Dam Breaching in the Pacific Northwest: Lessons for the Nation

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Dam Removal in the Pacific Northwest: Lessons for the Nation

by Michael C. Blumm* and Andrew B. Erickson**

Over the past dozen years, a number of large dams in the Pacific Northwest have been removed in an effort to restore riverine ecosystems and dependent species like salmon. These dam removals provide perhaps the best example of large-scale environmental remediation in the 21st century. This restoration, however, has occurred on a case-by-case basis, without a comprehensive plan. Yet the result has been to put into motion ongoing rehabilitation efforts in four distinct river basins: the Elwah and White Salmon in Washington and the Sandy and Rogue in Oregon. In all, nine significant dams have been removed, and four more—in the contentious Klamath Basin of Oregon and California—are slated for removal in within the next decade. This article surveys both the successful and proposed removals in to draw lessons both within and beyond the Pacific Northwest. We identify a number of factors that determine both the speed and success of dam removal efforts, including the availability of the federal licensing process under the Federal Power Act, the existence and organization of local opposition, the amount and sources of funding, and the support of federal and state resource agencies and well-positioned members of Congress. These factors suggest that the promised removal of the Klamath Dams as well as calls for removing the federal dams on the Lower Snake face significant odds.

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I. Introduction

The Pacific Northwest stands at the forefront of a new era in dam removal and river restoration. For over twenty years, the government has studied and river advocates have championed a policy of breaching dams blocking salmon passages to spawning streams in Washington, Oregon, and California.\(^1\) Recently removed dams and

several scheduled removals indicate that long-fought efforts to remove certain dams and restore their rivers are bearing fruit.²

For most of the twentieth century, dam construction dominated the rivers of the Pacific Northwest.³ Throughout the region’s major river basins, dams produced hydropower, irrigation, flood control, and opportunities for recreation.⁴ Yet the benefits of the dams came at high environmental costs.⁵ Salmon and other anadromous fish that return from the ocean to spawn in freshwater streams encounter dams that often prevent their passage.⁶ The high mortality rates caused by dams led to the listing of a number of species of salmon under the Endangered Species Act (ESA).⁷ The inadequacy of fish ladders, changed hydraulic conditions, and the difficulties of downstream fish

⁶F. Lorraine Bodi, Protecting Columbia River Salmon Under the Endangered Species Act, 10 ENVTL. L. 349, 369 (1980). The fish blocked include not only salmon, but also steelhead, which are technically trout, but which share anadromous characteristics with salmon. See Michael C. Blumm et al., Practiced at the Art of Deception: The Failure of Columbia River Salmon Recovery Under the Endangered Species Act, 36 ENVTL. L. 709, 711 (2006).
passage around the dams led many to claim that saving and replenishing salmon resources depended on removing barriers to free-flowing rivers and restoring the rivers’ natural hydrology.8

Serious public attention turned to the prospect of removing dams in the 1990s.9 In 1992, Congress authorized the federal purchase of the Elwha and Glines Canyon Dams in Washington state for $29.5 million.10 The Elwha Act directed the Department of the Interior to study and implement complete restoration of the Elwha River ecosystem, including the removal of the two dams.11 Two years later, in 1994, the Federal Energy Regulatory Commission (FERC) issued a policy statement interpreting the Electric Consumers Protection Act12—which requires FERC to give equal consideration to environmental and economic factors when licensing dams13—concluding that the agency could order removal of dams at the dam owner’s expense.14 Inherent in FERC’s dam removal policy was the recognition that in some cases the balance of environmental and economic considerations tipped in favor of removing dams.15 FERC

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8See Rollie Wilson, Removing Dam Development to Recover Columbia Basin Treaty Protected Salmon Economies, 24 AM. INDIAN L. REV. 357 (2000); STEVEN HAWLEY, RECOVERING A LOST RIVER: REMOVING DAMS, REWILDING SALMON, REVITALIZING COMMUNITIES (2011); Blumm et al., supra note 5, at 1006.
9See Pyle, supra note 1, at 98–99.
11 Id.
14Id. at 340.
15See Peter J. Carney, Dam Removal: Evolving Federal Policy Opens a New Avenue of Fisheries and Ecosystem Management, 5 OCEAN & COASTAL L.J. 309, 316 (2000); Blumm et al., supra note 5, at 1052 (concluding that
used this power for the first time in 1997 when it ordered the removal of the Edwards Dam in Maine. Consequently, in 1999, for the first time in 160 years, the Kennebec River flowed unimpeded to the ocean, allowing the free passage of fish from the Atlantic to spawn upstream in headwaters tributaries.

