificent fish could not surmount every obstacle placed in their way. By 1990 it was clear that the dams had truly endangered the salmon just as surely as hunters had once endangered the buffalo. By 1990 the only issue remaining to resolve was whether Northwesterners would finally prove willing to sacrifice to save the salmon, and how drastically their lifestyles might change should they be so willing. As the region entered the last decade of the twentieth century, the threatened runs of Columbia and Snake River salmon became the Northwest's most critical environmental issue.

Chapter 10

Endangered Species



Fish tie a huge region together. What happens on the continental divide affects fishing in Alaska and northern California. The region is all intricately connected and interconnected. And then you get all the political connections: state vs. federal, state vs. state; federal vs. federal; upstream vs. downstream, tribe vs. tribe. And then you get all the players—fishermen, irrigators, navigators, hydropower users, biologists. It is boxes within boxes, and the boxes are infinite. We are in a mess. It seems almost beyond human ability to deal with it.

Ed Chaney

In the high mountainous center of Idaho, nine hundred miles from the Pacific Ocean, Redfish Lake in the Sawtooth National Recreation Area spawns some of the world's most distinctive fish, *Oncorhynchus nerka*, the sockeye salmon. Although related to other salmon species of the Pacific Rim, the sockeye runs by a different clock. Most salmon hatch from eggs in cold mountain streams, spend a little time adapting to the freshwater where they will eventually return to spawn, and then make a beeline to the ocean. Snake River sockeye also hatch in shallow gravel beds, but they remain in the safe confines of Redfish Lake for up to two years before riding spring freshets to the sea, where they live for two or more years. Before they return to the lake at the base of the Sawtooth mountains their nine hundred mile return journey through the Columbia, Snake, and Salmon rivers takes them further while climbing higher (6,500 feet) than any other North American salmon.

The sockeye enter the Pacific weighing a few ounces and take on a blue-tinged silvery color (some people call them bluebacks). They develop into the slimmest and most streamlined of all salmon species. Before returning to Idaho they gain three to eight pounds. They give their home lake its name by turning bright red just before they spawn. Sockeye are closely related to the smaller kokanee salmon, the primary distinction being that the kokanee spend their entire lifecycle in freshwater, maturing in lakes before returning to their birthing beds to spawn and die.

Despite the perilous and arduous journey from Idaho to the ocean and back, Redfish Lake once supported thousands of sockeye. In the 1890s commercial fishermen on the Columbia caught more than a million sockeye annually, making sockeye the second most important fish of the stream, behind only chinook salmon. Not all the Columbia's blueback came from Idaho, but a good many did. They spawned in places like the Payette Lakes, Alturous Lake, Stanley Lake, Yellow Belly Lake, Pettit Lake, and Redfish Lake. So plentiful were the fish in these high Idaho waters that entrepreneurs sold thousands of pounds to nearby mining camps, shipped out more salted and barreled, and at one time even considered a cannery on Redfish Lake. On the Payette Lakes, commercial operators salted down as many as seventy-five thousand sockeye annually in the 1870s.[2]

As early as the 1890s residents of Idaho's mountain country noticed dramatic deterioration in sockeye runs. Commercial fishing operations in Idaho had all but ceased by then, and one resident reported on the declines in the Payette Lakes: "There used to be millions of them here. So thick were they that often, in riding a horse across at the ford, I have been compelled to get off and drive them away before my horse would go across. . . . [There have been] very few during recent years."[3]

In the twentieth century, people—including fish and game biologists—all but exterminated what remained of Idaho's sockeye salmon. On the Payette, a series of small irrigation dams virtually wiped out the runs, and the Bureau of Reclamation's Black Canyon Dam, 183-feet high with no fish-passage facilities, finished the job in 1924. At Alturas and other lakes feeding the Salmon River system, small irrigation projects likewise blocked access to most spawning grounds. Continued commercial harvest on the Columbia and irrigation blockages in Idaho, later combined with fish-passage problems at the huge Corps-built dams along the Columbia and Snake rivers, probably would have been enough to doom most of the

sockeye. But the Idaho Department of Fish and Game decided to make sure of the extinction in all but Redfish Lake.

Although hundreds of people annually traveled to Idaho's sockeye-rearing lakes to gaff, trap, or net the redfish, sockeye rarely took a hook, and sports fishers pressured the Idaho department to provide more opportunity to catch "game" fish. In other words, they wanted trout in their lakes, not worn-out salmon about to spawn and die. So the department—charged not so much in those days with protecting species as with appeasing a powerful sports fishing lobby—abetted the fishers by destroying sockeye. At Pettit, Yellow Belly, and Stanley lakes in the 1950s and 1960s it dumped so much poisonous taxophene that nothing could survive for a year or two. Having wiped out the sockeye and all other native fish, department officials then restocked the lakes with introduced species of catchable trout. Then, to insure that the few sockeye that escaped the holocaust by being at sea could never return, department workers blocked all entrances to the lakes and prevented the sockeye from spawning.

Redfish Lake, for some reason, escaped the Idaho Fish and Game onslaught. Redfish, however, had its own problems. In 1910 the Golden Sunbeam Mining Company constructed a dam on the Yankee Fork to produce power for its Sunbeam Mill. The dam never worked effectively except to block fish. Idaho Fish and Game recommended the company provide fishways, but they didn't work well either. Indeed, it is questionable whether or not any spawning sockeye between 1910 and 1934 made it past the dam. A small tunnel in the dam might have allowed some sockeye to make their way to Redfish Lake, although biologists debate the point: some say the dam completely blocked access to the lake and that no historic run of distinct Idaho sockeye remains. In any event, the Idaho Department of Fish and Game for once did something right by the sockeye when it blew up a portion of Sunbeam Dam in 1934 and restored a free-flowing river.

In the meantime, the department had planted foreign fish in Redfish Lake beginning in the 1920s. Over the next six decades it introduced thousands of sockeye and their land-locked cousins, the kokanee, bringing them in from throughout the Northwest. Some people claim that a few kokanee, perhaps breeding with the introduced sockeye, began migrating to the ocean and created an entirely new species of fish. The original gene pool of the Snake River sockeye—if it still exists—is highly diluted by now,

and some biologists, particularly those working for hydropower interests, argue that the Snake River sockeye does not deserve endangered species listing because it is a species indistinct from the plentiful Redfish Lake kokanee and not a true historic stock. Others, less concerned with hydropower profits, believe that any fish that survives an eighteen hundred mile roundtrip to the ocean deserves protection, whether a pure historic species or not.

In any event, when things became so bad that only one Snake River sockeye returned over Ice Harbor Dam in 1990, Idaho's Shoshone-Bannock Indians had had enough. They petitioned the government and the Snake River sockeye, whether a unique species or not, would join the list of America's endangered species.

The spotted owl crisis in the Pacific Northwest has pitted loggers against environmentalists and might have cost George Bush the electorial votes of Oregon and Washington in the 1992 presidential election. By claiming Democratic vice presidential candidate Al Gore would have "us up to our necks in owls," Bush failed to realize that most Northwesterners supported the spotted owl endangered species listing and its recovery. As heated as the spotted owl issue became, however, Idaho Fish and Game biologist Steve Pettit believes, "The issue of endangered species for salmon could make the spotted owl controversy look like a pillow fight." [4]

There are dramatic differences between the owl and salmon issues. For one, the owl touches the livelihood of a few thousand woods workers. The salmon potentially affects the lifestyles of anyone in the West who uses Snake or Columbia river hydroelectricity. Beyond that, the spotted owl issue proved relatively simple to isolate. Determining the owl's endangered status was a straightforward task: scientists came up with estimates of how many breeding pairs existed and at what point the population would drop so low the species could not perpetuate itself. But in the salmon issue, even defining a "species" creates contention.

Each tributary of the Columbia and Snake is believed to produce a genetically distinct run of salmon specifically adapted for the peculiar needs of migrating to and from its particular stream. These are fish that, for the most part, breed only with their neighbors from the same stream. Under Endangered Species Act language, a distinct fish population in a specific geographic spot is eligible for protection. There are, therefore, literally hundreds of "species" of salmon in the West, and in 1991 the American

Fisheries Society reported that 214 of these faced potential extinction.[5]

In an earlier time, when biological science played no role in fishery management, Idaho's Shoshone-Bannock Indians came to rely upon the dependable annual return of sockeye to the Salmon River region. Of course, the Sho-Bans were not alone in that. Native American lifeways in the Northwest evolved with the salmon; religion, world view, traditions, and history revolved around the annual salmon runs. Downstream tribes closer to the Columbia and Snake rivers naturally depended more upon the fish than did southern Idaho's distant Shoshone-Bannock. The annual hunt of salmon in prehistoric and historic times, however, took the Sho-Bans from desert homes to wooded, mountainous country in search of the plentiful fish. They speared and trapped chinook, coho, and sockeye with relative ease in the days before irrigation and dams and state-supported fish poisonings.

All Northwest tribes suffered as salmon runs declined. The most famous regional Indian fishing grounds at Celilo Falls on the Columbia—where the Corps of Engineers labored so long in the nineteenth century to create a canal opening the river to navigation—now lies inundated beneath the backwaters of The Dalles Dam. But at least downstream tribes can still fish along the river, although catches have dramatically waned in the twentieth century. With the exception of a few chinook that still manage to struggle to the mountains of Idaho, the Sho-Bans are reduced to spearing hatchery salmon trapped by Idaho Department of Fish and Game personnel, trucked over the mountains, and carefully planted at selected spots specifically for the tribal fishery; virtually no wild fish enter Idaho's once-abundant salmon streams.

As one example of Ed Chaney's "box within a box," the salmon crisis in the Northwest has pitted tribe against tribe. When the Shoshone-Bannock petitioned to place Snake River sockeye on the endangered species list in 1990, other tribes became concerned. Such a listing might further reduce downstream fishing or in other ways alter lifestyles. The endangered species listing could, for instance, affect northeastern Washington's Colville Indians. They, too, once depended upon salmon, catching them at the second most famous fishing spot in the Northwest, Kettle Falls. Grand Coulee Dam, however, put a stop to that by blocking all anadromous fish migrations. In the decades since the 1940s the Colvilles adapted by building marinas and renting houseboats on Lake Roosevelt, the reservoir behind Coulee Dam. Proposals to flush juvenile fish to sea by reducing Lake Roosevelt's water level worry the tribe. They fear that such a drawdown

could leave a primary source of Colville tribal wealth high and dry by creating unusable marinas during much of the tourist season.

For their part, Sho-Bans claim that in petitioning for endangered species listing they only sought what was fair. The salmon once came to their lands and they want them to return. The downstream tribes should be willing to share what limited bounty remains. Indeed, some Shoshone-Bannock, who do not fish commercially, are as upset at downstream Indian commercial fishers as they are at their white counterparts, the Bonneville Power Administration, and the Corps of Engineers: all, in their view, have contributed to the virtual elimination of Idaho salmon. "We don't sell our [fish]," says Sho-Ban salmon hunter Danny Edmo. "They [downstream tribes] have got the big numbers where they can rely on it for profit. We get the very limited number for ceremonial use."[6]

Congress passed the Endangered Species Act in 1973 and, six years later, the first petitions arrived to list selected Columbia River salmon. Officials concerned about the federal government imposing actions in what they considered a regional problem put off a decision on those petitions and instead encouraged Congress to establish the Northwest Power Planning Council to enhance the Columbia Basin's fish and wildlife. The council wrote ambitious goals to more than double then-existing runs of Columbia/Snake river salmon, and for a while it appeared its emphasis on hatcheries, bypass systems, and fish barging might work. In the period from 1985-87, annual salmonid fish counts over Columbia and Snake river dams more than doubled from their levels in the 1970s. But by 1988 it became apparent that these figures represented a glitch, not a trend. The increase in returns actually resulted *not* from council-backed sophisticated fish technology but from a few years of abundant water in a region facing an era of drought. By the 1990s most runs had declined to their 1970s levels or below, although a few fish, particularly hatchery steelhead, showed some improvement under the council-inspired recovery efforts.[7]

In 1988, during a time when the Corps and BPA attempted to convince people that the region had turned the corner in its fish crisis by citing the increased returns, other federal officials quietly declared the Snake River coho salmon extinct. Runs had declined from as many as six thousand annually in the 1960s to nothing by 1986. With little fanfare, the Snake River coho thus joined the upper Columbia River summer chinook, Lewis River spring chinook, Klickitat River sea-run cutthroat, Sandy River summer steelhead, and more than sixty other Columbia River native species now extinct.

In 1962 nearly a hundred thousand chinook salmon entered the Snake River; by the late 1970s that number had plummeted to less than fourteen thousand before showing a rebound created by hatchery-produced fish. By 1991, however, chinook runs had dropped again to fewer than fourteen thousand and in 1990 fish counters recorded only seventy-eight fall chinook—this on a river that once averaged more than two-and-a-half million wild chinook returnees annually. The Snake River sockeye had no luxury of artificial hatchery stimulous and its numbers dropped even more precipitously: from more than a thousand annually in the early 1960s to one in 1990. On the verge of becoming extinct, Idaho's Shoshone-Bannock in the spring of 1990 petitioned the National Marine Fisheries Service (NMFS) for an endangered species listing for the sockeye. Two months later several organizations—Oregon Trout, Oregon Natural Resources Council, Northwest Environmental Defense Center, American Rivers, and the American Fisheries Society—petitioned to list Snake River spring, summer, and fall chinook.[8]

Ignoring opinions that the Snake River sockeye is an "impure" species, NMFS in 1991 declared it endangered, basing its decision on two factors. First, Redfish Lake kokanee and sockeye spawn at different places and different times. That fact alone significantly decreases the chances that the sockeye are really just a form of kokanee that started swimming to the ocean once Idaho Fish and Game officials blew away part of Sunbeam Dam in 1934. Second, after conducting DNA research on the two fish, NMFS became convinced that Redfish sockeye were genetically distinct from their neighboring kokanee. In 1991 four sockeye returned to Redfish Lake, three males and one female. Biologists carefully extracted all of the female's eggs and began rearing her offspring in two hatcheries in an effort to reintroduce the Snake River runs. In 1991 NMFS also declared Snake River chinook threatened. (In 1994, NMFS changed the chinook's status to endangered.) The endangered and threatened listings required the federal government, in consultation with Northwest states, to develop a plan to help the fish recover.[9]

The endangered species rulings had an immediate impact. For the first time since the Corps began contemplating dams along the Columbia River system, fish gained equal priority with hydropower, navigation, and other river interests. Over the years biologists had warned about ebbing fish runs once the rivers became plugged, and many federal agencies paid lip-service to fish protection. But never had anything stirred so much action as the threat of the Endangered Species Act. "One of the main reasons that we in

the Northwest enjoy extraordinarily cheap power and cheap water is because we're putting the real cost on the salmon and the bill has come due," said Jim Pissot, director of the National Audubon Society in Washington state. Oregon congressman Ron Wyden put the issue more bluntly: "The evidence shows over the years that when Bonneville [Power Administration] wanted to go with a nuclear project or capital project, it moved like grease through a duck. But when [biologists] were talking about promoting natural fisheries stock, they [the BPA] just did not give it the type of commitment that was needed."[10]

The endangered species listing brought immediate gloomy forecasts from the BPA, which predicted drastic electricity price increases even before NMFS had a chance to consider recovery alternatives. The BPA, port officials, aluminum companies, and some politicians—who hoped that spreading alarm about the dire impacts of salmon listing might provide an opportunity to gut the Endangered Species Act—pointed to similarities between the spotted owl and salmon crises. The comparisons, however, are disingenuous. True, the salmon controversy does indeed have the potential to make the spotted owl controversy look like a "pillow fight." But the very size of the salmon issue, affecting virtually everyone who lives and works in the Pacific Northwest, also has the potential to diffuse its direct effects. Unlike the owl controversy, where woods workers must shoulder the bulk of recovery costs, salmon recovery can spread across a much broader spectrum. While the BPA and some industry officials quickly predicted regional economic doom, the listings could have quite a different result. As Dan Silver, an aide to former Washington governor Booth Gardner noted, "The economic impacts will be not nearly as severe as the spotted owl was. . . . We're not facing an economic calamity, we're not facing economic disaster. The net effects will be higher power costs and some market adjustments as far as moving products to market."[11]

There is no doubt that salmon recovery will have dramatic effects in the Northwest and beyond. Southern Idaho irrigators might have to use less water. Hydropower generation will probably decrease and electricity rates rise. Drawing down reservoirs to increase river velocity to help flush juvenile fish to sea could disrupt barge traffic and increase shipping expenses. Commercial fishing harvest by both white and Indian fishers will be severely limited. Sports fishers might have to do without catching salmon at all. The ramifications of that would reverberate throughout the region at a time when tourism is the area's primary growth industry. In short, the salmon issue has far-reaching implications, and its impacts could affect everything

from the cost of air-conditioning in California to the availability of wood pulp shipped down the Columbia/Snake waterway for Japan's cloth industry. Indeed, for many individuals, the fate of the salmon is the most overriding concern of their lives. It influences everything from how they make a living to where they live. For people like Kent and Irene Martin, who reside four hundred miles from Idaho, the Snake River salmon crisis has all the drama anyone could want and most people would just as soon avoid.

Kent Martin attended college in Washington state and Newfoundland before ending up in a doctoral program in marine anthropology at Rutgers, where his research focused on people who had made their livings by fishing. A fourth-generation resident of Skamokawa, Washington, located on a sharp bend of the Columbia River just about twenty-five miles upstream from the Pacific Ocean, it never occurred to Martin until later that he was actually studying himself. You tend to think of anthropologists as being "interested in exotic cultures," Kent says, and it took him a while to include himself in that category.

Kent and Irene Martin and their two daughters live across the road from land Kent's great-grandfather farmed. Four generations of family lie buried in the local cemetery. He stores fishing equipment in a logging warehouse his father built. Kent had cousins and uncles who fished commercially and he knew plenty of farmers and loggers. "Most of the people I grew up with could talk about setting steam chokers for logging and milking a cow," Kent remembers. They could also talk about gillnetting for salmon in the Columbia. "Fishing attracted me more than logging or farming," he admits, but he also recognized the value of education. So he set off in pursuit of an academic career. After a while at Rutgers he realized he could never abide the politics of a college campus and returned to Skamokawa to fish.

To walk into Irene and Kent's home one would never guess, judging by the collection of original art depicting fish and fishing that adorns every wall, that salmon are endangered. Fish literally surround you. But it doesn't take long to discover that declining fish runs are a threat not only to the fishery resource, but also to this family, to a way of life, and to communities like Skamokawa. During the course of an afternoon with the Martins, fellow fisherman Dean Badger comes to discuss his and Kent's upcoming season in Alaska, where Kent has journeyed for a few months

of work every year since 1970. Those were the days when he and folks like Badger discovered they could no longer piece together a living from the declining seasons imposed on Columbia River gillnetters. In Alaska, Columbia River fishers now join seventeen hundred others in the largest commercial salmon fishery in the world, part of a Pacific Rim industry that annually harvests about $5 billion in salmon.[13]

Badger wears an extra-large T-shirt covering huge shoulders, arms, and an ample girth. It pictures a fishing boat circled in red with a diagonal slash through the middle. It reads "Endangered Species," and you soon get the feeling that any endangered species listing for Snake/Columbia river salmon also ought to include people like Badger and the Martins.

Kent Martin understands better than most that Columbia River fish are on the decline. You don't invest tens of thousands of dollars in fishing equipment in Alaska and uproot from your family every summer just for fun. You make those kinds of adjustments and investments because you've got a problem making a living off fish at home. Kent recognizes the problem, but he differs with a lot of people on the cause.

"Fishermen haven't done much about public relations," he admits. "They are aloof. This aloofness has in many ways crippled us." Martin points out that commercial fishers have become scapegoats for the Pacific Northwest salmon crisis. Most everyone seems out to get them. "Recreational fishermen are hostile toward us. 'We cheat; we use nets,' they say. The power companies have taken up a lot of this rhetoric to get the issue focused on us and not on dams. State fishery agency directors serve at the pleasure of the governor, and the governor listens to people. Most of the power used in the Pacific Northwest goes to the population bases in Oregon's Willamette Valley and Washington's Puget Sound. So the governors dance to the tunes of these population bases. In order to appease the voters, the state agencies blame commercial fishermen for declining fish runs, and each time they take a whack out of our season this seems to confirm people's suspicions that fishermen are the problem."

"On top of that," Martin continues, "we have to battle the image of high-seas drift nets. A Columbia River gillnet is pretty selective. You can vary the mesh size so that smaller fish can go through uncaught; you can select what days you are on the river and allow threatened stocks to go upstream untouched. There is no totally clean fishery, but gillnets are pretty clean. High-seas drift nets catch everything, and most people tend to equate all nets. So that makes us out to be evil—the same as someone catching those cute dolphins in the ocean. Actually, no biologist I know will tell you that high-seas drift nets have any appreciable impact on endangered Snake River salmon. They catch some steelhead, but Snake River salmon stay too close to shore to be caught by those nets. But now people are trying to blame high-seas drift nets for part of the salmon problem. That is misdirected attention. All it does is focus on harvest and create a smoke screen to cloud the *real* problems—dams and upriver development."

Martin points to statistics that agencies like the Bonneville Power Administration and Corps of Engineers have only recently, and then only reluctantly, come to admit, that dams claim 95 percent of fish mortalities on the river system. "If I get caught over-fishing, I can go to prison," Martin says scornfully. "But the Corps can destroy thousands of fish with impunity." The Corps, BPA, and aluminum companies that thrive on the region's cheap hydropower continue beating the tired old horse of overfishing. In the spring of 1993 ten aluminum manufacturers and 114 public utilities filed a federal suit to halt all commercial fishing in the lower Columbia and to close all federal lands in the Columbia Basin to logging, grazing, and recreation. The suit, conveniently, said nothing about dams and the 95 percent mortality they cause. On the contrary, the suit concentrated on a fraction of the 5 percent mortality caused by habitat degradation and fishing. The aluminum companies specifically avoided challenging Indian and sports fishers, who are responsible for a good portion of that 5 percent mortality not brought by dams. Instead, the companies focused on a tiny portion of the problem. No one except aluminum and utility company officials believed that a court victory would make any substantive progress toward saving salmon. The aluminum firms obviously want cake and frosting. They cavalierly suggest that fishers like Kent Martin retire their nets while the BPA continues to subsidize their aluminum operations with below-cost hydropower.

Martin sees many misplaced resources wasted in the efforts to further wrench down commercial catches. In the early 1990s the Bonneville Power Administration funded a $10 million program to apprehend Columbia and Snake river salmon poachers, aiming a disporportionate amount of its resources at commercial fishers. The BPA even provided the fish police with night-vision equipment left over from Operation Desert Storm in Kuwait. The initial effort in October 1991 caught no poachers and did nothing to preserve fish runs. "I don't have any time for poaching," Martin says, "but again, this is just an attempt to blame harvest." Seconded another lower Columbia gillnetter, Frances Clark, "We view it as a publicity stunt by Bonneville."[14]

"Recreational fishers see us as competitors, but we're not," Martin claims. "Once at a public meeting a woman said, 'I can only catch three fish a day, but gillnetters can catch all they want.' Aside from the fact I've never caught all I wanted, we have different motivations. I am fishing for a market and a livelihood. Besides, only some types of salmon will take lures as they move up the river—only 10 percent or so will bite. Gillnetters can catch those that don't bite; recreational fishers can't."

Martin watched agonizingly as neighboring Oregon voted in November 1992 on a proposition to ban all commercial gillnetting by Oregon fishers, a proposal bankrolled by recreational fishing groups and supported by electric utility companies. It was similar to a 1942 ballot measure brought by recreational fishers in Oregon and it was, in Martin's view, an unnecessary fight. There were once and would once again be plenty of fish for both recreational and commercial fishers if the fish could survive the gauntlet of a river choked with dams. Oregon voters defeated the 1992 measure just as they had in 1942, but proponents vowed to try again, next time coordinating efforts with anti-gillnetting groups in Washington in an attempt to pass measures eliminating all non-Indian commercial fishing in the river.[15]

Martin views recreational fishing groups as part of a larger threat that would change places like Skamokawa into tourist towns catering to bed-and-breakfast escapees from urban America. Skamokawa, a town of a few dozen people, is the kind of place a California magazine writer would inevitably call quaint. Steep-roofed frame houses hug Skamokawa Creek, which flows into quiet Skamokawa Harbor. A couple of generations grew up in this town living completely on the water, rowing from house to house and business to business and home to school in what locals called "The Venice of the Columbia," a town for many years without streets. There are roads now, but the creek, the harbor, and the river remain the focus of the community. Wooden docks extend from most houses, and a still-considerable fishing fleet ties up in the harbor.

It is the kind of quiet, nostalgic setting that could attract tourists, and Irene Martin has invested much of her life attempting to do just that. She has helped transform the town's most prominent structure into an interpretive center that will explain to those visitors just how the loggers, farmers, and fishers of Skamokawa made their livings and raised their families in this place. But that doesn't mean Kent and Irene want their town to become a rustic Columbia River resort. "These asses come down here from the state capitol and say, 'Your salvation is tourism,'" Kent

Martin mocks. "I'm supposed to wait tables? The I-5 corridor [from Portland to Seattle] wants to turn these communities into cutsey places so they can have fun coming to recreate while we starve. They want to tie up all this area for themselves. And that's part of the mentality we're dealing with on the fish."

Kent Martin sees the demise of commercial fishing destroying both his way of life and his community. More than that, however, he speaks passionately of the total collapse of the Snake/Columbia river fishery resource: "I think the intent is to destroy commercial fishing. If you have a commercial fishery, you've got to explain to the fishermen why there are no fish coming into the river. With no commercial fishery, you can put in a few riffles by a dam and have tourists come and see a handful of fish. Commercial fishermen are the watchdogs for fish and environmental protection. The commercial fishery has a vested interest in fish. I've got $100,000 in Columbia River equipment. It is not in my interest to overfish or deplete the runs."

"If we lose the commercial fishery, we're going to lose the ballgame," Martin maintains. And he is not optimistic. "I'm very cynical that we have the will to save the fish. The hydropower people want to kill us, so then it will be easier to kill the fish. The technology exists to turn the Columbia/Snake fishery around, but we're not seeing the will to do it."

To Kent and Irene Martin the fish issue is far bigger than Skamokawa, the Columbia and Snake rivers, or even the Pacific Northwest. The fish are threatened because of an insatiable national appetite. "We as a society think everyone can have several cars, a boat, a hot tub—and that there is no cost other than money," says Kent. Seconds Irene, an ordained Episcopal minister, author, and historian: "We have to get past the mindset that we can give money to environmental groups and we can volunteer to pull weeds and we can recycle, and so therefore we can have a swimming pool in our yard. There is a necessary connection between dwindling resources and our ways of life that people just don't seem to understand. We think its OK to buy toys to reward ourselves for hard work, but we don't look at the real costs of those toys." Her words reminded me of a statement Northwest conservationist Bill Bakke made a couple of years ago: "Turn on a light switch and kill a fish."

We have not quite reached that point where every flick of a switch kills a salmon, but there is no doubt Northwesterners cannot have both fish and ever-rising electrical consumption. Some residents of the region are beginning to make that connection; energy conservation seems to have

some chance for success in the future. Whether that conservation comes soon enough to save the salmon or people like the Martins remains to be seen, but Kent and Irene Martin are skeptical.

"Until recently," Kent mused, "the Columbia River represented 40 percent of my income. But there is nothing to come home to now. You hear about the big years, the big jag, but you don't hear about the in-between years." And recently, it seems every year on the Columbia has been in-between for commercial fishers like Martin. The day after my visit he would investigate the prospects of moving his family to Prince Rupert, British Columbia, closer to his Alaska fishing waters. The thought depressed him. And why not? In Skamokawa he leads a cherished way of life, surrounded by so much family history. This is a safe place for him to raise his daughters and visit daily with friends of a lifetime. "I don't want to leave this country, but every time I roll the dice I turn up a loser."

To people like Kent Martin, salmon are more than a commodity and salmon fishing is more than a business. "It's a religion, it's my whole life, it's my identity," he says. The statement recalls some of those Irene included in a video she produced about Columbia River gillnetting. "Fishing is in my blood," said one interviewee. "Nothing I like better than the sight of a salmon coming over your roller." Or another: "There are times when I fish for long periods of time that the boat, and I, and the water, and the sky, and the net—the whole works—become one. I'm part of that. It's a marvelous oneness that occurs."[16]

Back in the 1930s Columbia River gillnetters forced the Army Corps of Engineers to include more sophisticated fish-passage equipment at Bonneville Dam than the Corps had originally intended. Commercial fishers fought against fish-killing river pollution and forced irrigators to screen diversion canals to prevent smolts from dying in farmers' fields. Commercial fishers encouraged upstream habitat improvements. And they did, for a good many years, overfish the river.