The success of the Edwards Dam removal led to increased interest in dam removal and an accelerating number of proposals for river restoration in the Pacific Northwest. But removing dams and restoring rivers is quite complex. Aside from the physical practicalities of engineering safe dam breaches and restoring ecosystems, legal and political factors affect the speed and success of removal efforts. Some dam removal projects have proceeded relatively quickly from proposal to completion. Other projects experience conflict, political wrangling, and serious delay. This paper

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the economic benefits of dam removal sometimes outweigh the economic benefits of leaving dams in place).

16 See Carney, supra note 15, at 325.

17 Id. at 324.

18 In 2009, old dams were being removed at rate of 40 per year. See Matthew Preusch, Explorer; Dams go Down, Uncorking Rivers for Kayakers, THE NEW YORK TIMES, Aug. 9, 2009; Scott Learn, Hydropower Dam Removal Ramps Up In the Northwest This Fall, THE OREGONIAN, Jul. 25, 2011.


21 See David H. Becker, The Challenges of Dam Removal: The History and Lessons of the Condit Dam and Potential Threats from the 2005 Federal Power Act Amendments, 36 ENVT. L. 811, n. 135 (2006). The Gold Hill and Gold Ray dams were removed within a few years of the initial proposal. See infra Part V. Portland General Electric removed the Little Sandy and Marmot Dams near Mt. Hood eight and nine years after the initial proposal. See infra Part IV.

examines the factors that affect the outcome of dam removal proposals, including the size of the removal, the FERC relicensing process, local opposition, political support, and funding.

We examine several dam removals and proposed removals in the Pacific Northwest in order to analyze the factors that contribute to successful and speedy dam removal. Section II begins by investigating the Elwha and Glines Canyon Dams on the Elwha River near Olympic National Park in western Washington. The federal government purchased both dams in 2000 and began the removal process in the fall of 2011.\textsuperscript{23} The government aims to restore the natural ecosystem near the national park over the next thirty years.\textsuperscript{24}

Section III addresses the removal of the Condit Dam on the White Salmon River in southern Washington. The Condit removal was a result of a 1999 settlement among the Yakama Nation and other tribes, the owner-operator, PacifiCorp, and federal government agencies over salmon access to traditional fishing areas upstream.\textsuperscript{25} PacifiCorp faced the choice of implementing expensive modifications to allow fish passage at the Condit, or agree to pay for a complete removal. After a dozen years,

\begin{footnotes}
\item[24] See infra Part II.
\item[25] See infra Part III.
\end{footnotes}
PacifiCorp removed the dam in October 2011, with remediation activities, including the removal of the dam remnants, scheduled for 2012.26

Section IV turns to the removals of the Marmot and Sandy Dams near Mt. Hood outside of Portland, Oregon. These two small-scale, hydroelectric dams—owned and operated by Portland General Electric (PGE)—required extensive repairs and upgrades in order to modernize fish passage facilities and comply with fish passage prescriptions under the Federal Power Act.27 PGE opted for removal rather than pay for the expensive repairs, and the dams were removed without much fanfare in 2007 and 2008, respectively.28

Section V examines the Rogue River watershed in southern Oregon. The Rogue Basin once featured eight major dams that provided irrigation water and flood control. But between 2008 and 2010, local governments removed three of the dams: the Gold Hill, Savage Rapids, and Gold Ray Dams; and the Army Corps of Engineers notched a fourth, the Elk Creek Dam.29 At the time of removal, none of the dams provided hydroelectric power, and the extensive maintenance costs contributed to the various decisions to remove the aging dams and not complete the Elk Creek Dam.30