But Kent Martin is right. Overfishing by commercial fishers is not now the problem for Columbia/Snake river salmon, and it hasn't been for decades. Commercial fishers have become scapegoats for power companies and Army Engineers and port officials and recreationists and a host of others who want to pass along the sacrificial buck and who have plenty of money to spend in an effort to kill gillnetting along the Columbia. And they probably will destroy commercial fishing, and people like the Martins will have to move on. The destruction of the commercial fishery will not bring the salmon back, however, and it might well doom the fish, for

when Kent Martin leaves there will be one less watchdog keeping an eye on dwindling salmon. We will probably always have a few salmon to gawk at, like caged animals in a zoo, but that is not a resource. The Martins, like the salmon, truly are endangered, but one is not the most serious threat to the other. Both the Martins and the fish could survive. Fishermen and the fish once did coexist on this river system, but that was before dams and cheap power. Now a whole region has grown used to ignoring the real consequences of flipping a light switch.

Cory Eagen and Eldon Crisp are not threatened in the same way as the Martins, but some fish-saving proposals—particularly an annual drawdown of Snake River reservoirs to help flush smolts to sea—could disrupt their lives for months every year, perhaps seriously eroding their earning potential.[17]

Cory Eagen began working on tugs and barges along the river in 1948. "It was the year of the Vanport flood that killed all those people near Portland," he recalled one spring evening as he piloted the tug *Idaho* down the moonlit canyons of the lower Snake River. "I got initiated in a hurry."

"I worked for twenty-eight years on the river and never got farther upstream than Washougal—never saw Bonneville or any of the other dams," he remembers. But he sees them regularly now, hauling wheat, petroleum, wood chips, logs, and container barges for the Brix navigation company, pushing five or six barges at a time, loads 84 feet wide and more than 650 feet long. The lower Snake and Columbia river locks are 86 feet wide. Maneuvering barges 84 feet wide into them is like trying to park a Cadillac in a space better suited to a Honda. "When you've got 650 feet of barges in front of you," he says, "sometimes the fog is so thick you can't even see the front end." It can take all day getting through Bonneville Dam, the only one on the system with locks narrower than 86 feet. Pilots like Eagen must tie up outside the locks and haul barges through one at a time. Soon, new locks will eliminate this bottleneck in the heavily navigated Columbia/Snake waterway. The "sea locks" that groups like the Inland Empire Waterways Association successfully advocated in the 1930s have long since become outmoded.

Eagen has been making the trip up the lower Snake from Portland for more than a dozen years, working shifts six hours long, taking six hours to rest and catch some sleep before going back to the wheelhouse, working seven days straight, taking seven days off. His grandfather operated the

first tug on Coos Bay, Oregon. "There's been a member of my family in the maritime business for the last 150 years," he says proudly. "But when I retire, it's the end of a line. None of my kids are interested. All they know about it is how much time I had to spend away from home when they were growing up."

Chances are Cory Eagen will retire before the Snake experiences a permanent annual closing of navigation, if that day ever comes. Many conservationists in the Northwest advocate a Snake River drawdown that would halt navigation for two months each spring while smolts make their way downstream. The drawdown would increase river flows. Conservationists see this as the only way to obtain the velocity required to flush fish safely and quickly to the ocean.

Herbert West must be rolling over contemplating an annual cessation of navigation. West's vision, and that of others like him, brought the Pacific Northwest a navigational system, one that moves more than seventeen million tons of commodities annually and exports more cargo than any other port on the West Coast. It handles $10 billion in import and export goods each year. It is a system that transports approximately one-third of the nation's total wheat crop at about a sixth the price it would cost if the crop went by truck. Tamper with this system and you tinker not only with the earnings potential of individuals like Cory Eagen, but also with the economic health of an entire region. The State of Washington is the most trade-dependent state in the nation. As much as cheap hydroelectricity, its late-twentieth century economy depends upon an open Columbia/Snake riverway. A drawdown would temporarily put many tugs out of business, sending crew members home to live off savings or unemployment.[18]

The drawdown also greatly concerns Eldon Crisp and his boss at the Port of Whitman County, Jim Weddell. The port at Wilma, operated by Whitman County just across the river from Clarkston, Washington, is the lower Snake's largest. Here you can see Herbert West's dream come true. Eldon Crisp lives there in a house overlooking the river where he watches the water traffic and dreams of how much more the Snake could handle. He is Wilma's port superintendant and he wore a Port of Whitman T-shirt, jeans, and Nikes on the spring day we met. He drove me around the 250-acre Wilma site in his pick-up.

We went past the Bennett Lumber Products' planing mill and Stegner Grain's elevators: "Lots of times we'll have thirty-five to forty trucks lined up here during wheat harvest, stacked bumper-to-bumper clear to the road, waiting to unload at the elevators." We drove to the Mountain Fir Lumber Company, by the factory assembling log home kits for shipment to Japan, past the concrete block manufacturer.

Build the dams and development will come, Herbert West said. And here, where Lewis and Clark camped on May 4, 1806, development has come. But Eldon Crisp envisions more. He wants to extend the port downstream to lure even more industry, a restaurant, maybe a hotel: "I don't see Lewiston and Clarkston becoming a major metropolitan area, but with increased river transportation they could become more of a hub." If you shut down this and the seven other ports between here and Ice Harbor Dam for several months each year, however, you might forget about expansion. Indeed, you could forget about some of the current businesses remaining, because most of them claim they need a reliable and steady mode of transportation to ship goods in and out. They depend upon the year-round open river. Close the ports part of each year and you not only disrupt business but you probably eliminate jobs. Yet to an environmental activist like Ed Chaney, a lower Snake River drawdown appears the only reasonable alternative if the salmon are to survive.

As you enter Ed Chaney's home office on the outskirts of Eagle, a tiny bedroom community near Boise, Idaho, two things become readily apparent. First, Chaney has little time for housework. Dishes totter uncertainly in the sink; the expansive yard might most charitably be called wild. Second, one need not have money or a huge staff to play a principal role in the Pacific Northwest fish wars. The loner Ed Chaney has more than occasionally brought the fear of God to bureaucracies like the Army Corps of Engineers and the Bonneville Power Administration. He has sat on virtually every significant panel and board contemplating the Northwest salmon crisis. He speaks with an unwavering voice as a fish advocate, and when he speaks, reporters, bureaucrats, politicians, and environmentalists listen. And he accomplishes all this virtually single-handedly from his ramshackle house using little more than a telephone and home computer.[19]

Chaney came to the Pacific Northwest on a whim in 1966. Raised in the Midwest, he picked up a map one day, saw a place nearly all green, and decided to move west. He landed a job managing commercial fisheries with the Oregon Fish Commission. In 1968 he ran headlong into the Army Corps of Engineers, which had brought John Day Dam on the

Columbia into operation without adequately testing its fish-passage facilities. The resulting fish kills brought the fury of environmentalists and the investigation of reporters, and Ed Chaney helped lead the charge. "I caught the Corps red-handed burying fish, trying to hide them while publicly denying any wrongdoing," Chaney recalls. "The Corps went after me, a young lowly bureaucrat, with a vengeance. This made me a student of why we do these things. What drives people to lie and manipulate and intimidate in order to deceive the public? That's what got me started on the Columbia River fishery issues."

The Corps won that battle; a chastened Ed Chaney left the Oregon Fish Commission and moved to Washington, D. C., as information director of the National Wildlife Federation. But he returned to the Northwest, and the Engineers have probably regretted their vendetta ever since. Ed Chaney never forgot or forgave. John McKern, biologist with the Corps' Walla Walla District since 1971, will admit—in proper Corps understatement—only that Ed Chaney is "outspoken." But body language at the mention of his name clearly indicates that there is today, a quarter of a century after the John Day incident, little mutual respect between the environmental gunslinger and the agency that operates the dams.[20]

Ed Chaney refuses to cut the Corps of Engineers much slack: "In the 1940s fishery agencies told the Corps that if they built the lower Snake dams fish would probably not survive. Before the first lower Snake dam, we recognized the problems slackwater caused smolts, and we knew about the negative cumulative impacts of dams. But the Corps is *still* in a state of denial. They admit that dams kill some fish, but in the same breath they always say that 'commercial fishing kills fish, too.' They will say that 'barging fish helps smolts' when all evidence indicates that chinook salmon smolts do poorly when barged. They blatantly manipulate the data and reasonable people are caught off guard. Reasonable people are intimidated because the Corps appears to have the expertise."

Even so, Chaney believes the Corps might actually end up saving the salmon. "The irony is that the only thing that might save the fish is the Corps' instinct for survival," he admits. "I hate to think the fish are now in the hands of the world's biggest fish killers. But the Corps might start proselytizing to save the salmon in order to save itself. The marketplace has changed and not even the Corps is imperious to the marketplace. The Corps' days of scattering reservoirs like seeds are over. The Corps is going to change because nothing is more frightening to them than running out of work. So in time the Corps will become a constructive force. They are trying to head in that direction now through their innate sense of survival."

In 1990 Oregon Senator Mark Hatfield called together a "salmon summit" of representatives of resource agencies throughout the Northwest to hammer out ways the region could address fish needs in anticipation of the upcomng endangered species listings. Hatfield wanted nothing of another spotted owl "debacle" where the federal government imposed preservation regulations because the region had not prepared a formula of its own to protect the birds. Ed Chaney attended those salmon summit meetings as a primary advocate of what became known as the "Idaho plan," a proposal to draw down the lower Snake reservoirs every year when the smolts make their way to sea.

"Governor Andrus asked me to get some interested parties together and decide on some concrete alternatives we could take to the salmon summit meetings," recalled Andy Brunelle, who was Cecil Andrus's special assistant for natural resources. "The biologists like Ed attending that meeting said that if you could increase the river's flow, you could get the smolts through the reservoirs, past the predators, and to the ocean on time." The lower the velocity of the river, the fewer smolts survived. Once the fish reached the Columbia, river manipulators like the Corps and Bureau had a variety of options to speed them on their way past the next four dams, including releasing water from Canada and Grand Coulee's reservoir. Once in the Columbia, in other words, there would be enough stored water to increase velocity to assist fish without totally disrupting irrigation or navigation. So the problem Andy Brunelle's group faced was getting the salmon smolts down the lower Snake.

Most people believed that the only way to increase the Snake's flow was to drain irrigation reservoirs in Idaho and rush that water downstream. Irrigators—and politicians like Andrus who depended upon their votes—were not about to listen to that alternative. "Besides," continued Brunelle, "the water simply did not exist to create the velocity we needed." Especially not in the midst of one of the West's most severe and long-term droughts.

"We had to come up with an alternative," Brunelle remembered, "and Keith Higginson said, 'If you need that much velocity, the only way to get it is to draw down the river.'" Environmentalists and biologists latched onto the drawdown concept, something that might have surprised R. Keith Higginson, for he is not always on the side of environmentalists.

Higginson moved to Idaho from Utah in 1964 when Republican Governor Robert Smylie appointed him to the state Department of Water Resources. Republican Governor Don Samuelson reappointed him, as did Democrat Cecil Andrus in 1971. Andrus and Higginson worked together well, and when Andrus moved to Washington, D. C., as Secretary of the Interior under Jimmy Carter in 1977, Higginson went along to head the Bureau of Reclamation. When Andrus returned, winning election as governor once again in the 1980s, he reappointed his old friend to head the state Department of Water Resources. Higginson has always identified with irrigators and understands their point of view, a necessity for retaining his job in an irrigation-dependent state like Idaho.

"There is nothing Idaho is now doing that is endangering the salmon," Higginson maintains. "Idaho is holding water for irrigation, but it is not a lack of water that is harming smolts, it is a lack of velocity. Downriver interests in Washington and Oregon want people to think that Idaho irrigators are to blame for the fish crisis. We say the fish are fine until they get to the dams. The lower Snake dams are killing the fish. The bulk of the resolution of the problem should not fall on Idaho farmers."[22]

So, the Idahoans meeting with Higginson and Chaney and Brunelle came up with the Idaho drawdown plan: drop down the reservoirs behind the four lower Snake dams, thereby reducing the width of the river and increasing velocity in the narrower stream. The lower Snake would once again look something like a river instead of a lake, and the smolts could again ride to the ocean in a timely fashion rather than wander around in still water and become snack food for predators.

It did not take long for the Corps to criticize the proposal. Said Corps biologist McKern: "The concept to pull the plug on the reservoirs and let the river run naturally is simplistic. It won't work. Navigation will halt; turbines won't be able to operate properly and will kill more fish; fish bypass systems will be left high and dry, stranding both adults and juveniles." Indeed, the Engineers came up with a host of reasons to condemn the drawdown even before they gave it an experimental chance. The Corps even threatened that it might need to get reauthorization from Congress—a time-consuming proposition—to implement drawdowns, because the dams were constructed primarily to aid navigation. Drawdown proponents, however, noted that Congress also intended that fish runs be preserved and that congressional authorization stated nothing about the riverway being navigable every month of the year. "The Army Corps of Engineers failed to properly design the four lower Snake River dams as Congress intended," bluntly stated a publication of Idaho governor Cecil Andrus's office. "The dams must be modified so reservoirs periodically can be drawn down to speed water and young salmon . . . to the ocean."[23]

The Engineers projected problems ranging from the loss of nearly a million visitor days of recreation annually at the lower Snake reservoirs—a conclusion that surprised some local residents who wondered where so many recreationists originated from in this lightly populated region—to threatened kills of adult migrating fish because fish ladders could no longer operate, to the loss of millions of dollars worth of hydropower. The Corps, the Bonneville Power Administration, and port officials quickly seized the idea of a drawdown lasting three, four, even six months, with dire economic consequences. They ignored the fact that the Idaho plan called for a two-month drawdown in the spring when 80 percent of juveniles go downstream—and long before the peak recreational period on the river.[24]

The Corps and BPA response did not surprise proponents of the Idaho plan. "I can envision the Corps coming up with a whole laundry list of problems, then throwing up their hands and saying, 'See, the drawdown won't work. Let's get water out of Idaho,'" said Higginson. Ed Chaney had little patience with Corps' efforts to censure the drawdown before even trying it: "The Corps is looking at it the wrong way. They want to find problems. 'Oh, look, you draw down, and adult fish ladders and juvenile bypassses don't work.' But they should look at solutions—what *can* we do. We need a 'can do' attitude and the Corps doesn't have it. They're trying to poison the well. They are handing out disinformation. For example, no intelligent people would propose a drawdown without also proposing to fix fish ladders." Added Governor Cecil Andrus: "We have to tell the Bonneville Power Administration and the Army Corps of Engineers that they've had a microchip in their head on how to run the river. That should be removed and replaced with a new chip in which you say, 'You will maintain this river for the fish, as well as power generation.'"[25]

It's easy to understand the BPA's concern with drawdowns. Lower the river too much and the Corps would shut down turbines for fear of damaging them at a replacement expense of millions of dollars. During the Reagan/Bush years the BPA came under increasing pressure to sell all the electricity Northwest dams could produce in an effort to generate as much revenue as possible. Reduce hydropower production, the BPA warned,

and the only alternatives would be more coal-fired power plants, increasing air pollution, or more nuclear plants, with their own potential environmental problems.

It is also easy to understand the Corps' reservations about drawdowns. For more than a century the Corps closely allied itself with navigation interests along the Columbia/Snake waterway. When open river adherents sought a solution to the rivers' many navigational obstacles, they looked to the Corps. And when the Corps needed help passing the idea of the massive dam and lock system through Congress, it asked the open river advocates to provide the necessary lobbying power. When ports began to predict economic catastrophe shortly after Idahoans proposed a drawdown, the Corps listened, as it always has, to these navigation interests.

For a time, the ports attempted to pose as fish advocates when denouncing drawdowns, claiming the lower Snake reservoirs provided spawning beds for Chinook salmon and that drawing down the river would eliminate these. Some Chinook do spawn in the main stem, but in numbers insignificant compared to upstream tributary spawners. The real issue was getting fish through the reservoirs to and from more active spawning beds. Taking another tack, the Port of Whitman County's manager questioned, "why we should hurt one kind of fish [bass particularly] to save another?" It was a classic case of comparing apples and oranges. The Port wanted people to believe a fish is a fish, but few people other than port officials seemed willing to stake the lives of endangered Pacific salmon against common warm-water bass. But the Port manager pressed the argument: "We believe that more weight should be given to recreation interests than has been shown to date. Giving more weight to resident [warm water] fish and wildlife resources would help." The Lewiston and Clarkston chambers of commerce took a similar approach in full-page newspaper ads showing dead fish on a dry reservoir bottom. Such a sight, they maintained, would become common during drawdowns. Andrus pointed out that the carcasses in the newspaper ads were trash fish that preyed on salmon smolts. "Not a bad deal," he retorted.[26]

All of the talk about fish, however, was only a subterfuge, and the ports soon retreated to their hard case—the economic impacts of shutting down the river. Immediately, they focussed on a six-month drawdown—something no one had seriously contemplated. Noted the Port of Whitman County, "A drawdown . . . for six months . . . would force a dozen elevator and other firms to abandon their facilities . . . on or near Port [of Whitman]-owned river properties. . . . A drawdown of this

magnitude would not only result in an $18 million loss for these 12 firms but would have a devastating impact on farmers because of the discontinuance of low-cost water transportation for getting grain to highly competitive markets overseas."[27]

A six-month drawdown would bring economic turmoil. But the ports had created a strawman. Champions of the Idaho plan proposed drawdowns lasting two months. Since the river system already shuts down two weeks annually for lock inspections and maintenance, the Idaho plan added only six weeks to this schedule—a proposal that probably did not endanger any ports or permanent jobs, especially since lower Snake barges do not ship perishables. The ports would suffer some financial losses and should be compensated for them, said the drawdown adherents. In the words of the outspoken Ed Chaney, "Port districts are a public welfare system already. They would not exist were it not for federal construction of dams and locks and continued federal assistance that allows barges to move goods toll-free. So let's write them some more checks. The net social benefits with fish will exceed the net social benefits of not having fish." But this concept, of course, cuts across our ideological grain: tell a port official that she or he lives off welfare and you'll hear more than mild remonstration.[28]

In one of the most objective analyses of the drawdown idea, economists from the University of Idaho, Washington State University, and Oregon State University concluded there would be economic ramifications with a two-month drawdown: farmers living closest to the river with fewer shipping alternatives would suffer, and port districts might not enjoy continued expansion. Nevertheless, the economists concluded that only 5.4 percent of the wheat shipped from Portland to international markets arrives from the lower Snake during the two months proposed for a drawdown and that Portland could meet export goals during that time with shipments from other sources. Further, some people would gain financially by the drawdown, particularly railroads and truckers. The drawdowns might, in essence, be an economic wash. "We conclude," they wrote, "that shippers who presently depend on the Lower Snake ports are likely to be very creative in modifying the time and mode of their shipments in response to any drawdown of the river. They have a strong economic incentive to do so. These market-driven adjustments are likely to mitigate some of the impact of a river drawdown. Those estimates which predict devastating impacts on the region's shippers should be seen as exaggerations or negotiation postures."[29]

In the short run, the ports lost their battle. Faced with public and political pressure to save fish, and with the recommendation of the salmon summit and the Northwest Power Planning Council that it try the Idaho plan, the Corps in 1992 agreed to an experimental drawdown to determine its effects on dam equipment, river banks, roads, marinas, ports, and other facilities along the lower Snake.

In March 1992 the Corps began lowering the river behind Lower Granite Dam, dropping the reservoir two feet a day. By the end of the month the Snake had sunk thirty-seven feet. Freshwater mussels, carp, bass, cars, fishing equipment, soda machines, an airplane, human remains, cash registers, guns, house foundations, old railroad beds—all lay exposed in vast mud flats. All of that proved interesting to visitors, but what concerned port and governmental officials more was the cracking of road pavements, marina docks left stranded on beaches of muck, and eroding river banks—all in all, a loss of $1.3 million in damages. "If this keeps up year after year, you can kiss shipping goodbye, you can kiss agriculture goodbye," fumed Port of Clarkston commissioner John Givens. Not necessarily, countered former Idaho Fish and Game commissioner Keith Stonebraker. Ports in the Midwest annually shut down several months for winter weather and dredging, yet shippers and ports there manage to thrive. "I don't think these people are any less capable."[30]

Faced with no politically palitable alternative, Cecil Andrus continued to encourage drawdowns as the only feasible solution to the lower Snake fish crisis. Andrus would willingly incur the wrath of a few Idaho port officials and navigators. He would not irritate Idaho irrigators.

If the Pacific Northwest economy depends upon inexpensive hydroelectricity and an open Columbia/Snake riverway, it also relies on agriculture, and in a dry country—for only that fraction of the Northwest lying between the Cascade mountains and the Pacific Ocean matches the regional stereotype of a land of abundant rainfall—agriculture means irrigated crops. Millions of Northwest acres receive their water from irrigation and annually produce crops valued at more than $2 billion. These crops account for five of the top ten products exported from the Columbia River. Agriculture also provides the Pacific Northwest with its positive balance of foreign trade. In Idaho, irrigation enables the state to rank third in the nation in production of sugar beets, hops, and mint; second in barley; and first in potatoes. Idaho ranks fourth among states in water used for all purposes, behind only the huge states of California, Florida, and Texas. Idaho easily leads the nation in per capita use of water—about

nineteen thousand gallons per day as opposed to a national average of two thousand. Writer Tim Palmer has noted that Idaho "has the highest rate of [water] use on the planet, by far." All but a small portion of it goes to irrigate crops. Indeed, Idaho is the nightmare John Wesley Powell feared. Powell, one-armed director of the U. S. Geological Survey, authored one of the classic (although too-often ignored) documents of nineteenth-century Western history, *Report on the Lands of the Arid Region of the United States*. Powell well understood that only a fraction of the West's land is really suitable for irrigation, but boosters ignored his pleas for sanity, and the Reclamation Bureau, in states like Idaho, went on an irrigation binge. It dammed far too many rivers and drained far too many aquifers, all in an effort to produce subsidized crops that often found a market only as surplus commodities. Irrigation, despite Powell's warnings, today accounts for 80 to 90 percent of all water used in the West, and much of that, in Idaho and elsewhere, is sadly wasted. The irrigated West of the 1990s often lacks logic, but the irrigation society has many powerful adherents, and for a governor like Cecil Andrus to mess with Idaho irrigators—folks like Sherl Chapman and the Idaho Water Users Association—is to invite political suicide.[31]

The Idaho Water Users Association consists of more than 125 agribusinesses and municipalities and 130 irrigation and canal companies. Chapman is the group's executive director, and his association came on board the drawdown plan early because it moved the focus of creating more velocity from upstream Idaho irrigators to downstream ports. "Downstream interests in Washington and Oregon are saying we need to add much more water to the Snake system from Idaho. This also seems to be the mindset of the National Marine Fisheries Service as they attempt to deal with endangered and threatened species," Chapman said a few days before the 1992 drawdown experiment began. "So we hope the drawdown works. It might save Idaho agriculture."[32]

"If you drained every reservoir in southern Idaho you'd only get about half of what the biologists say they need to flush smolts to the Columbia River," he went on. "And you would eliminate three million acres of irrigation in Idaho." And then Sherl Chapman begins to sound something like Kent Martin, the Skamokawa fisherman: "If you don't want Idaho to go back to sagebrush, then we can't eliminate irrigation. We've got a lot of people saying we can eliminate irrigation. We have national crop surpluses, so we can bring in light industry and tourists instead of having agriculture. But light industry is very polluting and tourists are not going to come to a

desert. Idaho has the quality of life it has primarily because of irrigation."[33]

Just as much as Idaho irrigators wanted the drawdown to work, navigators and port officials sought to defeat the idea before giving it a chance. They threatened lawsuits; they complained to Congress; they poured out thousands of dollars worth of negative publicity. And they proposed alternatives—none of them novel. Crank down on commercial fishing, they said; improve hatchery production; barge more fingerlings. To a fish advocate like Ed Chaney, those all seemed like tired and unworkable suggestions. In December 1994 the Northwest Power Planning Council, reacting to the 9th Circuit Court of Appeals ruling earlier that year that the council had done too little to fulfill its salmon preservation responsibilities, tried to reach a compromise. The council agreed with the idea of an immediate drawdown of Lower Granite's pool, with other reservoir drawdowns to be phased in over several years. Yet even this 6-2 compromise decision seemed unlikely to end the controversy. Seven of the Northwest's eight United States senators immediately criticized the plan. They argued instead that biologists conduct more studies, a scenario that could literally study the salmon to death, conveniently and finally ending the controversy. And a Republican, Phil Batt, won the governorship of Idaho in the 1994 elections. He pledged to appoint planning council representatives more friendly to navigation interests. The 6-2 majority seemed soon to become a 4-4 deadlock just as one of the region's most powerful salmon advocates, Cecil Andrus, lost his political influence.[34]

As of this writing the region has yet to reach a final decision on drawdowns. At a time of increasing concern over federal expenditures, however, it is easy to see the attraction of barging. The Corps estimated it would cost between $1.3 and $4.9 billion to retrofit its four lower Snake dams to safely pass fish in drawdown conditions—figures that dwarfed the dams' original construction costs and flabergasted many observers. They so flabergasted Cecil Andrus that he hired his own analyst who concluded that the Corps' estimates were at least twice as high as actual retrofitting would cost. Even so, all agreed changing the dams would be expensive. On the other hand, the Corps spends a comparatively piddling $2.2 million annually on its juvenile fish transportation system. The ports eagerly publicized this economic imbalance to advocate barging over drawdowns, especially since biologists had been unable to empirically demonstrate that drawdowns would help fish. But most biologists agreed on one thing: increased emphasis on barging wouldn't help the fish, either. Indeed, a team

of experts assembled by the Columbia Basin Fish and Wildlife Authority went so far as to say barging imperilled them. As Ed Chaney noted, the Corps has been hauling more and more fish in this unnatural way each year, but the numbers of salmon surviving to adulthood continues to dwindle.[35]

The drawdown was not the only fish-saving proposal outlined at the salmon summit or in public hearings before federal agencies. It was merely one of dozens. In its complexity, however, in the number of interest groups on all sides of the issue, the drawdown proposal exemplifies the difficulty of resolving the fish crisis in the Northwest, the problem, as Ed Chaney put it, of dealing with infinite "boxes within boxes."

For those people bent on deflecting public opinion away from drawdowns, increased hatchery production became the key suggestion. Hardly a new idea. Nonetheless, as the Northwest faced the endangered species threat in the 1990s, alliances made up of port officials continued to advocate hatchery production. But by then virtually all biologists had come to believe that, while hatcheries played a role in preserving runs, over-reliance on them had to end.[36]

In the mid-1970s, forty-four hatcheries in the Columbia Basin annually produced 151 million salmon and steelhead smolts. The hatcheries contributed about 50 percent of the adult salmon and steelhead then in the region's rivers. With the addition of the nine Lower Snake River Compensation Plan hatcheries, along with several others, by 1992 hatcheries annually produced nearly 200 million fish and hatchery stock had come to comprise 95 percent of coho runs, 70 percent of steelhead, 80 percent of summer chinook, 70 percent of spring chinook, and 50 percent of fall chinook.[37]

In a typical hatchery, fish grow in concrete tanks, usually segregated by size, in dense concentrations, under unnatural light and temperature—not all that different from feedlot cattle or hothouse plants. They eat a specially prepared meal and get used to the humans who toss it to them. Under these conditions fish rushing fastest to the food survive and prosper. When released into wild streams the fish that possess these characteristics seldom survive. Rush to food without looking and a fish can suddenly become predator fodder; dart around willy-nilly after food and fish soon run out of energy. Biologists discovered other problems with hatcheries. Fish raised *en masse* proved prone to diseases that could wipe out millions

at a time. And survivors could spread the malady to other fish once they began mingling in wild waters. Hatchery fish, raised in convivial conditions, also proved less able to survive the rigors of nature. In other words, while hatcheries produce millions of fish a year, relatively few survive. About 8 percent of wild fish live to spawn; only about 2 percent of hatchery fish last that long. Even more important, since hatchery fish compete with wild strains for food and space, biologists fear a drastic reduction of the salmonid gene pool.[38]

By the 1990s biologists had seen enough. Robert Francis, director of the Fisheries Research Institute at the University of Washington, wrote that hatcheries "have become a narcotic served to pacify society." Even a Corps biologist like Sarah Wik came to recognize the downside of overzealous hatchery production: "We learned the hatcheries can't solve the problem. It's a big puzzle. You have to look at all the pieces. If you look at one piece and not the other, you can't solve it."[39]