28See infra Part IV.
29See infra Part V.
30See Preusch, supra note 2, at 1.
Section VI proceeds to consider proposals for dam removal in the Klamath River Basin in southern Oregon and northern California. The Klamath Basin now has seven major dams, all owned by PacifiCorp, all but one of which provide significant sources of hydroelectric power. In 2010, two major settlements in the Klamath Basin established a goal of removing four of these dams on the mainstem of the Klamath River by 2020. The Klamath restoration would be the largest dam removal project in history, but resolving the contentious issues of funding for removal and allocating water rights remain significant hurdles before beginning the Klamath River restoration.

The article concludes by assessing the prospects for future dam removals and investigating how lessons from the Pacific Northwest can be applied to other regions. The experiences of dam removal in the Pacific Northwest, including restoration projects as monumental as the dams they will replace, provide useful examples for other regions struggling to break down the complex legal, political, and concrete barriers to restoring free-flowing rivers.

II. The Elwha River: Removal of the Elwha and Glines Canyon Dams

The Elwha River’s headwaters are in the Bailey Range of the Olympic Mountains in western Washington. The river flows north to the Strait of Juan de Fuca, halfway

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32 See infra Part VI.
between the Pacific Ocean and Puget Sound. Glaciers that once covered the Olympic Peninsula during the Pleistocene shaped the hydrology of the Elwha watershed, creating a rapid river that descends 4,500 feet in just forty-five miles. Before construction of the dams, the Elwha River supported a highly productive fishery, regarded as one of the most prolific in the Pacific Northwest. The Elwha watershed provided spawning habitat for every species of anadromous fish endemic to the Pacific Northwest, including the massive Elwha River chinook salmon that often weighed more than a hundred pounds. For over 2,700 years, the Elwha River’s fisheries helped sustain the survival and livelihoods of the native inhabitants of the area.

A. Damming the Elwha River

The growth of non-native settlement on the Olympic Peninsula near the end of the nineteenth century led to drastic changes in the human economy of the region as

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36 Spring- and summer-fall run chinook (Oncorhynchus tshawytscha), coho (O. kisutch), chum (O. keta), pink (O. gorbuscha), and sockeye salmon (O. nerka); summer- and winter-run steelhead (O. mykiss), sea-run cutthroat trout (O. clarki), sea-run native char (Dolly Varden (Salvelinus malma), and bull trout (S. confluentus). See id. at 13.
38 The Elwha River’s human history begins with the first inhabitants, the Lower Elwha Klallam Tribe. See LYNDA V. MAPES, BREAKING GROUND: THE LOWER EL WHA KLALLAM TRIBE AND THE UNEARTHING OF TSE-WHIT-ZEN VILLAGE 30 (2009).
well the Elwha River ecosystem. Since 1914, the Elwha and Glines Canyon Dams produced hydroelectric power that facilitated the growth in cities and industries throughout the peninsula. Yet almost immediately after the dams’ construction, the river’s salmon fishery virtually disappeared, and the ecology of the Elwha River entered a steep and long-term decline.

1. Construction of the Elwha and Glines Canyon Dams

In 1910, the Olympic Power and Development Company began construction of a hydroelectric dam in the Elwha Gorge, five miles upstream from the river’s mouth. Engineers built an eighty-foot concrete gravity dam across the river by anchoring each side of the dam to the canyon walls, suspending the retaining wall down to the riverbed. After the first design failed and flooded downstream communities, the reconstructed Elwha Dam was completed in 1914, standing 105 feet tall and creating a 270-acre reservoir, Lake Aldwell.

The success of lumber mills and the growing economy of the peninsula led to increased demand for electricity and more hydroelectric development. In 1925, construction of a second dam began about eight miles upstream from the Elwha in

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39 Brown, supra note 37, at 69.
42 See NPS Dam Construction, supra note 40.
Glines Canyon. Workers completed Glines Canyon Dam, a 210-foot concrete arch dam in 1927, which created a new reservoir on the Elwha River: Lake Mills. Hydroelectric power generated at the Glines Canyon Dam and a significant water diversion, totaling more than 125 cubic feet per second from the Elwha River, supplied lumber mills in Port Angeles, Washington. Unlike the Elwha Dam, which was constructed before enactment of the 1920 Federal Power Act, the Glines Canyon Dam received a fifty-year permit from the Federal Power Commission for the production of hydropower in 1926.