But, in the best boxes in boxes tradition, no one wanted to eliminate hatcheries either. James Lannan, a salmon geneticist at Oregon State University, derided the idea that Northwest wild stocks are "somehow wonderfully adapted" to the region's rivers after thousands of years. "Their previous evolution is irrelevant," he claimed. "The conditions they evolved in no longer exist." And even Bill Bakke, whose Oregon Trout was one of the organizations that petitioned for endangered species protection for Snake River chinook, agreed hatcheries would play a role in preserving Northwest fish runs. "Hatcheries are not undesireable," he said. "They just need to be operated better within the ecosystem as a whole." Among the practices biologists wanted to eliminate was the hatchery tendency to select only the largest fish for brood stock and to select those fish that arrived first, a practice undertaken in good faith to ensure adequate egg takes and to allow the fry to hatch earlier, begin to feed earlier, and thus enjoy a better chance to grow to larger size before release. Now fish researchers want hatcheries to take eggs and sperm from a much larger number of brood stock, stock as diverse in size and time of arrival as possible in order to insure the greatest diversity.[40]

The Northwest Power Planning Council adhered to the biologists' concerns in its 1992 comprehensive plan for salmon survival. It asked agencies to study the juvenile fish-carrying capacity of the Columbia River system to ensure that hatchery releases did not exceed those limits; to work with geneticists to sustain the diversity of salmon runs; and to improve hatchery practices to assist fish to better survive in natural waterways.[41]

The planning council listened to many other ideas about how to save the salmon. The Bonneville Power Administration at first tried to bluster its way through the endangered species threat. Shortly after the Shoshone-Bannock tribe and Oregon Trout sent in their petitions, the BPA claimed, despite all scientific evidence to the contrary, that declines in chinook salmon runs "have been reversed and are now trending upward." Aware that such reassurance probably wouldn't wash, the BPA also tried threats: declare these runs endangered, it warned, and electricity rates would skyrocket. By the fall of 1990, however, even the BPA could see that people would no longer tolerate either scare tactics or implausable reassurance. So the agency, in what it termed "a major shift in BPA policy and responsibility toward fish" came out with a $3 billion plan to save dwindling stocks of wild salmon. The BPA advocated improved upstream habitat, better-run hatcheries, and—not surprisingly—reducing commercial harvests. Although a relatively small part of the proposal, the idea that drew the most attention was BPA's plan to pay bounties for catching squawfish, voracious salmon smolt predators.[42]

The problems predators like squawfish would cause once the rivers became reservoirs really did not surprise biologists, although development agencies like the Corps and BPA ignored early warnings. Noted the U. S. Fish and Wildlife Service as early as 1963 in commenting upon the effects of slackwater created by Little Goose Dam: "Populations of nongame fish are expected to increase in the reservoir within a few years after initial filling. Competition between game and nongame fish populations for food and space will increase. Increased predation on the young of game fish by nongame fish will occur. This situation will detract from the sport fishery, and also create fishery management problems."[43]

Squawfish are native to the system, and in the days before dams they played a roll in keeping populations of other fish—even salmon—in balance. But the reservoirs created an ideal situation for the predators, who like to sit near a dam and capture young smolts emerging confused and disoriented from the turbines, spillways, or bypass systems. The BPA proposed to spend $5 million or more annually on squawfish control. It would pay professionals to fish eight-hour days at Corps dams, Indians to catch the fish using long lines of hooks, and sports anglers for each squawfish they brought in. "The squawfish bounty is part of the equation," says Kent Martin. "But it is still a smoke screen. We're putting money into this bounty program that could be spent on the *real*

problems." Still, the power planning council agreed with the BPA and proposed to reduce squawfish numbers by 20 percent.[44]

Idaho Trout suggested building a small canal alongside the Snake and Columbia rivers that would allow young fish to swim past the dams. Scientists at the Idaho National Engineering Laboratory proposed floating a long plastic tube in the water the length of the river system to shoot smolts downstream. Both of these alternatives came with their share of critics. Some wondered if adult salmon would return up a river having gone downstream in a pipe or ditch. Others questioned whether a separate canal or pipe might give the equivalent of *carte blanche* permission to further pollute the mainstem river once fish became isolated. Everyone questioned how to gather the smolts into the canal or tube in the first place, and some, like Ed Chaney, dismissed the whole concept as absurd. "These animals don't just use the river as part of a conduit from point A to point B," he said. "They use it to feed, to reach a certain physiological change from river water to saltwater. . . . This isn't a transportation problem, it's an ecological problem. . . . You can't put elk in a bus and move them to a winter range and hope it works out."[45]

Some people have touted energy and water conservation as potential ways of helping the salmon. The Northwest attempted energy conservation programs in the 1970s and 1980s without abundant success. One reason for their failure is a lack of incentive on the part of power marketers to enthusiastically support the measures. After all, each kilowatt of energy saved represents lost revenue to a power supplier. Too many power companies still urge ever more consumption despite the salmon crisis. However, energy conservation does hold considerable promise.

On the surface, conserving irrigation water along the Snake River likewise seems a plausible way to provide more water for fish. Southern Idaho farmers could convert part of their land to crops requiring less water. Surprisingly, almost three times as much irrigated land on the Snake River Plain is devoted to alfalfa and pasture than potatoes, yet alfalfa and grass take many times more water. Grow spuds in Idaho and hay somewhere else, say the critics. Some go even farther. Noting the dramatic shift of agriculture to the West with irrigation—the South alone saw its cropland reduced by one-third in the twenty years after World War II—historian Donald Worster has called for a national rethinking of agricultural priorities. The East and South have the capability of growing crops such as potatoes, sugar beets, and fruit without wasting precious water. The nation would be better off to cut irrigation subsidies and thus provide an economic incentive for farmers to raise such crops where they do well with natural rainfall. Worster goes so far as to suggest a new "Homestead Act" that encourages farmers to "Go East, young man or woman." More farmers in the irrigated West could convert to sprinkler irrigation rather than the traditional and highly inefficient ditch and furrow system still used by more than half of Idaho's irrigators. Those who retain ditches could line them to prevent water loss through seepage. Farmers could convert to drip irrigation, effectively shown to work elsewhere, and could irrigate their crops using interactive computers that precisely determine the amount and time water is needed. Irrigators could save tremendous amounts of water by simply cutting a few days off the irrigation season without any damage to crops, according to agricultural researchers. These changes in a system that wastes millions of gallons of water daily appear not only doable, but also cheap compared to some other solutions suggested for assisting fish. That is, until a person starts talking to those with a vested interest in protecting Idaho irrigators."

It soon becomes apparent that irrigators do not want to talk seriously about conservation. "You can conserve all you want, but you are not adding water to the system," says the Idaho Water Users Association's Sherl Chapman. "The only thing conservation can do is affect timing." Seconds Keith Higgenson of the Idaho Department of Water Resources, "Conservation is not a panacea. Making the Idaho farmer more efficient is not the solution." And then both quickly come around to an argument that is, at best, curious to the uninitiated. It goes something like this, and if its logic at first escapes the outside observer, it is the Holy Grail of arguments to Idaho irrigators: it is important that we pump more water onto irrigated lands than the crops require because this water seeps into the aquifer. To stop "wasteful" irrigation might dry up the aquifer.[47]

The Snake River aquifer is huge, among the world's most productive. It runs as much as nine hundred feet beneath the surface and roughly parallel to the river. Groundwater from the aquifer irrigates about one-third of Idaho's farms, and irrigation accounts for 95 percent of Idaho's groundwater use. As early as 1960, the Bureau of Reclamation—often thought of only as an agency that manipulates surface water through dams and canals—had sunk 170 wells to tap the aquifer, and private individuals had drilled hundreds more. Groundwater pumping continued to increase. Today, approximately 8 million acre-feet of water is pumped out of the aquifer annually, with about 7.8 million acre-feet flowing in. The argument from Idaho irrigators is that they help the aquifer by taking excess water

from the Snake River, overwatering their crops, and allowing what's left to revive the underground supply. "The Snake River aquifer is largely recharged by irrigation leakage," claims Chapman. "So if you seal up everything, then you don't replenish the aquifer." It is a curious argument, and leads one to question how the aquifer got along so well for so many years before irrigators moved to Idaho. But it is repeated relentlessly by irrigation interests in the state. Says Higgenson, "Downstream irrigators use water that seeps into the aquifer from upstream irrigators. So the excess water put on crops is not wasted. If we conserve water upstream, we affect downstream users because there will be less water in the aquifer. Excess irrigation water is not 'lost.' We say we will support conservation if it can be done without hurting others." Indeed, Idahoans pump so much river water that the mighty Snake virtually disapears at Milner Dam. It reappers again only at the Thousand Springs area, courtesy of discharges from the aquifer. In other words, irrigators essentially pump the river dry. Then they justify their excessive water use by claiming their waste recharges the aquifer. Further, they state, if the aquifer were not so robust from all that irrigation overflow, it could not replenish the irrigation-drained Snake. Only Idaho irrigators and politicians fail to see the absurdity.[48]

The "others" Higginson worries about hurting, of course, are Idaho irrigators, not downstream interests along the lower Snake and Columbia rivers, and certainly not salmon. The premise of Higginson's argument against irrigation conservation is that using less water will damage the aquifer. But the argument taxes logic. In the first place, if the aquifer requires replenishing, there are more effective means of replenishing it than pumping too much water onto crop lands—where some water evaporates and therefore is "lost" to the system. Second, if Idaho irrigators wasted less groundwater, the aquifer would not need replenishing. Third, water that escapes southern Idaho is not "wasted." "From Idaho's standpoint, water is wasted when it flows under the Lewiston-Clarkston bridge" into Washington, says Higginson. This ethnocentric argument fails to recognize that the Snake and Columbia need vital downstream flows to remain biologically viable. Higginson's rationale is the same as the thirsty southern Californian who longingly looks at water rushing out the mouth of the Columbia and claims it is merely "wasted," hoping to turn the Columbia into another Colorado, a river pumped and dammed so excessively that it now dies in a sandy desert before reaching the ocean. Fourth, although they speak softly about it, even people like Chapman

and Higginson admit that conservation can affect the timing of water releases from upstream reservoirs. This timing can make all the difference to juvenile fish. If a little conservation saves water that can be forced downstream in the spring, it could very well significantly benefit the entire system. Finally, the argument ignores the fact that Idaho irrigators raise excess crops that the nation does not need. At the very least, farmers elsewhere could raise these crops without irrigation. Should we extinguish a species of fish so farmers can continue to raise surplus commodities?[49]

As an alternative to irrigation conservation, people like Higginson would like to build more dams "just for the fish." Idaho irrigators could keep all their reservoirs. Meanwhile, dam builders would create some additional reservoirs in the state's few undammed areas strictly to store a water supply to help flush fish to the ocean. The Corps and Bureau of Reclamation love this idea, although they do not talk about building more dams in their public meetings and publications. Instead, in bureaucratic double-speak they state that "additional upstream storage" could benefit the fish. But in an irrigated kingdom like southern Idaho that so far has found no way to ease its thirst for ever more water, one can only suspect that water set aside for "wasting" on fish would soon be appropriated by irrigators. Beyond that, even the thought of more dams, for whatever purpose, flies in the face of the contemporary political climate. "Upstream storage" advocates must have been dozing for the past twenty years if they believe they will once again get to build dams on Idaho streams.

Many other proposals have been and will be suggested to assist fish. The Corps, the Bureau, and the BPA, for example, studied ninety alternatives under their 1992 systems operation review. And, of course, various organizations and agencies have already tried many fish-saving ideas. On the Umatilla River, a tributary of the Columbia that enters below the Snake, volunteers painstakingly attempted to create better fish habitat by super-gluing logs to rocks. While that experiment was more exotic than most, by 1990 the Corps and BPA spent about $100 million annually on preserving fish runs. Regardless, the salmon runs have continued to decline. Some people began to worry that the costs of preservation might threaten the region's economy, in which case environmentalists might lose their chief ally in the fight to save salmon: public opinion. "People want to

save the salmon in the abstract," claimed Washington's Republican Senator Slade Gorton. Gorton wants to modify the Endangered Species Act to include economic as well as biological considerations prior to listing. "We need a serious discussion of the costs of saving that species," he says. Stated Tom Trulove of the Northwest Power Planning Council, "The worst thing you could do for salmon is something so radical that you ruin the economy and lose the support of the public."[50]

To a biologist like Steve Pettit of the Idaho Department of Fish and Game, salmon are worth the economic investment. "These fish are the canaries of the river," he says, alluding to the miner's safety tocsin. "If the river isn't fit for fish, it won't be fit for humans. I hope people are willing to pay to have salmon in Idaho. Most people come to the Pacific Northwest for the quality of life, and that includes having wild species, like salmon, in our rivers." People also come to the Northwest because of affordable living—traditionally dependent upon cheap hydroelectricity. And even a few biologists have begun to question whether saving wild salmon is worth sacrificing Northwesterners' standard of living. "I'm not sure the cost of preserving these fish is going to be worth it," says Eastern Washington University fish biologist Allan Scholtz. Some local politicians are following that lead. "Why not just abandon the fish?" asks Idaho legislator James Lucas. "Give it up as not worth the costs? Why is the fish vital to the South Idaho farmer?"[51]

That kind of talk leaves a lot of fish advocates, who have lost battle after battle along the lower Snake since the 1930s, feeling pessimistic. "In 1980, Congress gave the Northwest Power Planning Council a mandate and a blank check: 'Save the Salmon,'" laments Ed Chaney. "But more than a decade later, we have nothing. They spend money and the fish keep dying. It need not be that way. It is difficult not to be cynical. Having been through five or six 'Save the Salmon' campaigns, I don't think we have the will to save them. The aluminum industry, barge operators, the BPA—all create a culture too powerful to overcome."[52]

Chaney places his survival hopes on the Endangered Species Act and its authority to force the Northwest's most powerful economic institutions into a new way of doing business. But many congressional representatives from the Northwest and elsewhere are plotting ways to weaken it. The act might have had smoother sailing had the Northwest not faced both a spotted owl and Snake River salmon crisis simultaneously. In other words, the act regional environmentalists used to help preserve species has aroused so much publicity and controversy that the federal government now might

weaken it. History along the lower Snake River has never played itself out in a vacuum. From the time of government explorations to the time of government dams, what happens in Washington, D. C., has always impacted the region. And now the Northwest sees that history is a two-way path: reactions to the Snake River salmon crisis influence national politics.

After spending billions of dollars to save salmon will politicians say "enough," and abandon the fish along with the Endangered Species Act? That possibility greatly concerns Ed Chaney. What bothers him more, however, is the thought that we will continue to whittle elegant species to death because we have neither the desire to sacrifice to the extent necessary to allow them to thrive nor the courage to say, "Kill them." "If we won't do what is right, then let's close the fish ladders at Ice Harbor Dam and give the fish an honorable death," he says. It is an important issue with him. "If we are going to kill them, let's not do it with phony data and press releases. Let's quit lying to the public. Let's quit pissing away public money. The honorable thing is to have a last salmon feast and kill them. The fish have done so much for the Northwest that they deserve this. But the bureaucracies responsible for the fish crisis are gutless. So they will grind the fish to death slowly."[53]

Ed Chaney is a pessimist, but he is also a realist. If we are honest, we must admit that we are slowly grinding the fish away. We've spent millions of dollars but the fish continue to die. Nothing has worked so far, and one gets the feeling that the Endangered Species Act is the salmon's Armageddon. If we fail this time, it well might be too late to save them. It is an issue with the potential to touch every person in the Northwest, not just the Kent Martins, Cory Eagens, Ed Chaneys, and Eldon Crisps. The question Northwesterners face for the first time in the region's history—both individually and collectively—is whether or not they are willing to save the salmon. We've paid lip service to sacrifice until now and the salmon has managed to survive, only because it is an incredibly strong and adaptable fish. But it has nearly reached its limits. The question now is whether the preservation of a species that we could survive without is worth real cross-societal sacrifice.

Epilogue

After waving goodbye to Ed Ferrell on the fish barge and climbing up the navigation lock on that spring evening when I rode downstream from Lower Granite Dam, I got in my car and started the drive back to Pullman from Ice Harbor Dam. It was by now past midnight. The trip down the lower Snake on the tug *Idaho* had taken twelve hours. The same full moon that had lit our path through the Snake's canyons now shown over irrigated fields of asparagus and onions and potatoes on the outskirts of Pasco. I had plenty of time to reflect on the river and its salmon on that quiet drive home along isolated country roads.

I found it virtually impossible to consider anything new about the Snake River and its salmon, anything beyond the thousands of pages of newspaper articles, magazine essays, public hearing transcripts, and governmental studies devoted to these topics since the 1930s. Of all the pages I had read and of all the opinions I had heard in the years researching this topic, one phrase came to mind. It surprised me, for a politician with whom I seldom agree uttered it. Yet I thought about how it was perhaps the only topic concerning the Snake that has not seen enough ink; has not been contemplated sufficiently. "People want to save the salmon in the abstract," Washington Senator Slade Gorton once said. But they do so without considering the disruption to lifestyles that salvation might bring.[1]

I liked to believe I had done some serious speculation about the potential human consequences of saving salmon. I had spoken to commercial fishers who might lose their livelihood and be forced off homes occupied for generations. I had discussed the issue with port employees and tugboat

crews who faced seasonal layoffs if politicians opted for annual river drawdowns. I had interviewed irrigators who might lose water rights. I had spoken to wheat farmers concerned about increasing freight charges in an era when the price they receive for a bushel of crop sometimes does not equal the expense of harvesting it. I had chatted with senior citizens on fixed incomes fearful of hydroelectric price increases. I had considered all of this and still come down in favor of the salmon.

But then I admitted, on that nighttime drive through eastern Washington, that Gorton was right. Even after talking to these people and thinking about their stories, I was still only ruminating in the abstract. As I probed deeper, I began to wonder if I really was willing to save the salmon. Some people say we have sacrificed too much for the fish already, that we have invested hundreds of millions of dollars that could have been better spent. They are wrong, however, on at least one count. We have not really sacrificed at all. We paid for all those fish-salvage efforts while continuing to enjoy the cheapest electricity in the nation, while continuing to support, at little personal expense, a huge toll-free navigable waterway. We have not even begun to make the regional lifestyle changes that might actually be required to save these fish. And if we are too afraid to even discuss such sacrifices, it is safe to assume we will not undertake them. I realized that I was guilty as charged by Senator Gorton.

As much as anyone in the Pacific Northwest, I am a child of cheap electricity. My father rode the rails of freight trains from North Dakota to western Washington during the Great Depression. He sought an opportunity to make a living, something impossible on the dust-swept family farm he left behind. He arrived in time to join the work crews that helped Franklin Roosevelt fulfill his dream of constructing the great Bonneville Dam, a dam that would revitalize a depressed economy. For our family, that dam became much more than an abstract beacon of hope and pride. For when workers finished it, the Alcoa Aluminum Company chose Vancouver, Washington, as the site of the Northwest's initial aluminum plant, and my father was among the first employees through the door. He worked there for nearly forty years. That huge power-guzzling plant along the Columbia River and the dam that fed it electricity were significant icons in my formative years. We lived in an all-electric house and we owned a farm where a boy could roam to his heart's content and we ate

good food and we wore new clothes and we took vacations. All of that we owed to cheap hydropower and the dams that had made so many dreams come true in the Northwest.

In those days, if someone had asked me if we should sacrifice my father's job so that more salmon could make their way to Idaho streams I would have laughed at the absurdity of it. My parents were proud of dams and electric power lines and massive industrial plants like Alcoa. They had helped, in their way, to bring such development to the Northwest, and they admired the way the place had taken shape. They knew well the limited prospects for raising a family the country had offered before the dams. But my father grew up on the near-empty plains of Dakota and my mother in the isolated wheat country of eastern Washington, and they also instilled in me an appreciation for unsettled land and unteathered animals and the abundant fish we still then enjoyed. In those days of growing up in the 1950s and 1960s, it never occurred to me—or probably to them—that we would not always enjoy both nature and development. My parents had told me stories of pitch-forking salmon along a small stream near our home, salmon so bounteous that you might, indeed, have walked on their backs. That abundance influenced my childhood, for I had seen salmon rolling thick in spawning streams; they were a part of the Northwestern mythology I grew up with. It would have seemed absurd to question whether we wanted jobs or salmon not only because we were confident in those days of the primacy of people over fish, but also because we really believed we would never have to choose. It seemed to us that we could have both—indeed, the Army Corps of Engineers told us we could have both—and that was part of the beauty of living in the Northwest in those years, part of the attractiveness that has lured so many people to the region since.

Alcoa not only bought our clothes and paid for our food and gave us a house, but when it came time for me to go to college, Alcoa also provided me with a scholarship. So, at eighteen I set off for school, and while I doubt that I seriously thought about it, had anyone asked, I could have then given a long litany of reasons why we needed dams and cheap electricity and plants like Alcoa. I literally owed my life to them. But I landed in college at the dawn of what we now think of as the modern environmental era; my first year in school I attended the teach-ins during Earth Day commemorations. And my thinking, partially formed by an Alcoa-paid education, began to gradually shift, so that I have now reached a point where my family refers to me—sometimes charitably and sometimes

not—as an environmentalist. I have never been a man-the-barricades type of environmentalist, but I think the label is appropriate to me, as it is to many members of my generation. We have learned to view the world through different lenses than our parents.

So, my immediate reaction to Slade Gorton's challenge was, "You are wrong. I have contemplated the issues; I have studied them. There is nothing abstract in my views. The salmon must continue to run." As I wrestled with the subject, however, I discovered what a safe response that was. My father had long since retired from Alcoa; he no longer required its wages. I knew port employees and commercial fishers and irrigators who might be forced into serious financial sacrifices. I thought of myself as sacrificing, too. I was willing to pay higher electricity rates to save the salmon. But I had to confess that I was still dealing in the abstract. My sacrifice would be minimal; my decision, therefore, easy.

But what if that sacrifice became greater? What if we, as a society, opted for a total save-the-salmon effort that turned out to be as disruptive and expensive in the short-term as port officials and power companies would scare us into believing? What if freight rates climbed so high that, combined with slashes in agricultural price support programs, Palouse farmers went bankrupt and, with their money removed from my community, drove many businesses into bankruptcy, forcing people to leave, lowering the tax base, gutting the public schools we rely on for our childrens' educations? What if electricity rates skyrocketed so that our town's university, the one where I had learned environmental consciousness and that now employs me, had to make layoffs to meet spiraling expenses during an era of state budget cutting? What if I lost my job and could no longer support my family and had to move from this rural area in which we have chosen to live precisely because it is still possible here to savor natural abundance while enjoying the economic prosperity that the dams have brought?

Now I was no longer thinking in the abstract, and suddenly I had no quick retort to the question of how much sacrifice we should endure in order to save fish.

As in other endangered species confrontations, part of the problem is that we have placed an economic value on flaura and fauna in order to weigh the costs and benefits of saving it. When the snail darter temporarily blocked Tellico Dam or when forest products firms fought measures to

save the spotted owl, economics came down clearly on one side of the debate. The darter and the owl have no economic value. We chose to build the dam at the expense of the darter; we are still leveling ancient forests at the expense of the owl. There are many writers and philosophers who tell us that this is all wrong; that until we forego our tendency to save only those species with potential value to humans—be it economic, medicinal, scientific, or other—we view the world with impaired vision. Other species have a right to exist whether or not they have utility for us.[2]

Historian Richard White laments the fact that we have reduced the rivers and their fish to benefit/cost ratios, that we have given fish a price tag, that we have come to view both salmon and kilowatts as commodities. Indeed, one of the earliest, most passionate, and most influential pleas in defense of the salmon came from Oregon naturalist William Finley in the 1930s. By couching his arguments in cost/benefit terms, Finley laid the foundation for what has since been a largely economic discussion. Regardless of White's lament, Snake and Columbia river salmon exist today precisely because they have economic value. If salmon provided no economic benefit, commercial and sports fishers would not have insisted upon functional fish ladders at Bonneville Dam, and the Columbia/Snake fish runs, except for those below Bonneville, would now be extinct. End of controversy. Today, commercial and sports fishing in the Northwest comprises a billion dollar annual industry (at least in years when fishing is allowed), and it provides about sixty thousand jobs. A good part of that business depends upon getting fish over the eight lower Columbia and lower Snake dams. Economics always has been and always will be part of the equation when dealing with salmon.

Yet an economist viewing this issue would find something askew. Economic logic would indicate that decisions on the Columbia/Snake system should have been more two-dimensional, that two large economic forces like salmon and hydropower, even considering both strictly as commodities, should have reached a better balance. We have spent some money on saving the fish, to be sure, but we have spent much more in a pell-mell effort to destroy them in order to create more kilowatts. Economist Phillip Meyer has speculated that throughout the long history of Columbia/Snake development this occurred because dam builders and power planners consistently—and knowingly—understated the value of salmon and "significantly underestimated present [power] capability and overestimated future demand. [Thus] fishery valuation has been conservative, while estimation of power benefits is usually inflated. It follows that

an unbiased decision-maker, considering the value results of such calculations . . . would conclude that fish must give way to power on each occasion." Which is what has happened.[4]

That is not the whole story, of course. The history of how we came to build the dams is longer and more politically complicated than that. But Meyer's analysis does go a long way toward explaining why we are where we are today. What it does not help us do is chart a direction for the future. For if salmon and hydropower economics were once relatively balanced, that balance is now totally askew. The salmon still is no snail darter; a billion-dollar-a-year industry has some economic punch. If we are to decide the fate of the salmon on economics alone, however, the fish is doomed, for the salmon industry today is a tiny drop in a huge bucket of Northwest economy fueled largely by inexpensive hydropower.

So the real decision will come down to sacrifice and our views about our responsibility to nature and to our children. These are topics we are still uncomfortable discussing; it is difficult to stand up in a Corps of Engineers public meeting and spout phrases like "we have a moral obligation to save all plants and creatures, great and small." That is not a quantifiable argument, and the Snake/Columbia river is now a series of reservoirs largely because of quantifiable decisions made by people who crunched numbers and found economic benefits at the end of their equations. If we are serious about saving the salmon we must find a way to leap this intellectual chasm; we must wean ourselves from the comforts of quantification. We must, as historian Donald Worster has said, stop viewing a river as a commodity "bulked here as capital to invest some day, spent freely when the market is high." We must adopt a water ethic like the land ethic Aldo Leopold proposed, one that views a river as the lifeblood of the land. Roderick L. Haig-Brown provided a model for this viewpoint as early as 1946. His book about Columbia River salmon, *Return to the River: A Story of the Chinook Run*, saw the fish as a symbol essential to the spirit of Northwesterners, despite any economic value salmon might have.[5]

To many Native Americans who have and continue to live near the rivers, the salmon have always had both economic and spiritual value. From California to Alaska and inland as far as the salmon swam, native residents developed beliefs about the fish that were remarkably similar for peoples so widely scattered. The salmon appeared every year, different species at

different times, following a constant rhythm. Native peoples explained this by evolving the belief that the fish were really Salmon People who, most of the year, lived in houses beneath the ocean or in a land across the sea. At the appropriate time they temporarily stepped out of their human form and became fish, deliberately sacrificing themselves in order to feed those who caught them. Once caught, their spirits returned to their homes to await the next year's run. To honor the Salmon People and ensure their annual return, natives of the West developed elaborate rituals. Culture dictated the precise words to be spoken when a fisher caught a fish. Some bands prescribed the method by which to transport salmon to a village. Many groups developed detailed rituals for preparing, cooking, and eating the fish. Most natives returned salmon bones to the river so the Salmon People would not arrive home missing an arm or leg. Native people ate the first fish caught—assumed to be the Salmon Chief who led the Salmon People up the river—at an elaborate first-salmon ceremony and believed that the success or failure of the salmon harvest rested on the respect given this first salmon. Many Native Americans continue to hold the salmon as sacred. Notes Allen Slickpoo, historian for the Nez Perce, declining salmon runs are destroying native culture. "The sense of the loss is like going to church and all of a sudden somebody has removed all the Bibles," he says.[6]

Although I respect Native American beliefs, I cannot fully appreciate them. Yet I commiserate with Slickpoo when he says "The salmon is being destroyed for the convenience of special interest groups. Just because they have special interests I don't feel I should be denied my birthright." Still, I look at Native American beliefs primarily in the abstract: their faith is not mine; we grew up in different cultures. Abstractly I want the salmon runs to continue, partially because of their spiritual value to Native Americans. But to me Indians are something like commercial fishers and Idaho irrigators: their sacrifice would not be mine. I am sympathetic, but if I am to convince myself of the moral necessity of saving the salmon I must find reasons to do so in my own beliefs.[7]

Much of our American value system stems from Christian philosophy and theology. That theology, as it regards people and nature, has seemed clear cut to some who have studied the Bible. For *Genesis* states very early on:

> So God created man in his own image. . . .
> And God said unto Them, Be fruitful and multiply, and replenish

> the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth (*Genesis* 1: 27-28).

But there has been over-emphasis on the "dominion" and "subduing" passages in *Genesis* to the near exclusion of other biblical teachings about nature. Perhaps the Latter-day Saints, who settled both in Utah and abundantly along the Snake River in southern Idaho, carried this view to its zenith among Westerners. Noted Mormon hierarch John Widtsoe during the height of irrigation campaigns in the West: "The destiny of man is to possess the whole earth; the destiny of the earth is to be subject to man. There can be no full conquest of the earth, and no real satisfaction to humanity, if large portions of the earth remain beyond the highest control."[8]

Such a view obliterates the "Christian" characteristics other species exhibit and leads us to question if there is room in Christian ideolgy to accept and appreciate the religious significance of a salmon's lifecycle. When adult salmon swim upstream they make the ultimate sacrifice. They spawn and die so that their children might live, and their bodies float downstream to nourish the river and provide food to other animals—from eagles to grizzlies—who come to the streamside to feast on their bodies. The salmon, therefore, seems to be a sacrificial fish in the most Christian of terms.

Perhaps it is too much to expect dominion theorists to see Christian values in a fish. But at least they should read the entire Bible when developing their views of nature and human relationships to it. Some people have tended to ignore significant parts of the Bible. They tend to forget that it is also *Genesis* that describes the greatest effort to preserve wildlife species ever undertaken:

> Of clean beasts, and of beasts that are not clean, and of fowls, and of every thing that creepeth upon the earth,
>
> There went in two and two unto Noah into the ark, the male and the female, as God had commanded Noah (*Genesis* 7: 8-9).

And what of "For that which befalleth the sons of men befalleth beasts; . . . yea, they have all one breath; so that a man hath no preeminence above a beast: for all is vanity" (*Ecclesiastes* 3: 19).
Or:

> But ask now the beasts, and they shall teach thee; and the fowls of the air, and they shall tell thee:
>
> Or speak to the earth, and it shall teach thee: and the fishes of the sea shall declare unto thee (*Job* 12: 7-8).

And what of that phrase so often used by those who claim humans stand at the pinnacle of a pyramidal view of earth? What exactly does it mean to have "dominion" over other species? Dominion is "the power or right of governing and controlling; sovereign authority: lordship, sovereignty; rule, sway; control, influence. The lands or domains of a feudal lord." There is no doubt we can interpret dominion as domination, as people's intrinsic superiority to all other life forms, just as feudal lords held a superior position to those under their dominion.

But feudal lords—at least those desiring to retain power—interpreted dominion in such a way as to preserve the livelihoods of those over whom they ruled. Survival dictated that they hold dominion over *live* species, otherwise their domain would soon be conquered. Will we have a domain if we continue eradicating the species over which we have been entrusted with dominion? *Genesis* told us to subdue, and any logical person can see that we have accomplished that. There is no place left to subdue. Now that we have tranquilized nature, how are we to perform our role as the earthly species holding dominion?

Are we to interpret dominion as manipulation and exploitation? Historian H. W. Nibley has said, "Man's dominion is a call to service, not a license to exterminate." If "God were to despise all things beneath him, as we do," Nibley asks, "where would that leave us?" We must, as Richard White proposes, move beyond comparing salmon to kilowatts if we are to save the fish; we must learn to value such lives for their own sake, not for what they can provide us. Difficult as it is to envision government bureaucrats making decisions based upon moral reasoning, quite simply that is the salmon's—and thousands of other species'—only hope. For we will never be able to demonstrate that the salmon has more economic value than the water in which it swims.[9]

We have made this leap beyond economics in regards to the eagle, probably for whales, and possibly for grizzly bears. But what of fish? Roger Caras in his book about salmon stated up front, "A fish is not the easiest animal to relate to." As he notes, we enjoy communion with other vertebrates. Many mammals enjoy our touch; birds appreciate it when we feed them. But a fish lives in a mysterious and independent world; it is

happiest having no contact with us. We can admire the tremendous strength, endurance, and survival instinct of the Pacific salmon, as Northwesterners have always done. To save this species, however, we must feel more than admiration. Somehow we have to find a way to move beyond the medieval chain of being that places humans first, all other mammals next, birds below, and so on down to "everything that creepeth upon the earth." That is a social value system destined to extinguish many more thousands of species, including Snake River salmon.[10]

Much hangs on our decision about the fish, most obviously the destiny of the salmon, so long nurturer of and symbol for a Northwest way of life. Then there is the fate of the Endangered Species Act itself. Politicians short on biology and long on demagoguery will continue their efforts to gut that law, using scare tactics fueled by economic and societal cost estimates provided by agencies like the Bonneville Power Administration and the Corps of Engineers, bureaucracies with storied histories of disseminating inaccurate projections. Even beyond the future of the Endangered Species Act in this country, decisions we make along the Snake River have potential worldwide consequences. Americans have long taken a sanctimonious attitude toward preserving nature. It has been easier for us to set aside islands of wilderness than it has for many nations; we have enjoyed an abundance of land, a sparsity of population, and a wealth of money that most world citizens cannot fathom. We have also been duplicitous. While exporting dollars to preserve the Amazon rain forest we blithely go about leveling our own ancient woods. The rest of the world has now caught onto our secret and they are watching. The American example, on the Snake and elsewhere, could be pivotal in worldwide decisions concerning endangered species. We still have reasonable, oftentimes even "cost effective" options here. If we are to convince other nations to defend nature we must first demonstrate a willingness to sacrifice—be it hot tubs or jobs—for our endangered species. As Thomas Lovejoy of the World Wildlife Fund once said, "Our American collection of endangered flora and fauna really represents but part of the forward contingent of a great rush to extinction."[11]

It is hard to figure how to convince society of the need to save salmon; how to instill a sacred feeling that is real and not abstract. But there is some room for optimism. Wallace Stegner noted that Americans have proven themselves "the most efficient and ruthless environment-busters in history." Yet while we were "slashing and burning and cutting our way through a wilderness continent, the wilderness was working on us."

Humans are still a wild species. No dominant beings have domesticated us, and while, as Stegner said, we have come close to domesticating ourselves, there is still a part of each of us, ingrained through millions of years of evolution, that senses an almost mystical attachment to nature. And at no time is this unlearned association stronger than when we stand near water. "Who hears the rippling of rivers will not utterly despair of anything," wrote Henry Thoreau. We emerged from water. Indeed, we are, for the most part, water packaged inside a carton of skin. "As for men," wrote naturalist Loren Eiseley, "those myriad little detached ponds with their own swarming corpuscular life, what were they but a way that water has of going about beyond the reach of rivers?" If we do have a chance of preserving nature, we should be most sanguine about saving our waterways, for our connection to them runs the deepest. And if we preserve our waters, we will also protect their fish.

The key to conserving nature is to make ourselves think of the long term. "It pays to know there is just as much future as there is past," Eiseley once wrote. But there are places, and the lower Snake River is one, where we must douse some short-term fires before we can properly plan for a long-term future. First, we must get beyond the belief that once people have altered a landscape it is no longer worthy of our environmental attention. We need to retain our few remaining wild spots. But we also must learn to live and work with altered spaces. "The conservation movement has . . . concentrated too much on scenic places," Wendell Berry has written. "To preserve only the scenic places is to invite their destruction, either in the process of the destruction of their surroundings, or by the overcrowding of people who have no other places to go." Seconded Stegner: "I am not moved by the argument that those wilderness areas which have already been exposed to grazing or mining are already deflowered, and so might as well be 'harvested.' . . . They are only wounds; they aren't absolutely mortal. Better a wounded wilderness than none at all."[12]

I would say better a wounded Snake River than no river at all. The lower Snake dams have killed fish, destroyed wildlife, and ravaged nature. We domesticated this river in order to ship wheat more cheaply and provide inexpensive hydropower the region did not then need and might not ever need if we practice real energy conservation. We should legitimately question whether we made the right decision when we dammed the Snake. But wistful wishing about a free-flowing river will not bring it back. In the short-run—that is, in our lifetimes—the lower Snake will

undoubtedly remain a chain of reservoirs. We need to live with that fact and make the most of it—for the fish, for the wildlife, and ultimately, for ourselves.

Although we might rather be gazing onto a stream roaring over rapids, we do ourselves no injustice if we can manage to look upon the dammed Snake River and still see some beauty. For if we can find that grace, we will be more inclined to preserve the nature that still exists there.

The lower Snake remains the essential strand in a complex natural web that includes all its tributaries. Under its placid waters swim fish as wild as any. Exterminate this stem, prevent these fish from migrating up and down, and you kill all of the streams in one of the nation's largest river basins, symbolically if not literally. For—well beyond the dammed lower Snake River—there remain the unconfined mountain streams that feed it, places where water foams white in pools and flows through evergreens, below jagged peaks, as it has for thousands of years. There remain spots where moss clings to granite rocks and trails downstream, waving in the current, and where waterbugs skip undisturbed across glassy surfaces. There are places in the mountains where, if you cup your ears, the rattling river takes on a sound distinctly similar to ocean waves and beach wind, a beckoning to the distant sea that, perhaps in some small human way, approximates the unequalled urge that lures three-inch fish to leave this comforting home and journey through hundreds of miles of water to an alien ocean.

And there are still watery pools in these streams where fish take rest in calm water before continuing their struggle upstream; shallows where you can see their silvery sides reflecting sunlight as they slash along. There are places where tiny pebbles, crumbled from boulderous mountainsides, have come to rest in a soft, gravelly sediment that entices a salmon to tail-scoop a nest for her eggs. Part of the mystique of these unspoiled places, hundreds of miles from the sea, is that this special fish, the Pacific salmon, still returns to lay eggs in gravel beds and begin one of nature's most magical stories, a tale of unequalled endurance, strength, and stamina, an inspiring mystery of refinding their exact gravel home after years of journeying thousands of miles in river and ocean, a feat unrivaled by any other animal, including humans.

If we lapse into saying "We have already desecrated this place, let's protect something more sacred," then we have condemned those fish to die. And if the salmon die—the canaries of the Snake—so too will the countless creeks and small ecosystems upstream, because if we kill off the king of the Snake there will no longer be an indicator species of significant economic or symbolic value to prevent us from completely destroying this complex river system.

We must preserve what is left of the lower Snake and its fish because of the long-term consequences of our actions. Most assuredly, this river will not look in the distant future as it does today. How long, after all, will these dams last? The river is already at work washing them away, as rivers do with all obstacles placed in their paths. The Corps, when figuring project economics, plans their dams for fifty or one hundred years, although they believe they should survive longer. But the truth is, no one really knows how long the massive Western dams constructed between the 1930s and 1970s will last. How long will they withstand harsh climates and unrelenting pressures from the reservoirs they back? Metal must some day rust. Concrete must turn soft and crumble. Yet none of the Western dam-building agencies estimated the costs of decommissioning, dismantling, or replacing these structures when presenting their glowingly positive cost/benefit ratios to Congress. Congress did not then and does not now require that information. But it is an issue with which future generations will surely have to grapple.

The Corps of Engineers dislikes such talk. "Man, in fact, does control, or at least constrain, parts of natural processes. The questions . . . are for how long, at what cost, and at what risk," wrote Paul Walker, chief of the Corps' Office of History when he read my comments above. "Nobody is able to predict long-off 'what-ifs,'" seconded Harry Drake, former chief of the Walla Walla District's engineering division. "The life of most structures depends on maintenance, lack of earthquakes and destructive wards. Note the existing Roman aqueducts, various cathedrals and mosques. . . . We do not consider the cost of decommissioning. Neither do we consider such costs for our national capital, our highways, our churches, or even our homes."[14]

But huge floods along the Missouri and Mississippi rivers in the summer of 1993—rivers even more clogged with Corps-built dams than the Snake—should once again remind us that, continued Corps assurances to the contrary, man cannot always control, or even constrain, nature. And while money to maintain dams obviously prolongs their lives, and while the lower Snake dams have been well-kept so far, the issue of a never-ending flow of federal funds to maintain structures in the sparsely populated Inland Northwest is one we should consider. Technology may well provide us with a more reliable, less expensive means of generating

electricity than dams. When that happens, who will support the costly maintenance of aging edifices along the Snake River? Already, the Corps has had to renege on some promises it made about permanently maintaining boat ramps and recreational sites along the lower Snake. "Perpetual" federal recreational funds anticipated at the time of construction have withered. Obviously, there is a qualitative difference between cutting money for recreation and eliminating funds for dam maintenance. But we need to think long term, and as structures age and maintenance costs increase, will the government continue to pour money into the dams?

What will happen, for example, if silt clogs the reservoirs, rendering dams useless?

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 thought Asotin would trap much of this. With no dam at Asotin, the sediments now collect behind Lower Granite. Approximately two million cubic yards of material end up in the Lower Granite reservoir each year, lessening the Lewiston levees' flood control capability and creating navigation hazards. Dredging is the most feasible means of ridding the river of detritous, but dredging is very controversial. Let the channels clog by slacking off on dredging, and the Corps angers tug operators and threatens homes and businesses in Lewiston. Clear the channels, and it potentially endangers fish and wildlife.[15]

If the Corps dumps the dredged spoils on land, it can destroy wildlife habitat. So in the early days the agency created artificial Snake River islands with its dredged materials. That assisted geese, but researchers came to believe it damaged fish. The Corps had only one other alternative: deep-water deposition.

Placing dredged materials in deep river water provided some initial benefits for salmon and steelhead. Upstream migrating adults used the shallower spots to rest and feed, and downstream migrating smolts also lingered there. But deep-water dumping poses potential problems. Will these smolt-friendly shallows also attract predators such as bass and squawfish? Will altering the river bottom disrupt invertebrate life? Will increased turbidity brought 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 to sturgeon of dumping dredge waste in these deep-water holes. 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. 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 wastes brought downstream during spring run-off.[16]

Even if the tests determine that environmental benefits of deep-water disposal outweigh disadvantages, someday all such sites will be filled. Then there will be no alternatives but very costly removal of dredged spoils to land or allowing the reservoirs to silt up.

We must in the future weigh real long-term costs against real long-term benefits before deciding to "develop" a river. It is foolhardy to even contemplate a project with a fifty or one hundred year lifespan without also figuring into those equations what happens when that time is up. Project benefit/cost ratios are now skewed toward construction. Any huge, multipurpose dam should show a profit in a fifty-year time span. It does not take an economic genious to figure how to make those estimates come out in the black, for—after fifty years—the dam is still, relatively speaking, spanking new and working well. But what if we project benefits and costs over a longer period, when dams begin aging and maintenance—or removal—costs rise? Would we come up with the same rosy benefit/cost scenarios that in the past enabled developers to dam virtually every river in America for the "economic good" of the country? Agencies like the Corps are hiding the true costs to society when they do not account for what to do with their dams once they age.

Thinking long term should give us a whole new sense of our obligations to nature. The fact of the matter is that while people have *altered* nature along the lower Snake, it is impossible, despite sophisticated technology and engineering capability, to *control* it. Even the Corps—though they are the last to admit it—cannot forever engineer nature into something it doesn't want to be. 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 again. While we cannot control nature, we can dictate a great deal of its future. When the Snake River adjusts to the Corps' impediments, will the wild fish of the river still remain? That is a choice we will largely determine in the near future, although our decision will affect all those generations that come after us.

That means that, while always thinking long term, we must make wiser short-term decisions than we often have in the past.

In the short run, we need realistic incentives to encourage energy

conservation in the Pacific Northwest. With the nation's lowest electricity prices, it is no wonder that Northwesterners use—and waste—more electricity than any other Americans. We have sacrificed fish and wildlife to inexpensive convenience, and it is time that energy conservation—implemented through a realistic rate structure and serious public education—become something more than a lip-service ideal.

We need irrigation conservation. We must recognize arguments about depleting a river's flow to stabilize an aquifer for the phony excuse to avoid conservation that they are. The Snake River aquifer continues to shrink despite some of the most intensive river irrigation in America. Surely, if we were going to replenish the aquifer with river pumping we would have done so by now. Irrigators must receive educational—and financial—assistance in converting to irrigation methods that conserve water. Some irrigated land must be eliminated in favor of moving agriculture once again to a moister part of the country. And we must place societal values ahead of the values of individual agriculturalists. Nostalgic romance about yeoman farmers have led to immeasurable societal harm in the arid West. Thomas Jefferson's ideal does not work so well in a dry country. There is no logical reason why deserts need always bloom. A good case can be made that cactus and sagebrush sometimes have a greater societal value than do surplus crops that cost taxpayers millions of dollars in subsidy programs while they waste water and destroy fish and wildlife.

We need to halt short-sighted subsidies that cause irreparable harm to the environment. For example, the Bonneville Power Administration should eliminate its practice of offering low-rate electricity to utilities that sell this cheap power to irrigators. In addition to being the West's largest water user, irrigators are the second largest user of electric power in the Northwest, behind only aluminum companies. This practice of providing cheap power to irrigators only encourages wasteful pumping and provides no incentive to conserve. And the BPA should gradually raise electricity rates to fair-market values for aluminum companies, still by far the biggest power users in the region. One economist has projected that it costs the average household in the Northwest $3.75 a month to subsidize aluminum company electricity rates. Raising rates will no doubt force some aluminum companies to relocate elsewhere, and that could temporarily hurt the region economically. But just as we need to focus on the long term, we need also think more in terms of societal good rather than regionalism. It is time to stop sacrificing fish to subsidize an industry that does not pay its own way. We are no longer in the 1940s when BPA

clammored for any industry willing to move in and consume excess energy. It is unfair to continue playing favorites by subsidizing aluminum company profits. America can exist with a few less aluminum companies in the Northwest, with a few less irrigated farms. It can exist if Pacific Northwesterners begin paying a fair price for electricity. Indeed, not only can American society exist in such an atmosphere, it will improve—at least if we truly believe that saving some natural things has value.[17]

We need to stop sacrificing fish in the name of redundant science. No biologist is satisfied with our current knowledge of the complex lives of salmon and steelhead. But organizations such as the Pioneer Ports River Alliance, a lobbying group made up of various Snake River ports and other development organizations, use science as a club. "There is no scientific proof that drawdowns will help fish," they say, insisting that we undertake years more study before attempting any action. That would truly result in studying the fish to death—perhaps literally. Notes biologist Steve Pettit, "The number of fish required for ongoing and proposed mainstem research and monitoring will exceed the total number of fish produced. They'll have to take every damn smolt out of the river and mark them just to study them." We do need to continue studies, for each year we learn more about anadromous fish. But in the meantime we need to be bold, to initiate some activity, if we are to preserve the fish in order to retain some to study. The ports do a societal disservice when they spend thousands of dollars promoting the concept that we do not yet know enough about salmon to take any action. We know that we must increase river velocity when smolts travel downstream. And we know the most cost-effective, least disruptive way of doing that is to drawdown the lower Snake reservoirs. Yet permanent drawdowns hold little hope of saving the salmon unless we speed up the drawdown testing process. According to current plans it will be at least 1996 before the Corps even begins drawdown experimentation on an annual basis, and years of testing will follow that. "The Corps is proposing about 10 years of testing. By that time all the endangered salmon will be dead," criticizes James Baker of the Sierra Club. The Corps will admit to only three years of necessary testing (taking us to approximately 1999), but concedes that completing dam modifications to allow permanent annual drawdowns once the tests are concluded will be "many years in the future." Such delays are not propelled by science, but rather by politics. Port officials, pumping thousands of dollars into negative publicity, have made it politically difficult for federal bureaucrats to move more quickly. But those who oppose the drawdowns are in the

minority and if the drawdown means that we have to pay a subsidy to some ports unable to do business a couple of months a year, then that is what we should do, for society will benefit in the long run.[18]

We need to stop looking for scapegoats. Commercial fishers, for example, have shouldered too much criticism for the salmon crisis. We need to recognize that we all—power users, recreational boaters, ports, irrigators, sports and commercial fishers—share in the death and destruction we have caused.

We need to tell the Corps of Engineers that they exist to serve the public good, not merely to perpetuate their own existence. We—and Congress—need to insist that innovative suggestions be discussed seriously by the Corps, not summarily dismissed as unworkable. Throughout the early 1990s, as people proposed a drawdown, the Corps traveled into the region armed with pessimistic slide shows depicting dire consequences should drawdowns come. The glass was always half empty, never half full. Obviously, drawdowns will only work with modifications to dams. But the Corps for years painted disastrous scenarios of the consequences of drawdowns on existing projects, as if anyone had proposed lowering the river without making necessary alterations. When they did finally agree to examine retrofitting, they pegged an astronomical price to it. We need more optimism and far less pessimism from this agency built upon a foundation of "can do" engineering. Northwest Corps pioneers used to grab onto dreams and turn them into reality. The Corps did not drag its feet when asked to tame one of the world's mightiest river systems. Surely, providing the short-term engineering required to improve fish passage at dams so that a river might be drawn down is an easier task than was damming the Columbia and Snake in the first place. This generation of Corps leadership seems hobbled by bureaucratic lethargy, and it is killing fish and wildlife.[19]

We need to eliminate doublespeak from the Corps and other agencies. We should not refer to slackwater reservoirs as "lakes." We should not call plugging a stream with dams and lining its edges with riprap "river improvement." We should not say we are "enhancing the fishery" when we erect a hatchery to pump out millions of feedlot fish to serve as dam fodder while they compete with wild fish for food. We must stop talking about the benefits of "upstream storage" and begin telling people that this fancy term is really just a metaphor for building more dams. We should stop calling a stream dammed to the limit an "open river." Language counts. When we rely on euphemisms to smooth the very rough edges of

destroying a river, we tend to accept such destruction too easily.

We need to demand leadership, not sound bites, from our elected officials. When someone like Idaho congresswoman Helen Chenoweth panders to certain constituents by questioning why she should take the endangered salmon issue seriously because "you can buy a can [of salmon] in Albertson's," we should question how we can take someone like her seriously. It is true that, in 1994, there was a short-term glut of Alaskan salmon on the market. But Chenoweth's disingenuous statement begs two important questions. First, although there are still salmon in Alaska, should we destroy Northwest runs merely because we can find canned Alaskan salmon in grocery stores? Second, does Chenoweth understand anything about the history of natural resource extraction in America? Her comments sound precisely like early twentieth century timber barons and politicians who knowingly smokescreened people into believing the Northwest had limitless old-growth forests. Now, of course, those forests are nearly depleted. So will we deplete Alaskan salmon runs if all the nation's salmon harvest focuses in that one region, the last tiny remnant of a vast West Coast salmon fishery that once seemed as inexhaustible as Northwest timber.[20]

We need to eliminate some of the "boxes within boxes" in the Northwest fishery. There is such a maze of bureaucracy that no one is in charge. The Corps of Engineers, Bureau of Reclamation, Bonneville Power Administration, National Marine Fisheries Service, Northwest Power Planning Council, Pacific Fishery Management Council, numerous Indian tribes, and state departments of fish and game are just some of the players, with overlapping and often conflicting authorities. In essence the maze has created a leadership void. Not only is nearly everyone afraid to act, no one can legally act without redundant consultation. This failed effort at attempting to control the rivers by "consensus" is perhaps the greatest threat to fish. Governors from Oregon, Washington, California, and Idaho have called for the appointment of a salmon czar, and this might be the only hope the fish have.

We might even need to consider dismantling a Lower Snake dam—an unthinkable possibility until recently. But on the Elwha River in Washington's Olympic Penninsula, the Department of Interior in 1993 recommended removing two dams in order to restore fish runs. Environmentalists in southern Oregon are hopeful of someday tearing down the half-built, unnecessary, and uneconomical Corps of Engineers Elk Creek Dam on a tributary of the Rogue River, a boondoggle leftover from the

grand pork-barrel days that even the Corps has since admitted has no justification. The Oregon Natural Resources Council has called for the removal of fifteen dams in the Northwest. Even Secretary of the Interior Bruce Babbit has uttered what, only a few years ago, would have been unthinkable for a person in his position: "I would love to be the first secretary of the interior in history to tear down a really large dam." It is time to seriously consider the societal value of removing Lower Granite Dam. If the fish had one less dam to cross, would survival rates substantially improve? Would dam removal assist in developing the flows necessary to help smolts over the remaining three dams? Is there any real reason, other than convenience and community pride, that ports could not relocate farther downstream? Lewiston would no longer be a "seaport," but would society as a larger whole benefit?[21]

None of this should suggest that solutions—even short-term ones—will be easy. We must take care of the fish, but we must do so without gutting the economic prosperity that dams have brought. People are willing to sacrifice to protect the Northwest's foremost wildlife symbol. We all should pay higher power rates and there must be some economic shifting—probably a few less aluminum plants in the region, acres taken out of irrigated production, and ports closed part of the year. These are difficult but doable choices. But if we tinker so much that we bring vast disruption to a region built upon these dams' benefits, we will destroy the most important ally the fish have—public good will. Still, if we are to save the salmon, we must be creative. We must take some action and not watch fish continue to die while we lapse into a stupor of bureaucratic handwringing. We have the scientific knowledge to begin taking some action now. As a society, we know what must be done in the short term to save the fish. The only question is whether or not we have the courage to take the necessary steps.

As much as anything, the Snake has become a river of compromise. This river of compromise, reshaped 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; wild fish extinguished and threatened.

Each action of the Corps 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 concessions made.

Each step the Corps took along the river came with debate, criticism, conciliation; also plaudits, praise, awards. The river looked considerably different in the 1990s than the Corps originally envisioned in the 1940s. The Engineers built one less dam than they had planned, 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.

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 in 1980. Its population dwarfed all the Pacific Northwest states combined, as did its energy requirements. Its requests for Columbia/Snake power will continue to rise, and with each demand that dams generate more electricity will come the need to merge power requirements with those of fish and wildlife.

California's increasing population, combined with a long drought, also activated old schemes to divert Columbia River water to the south. For perhaps the first time in the modern environmental era, after people had learned the ecological necessity of fresh water dumping into salt at places like the Columbia's mouth, California politicians, facing meetings filled with irate constituents, spoke again of all that water pouring out to sea as "wasted." Few people living in the state where the Colorado River dies before reaching the ocean, a river exhausted on irrigation and hydropower, would have dared call fresh water entering the ocean "wasted" just a few years ago. But 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 reappeared. The prospect of channeling water to help meet California's thirsty desires still seemed distant in the early 1990s, but people took it seriously enough that the governors of Washington, Oregon, and Idaho spoke out boldly against the idea, attempting to squelch the concept before it gelled.

Even if the Northwest proves able to hold off Californians and their increasing energy and water appetites, it faces a myriad of compromises of its own. 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 eleven thousand years. Provided people still live here eleven thousand years from now, it will of necessity continue as a lifeline. And the decisions we make, the compromises we choose—about salmon and wildlife and energy and transportation and the balance between them—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. We need to personalize those future generations, to think of them as *our* children, just as we need to think of the Marmes Rockshelter inhabitants as *our* parents. It is difficult to perceive our responsibility to nature only in abstract terms. But if we look to human life as a continuum, as a chain of hands that links the generations of the distant past with those of the distant future, then we can personalize our responsibility for nature, for ourselves, and for our children. Only then will we be able to say no to short-term greed in favor of long-term society good. Only then can we make the short-term decisions that will enable nature and humans to co-exist along the lower Snake far into the future.[22]

The Timbavati Nature Reserve in South Africa has adopted the following motto: "The wildlife of today is not ours to dispose of as we please. We have it in trust. We must account for it to those who come after." So it is with the salmon of the Snake and the river they swim in: we manage it in trust for future generations. We might not today appreciate all that Herbert West and an earlier generation of politicians, developers, and Engineers wrought, but we should recognize their skill, tenaciousness, and audacity. And while they did alter the river beyond what many of us might today prefer, they did not destroy it as a living organism. They left us enough of nature to appreciate and enough of engineering technology to dazzle. It is now our responsibility to muster their strength, their innovative spirit, their can-do attitude, to ensure that we pass on a worthy legacy. For our decisions will, in the final analysis, determine whether this stream of compromise will ultimately be branded a river of life or a channel of death. And those decisions can no longer be made in the abstract. Each of us will need to struggle with the issues of fish and power and checkbooks and jobs. The easy choices on the lower Snake have all been made.[23]

Endnotes

Endnote Abbreviations

Andrus Papers: Papers of Idaho Governor Cecil Andrus, Idaho State Historical Society, Boise

Brock Evans Papers: Papers of the Sierra Club's Brock Evans, University of Washington Library, Seattle

BSU: Boise State University Library

CBIAC: Papers of the Columbia Basin Interagency Committee, University of Washington Library, Seattle

Church Papers: Papers of Idaho Senator Frank Church, Boise State University Library

EDF: Engineering Division Files

EWSHS: Eastern Washington State Historical Society, Spokane

EWU: Eastern Washington University Library, Manuscripts and Archives Section, Cheney

IDFG: Idaho Department of Fish and Game Library, Boise

IEWA: Papers of the Inland Empire Waterways Association, Whitman College Library, Walla Walla

ISHS: Idaho State Historical Society, Boise

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

Magnuson Papers: Papers of Washington Senator Warren G. Magnuson, University of Washington Library, Seattle.