Together, the Elwha and Glines Canyon Dams generated a significant amount of electricity for the Olympic Peninsula. The dams produced over twenty-eight megawatts (MW) and supplied power to lumber mills in Port Angeles and cities up to sixty miles away. Over their one hundred-year history, the dams changed ownership multiple times, reflecting their profitability and their importance as reliable sources of electricity to the industries in the region.

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43 See ELIZABETH GROSSMAN, WATERSHED: THE UNDAMMING OF AMERICA 159 (2002). The Elwha Dam was built at river mile 4.9 and the Glines Canyon Dam at river mile 13.5. Id. at 158–59.
44 See U.S. Bureau of Reclamation, supra note 33; Grossman, supra note 43, at 159.
45 See Brown, supra note 37, at 94.
47 See Brown, supra note 37, at 94.
49 See Brown, supra note 37 at 72.
Although the construction and operation of the dams garnered widespread public support, concerns about the effects on the Elwha’s salmon fishery arose in the first years of construction. The Elwha and Glines Canyon Dams were both built without fish passage facilities, in violation of Washington state law, and early attempts at restocking the river with hatchery fish failed. Since the closure of the original fish hatchery in 1922, the Elwha River’s dams have operated without fish ladders, other fish passage devices, or even a hatchery. Not until 1975 did the dam owners enter into a mitigation agreement with the Washington Department of Fish and Wildlife to fund a salmon rearing channel downstream from the Elwha Dam and to regulate river flows to facilitate salmon spawning in the lower river.

2. The Decline of the Elwha River Ecosystem

The Elwha and Glines Canyon Dams completely blocked fish passage to crucial spawning habitat in the upper forty miles of the Elwha River and significantly altered

50See id. at 66.
511889–90 Wash. Sess. Laws 107, § 8 (requiring fish passage facilities whenever an obstruction was placed in a river “wherever fish food are wont to ascend”); see Brown, supra note 37, at 71; Busch, supra note 33, at 12.
52See Brown, supra note 37, at 72.
the glacial-fed river’s hydromorphology.\textsuperscript{55} Almost immediately after the completion of the Elwha Dam, the river’s salmon population dropped by seventy-five percent.\textsuperscript{56} None of the nine species of anadromous fish that spawned in the upstream portions of the river and its headwaters managed to spawn in years after 1910,\textsuperscript{57} and all but one species of salmon—the fall chinook—were virtually eliminated from the Elwha ecosystem.\textsuperscript{58} Even populations of fall chinook, which spawned in the lower stretches of the river below the dams, were significantly reduced due to changing river habitat.\textsuperscript{59}

Although the Elwha and Glines Canyon Dams wreaked havoc on the downstream ecosystem, the upper reaches of the Elwha River remained in near-pristine condition.\textsuperscript{60} In 1938, Congress created Olympic National Park, preserving nearly forty miles of the Elwha River, including Lake Mills up to the foundation of the Glines Canyon Dam.\textsuperscript{61} After 1938, the Glines Canyon Dam continued to operate on the border of the national park in a special use zone, allowing the dam to generate electricity despite the park’s preservation goals.\textsuperscript{62}

\textsuperscript{56} See Brown, supra note 37, at 72.
\textsuperscript{57} See id. at 66.
\textsuperscript{58} See id.; Wunderluch et al., supra note 35, at 13.
\textsuperscript{59} NATIONAL PARK SERVICE, FINAL ENVIRONMENTAL IMPACT STATEMENT, ELWHA RIVER ECOSYSTEM RESTORATION IMPLEMENTATION 18 (1996).
\textsuperscript{62} The Glines Canyon Dam is located on a private property inholding within the boundaries of the park. See Charles Gowan et al., The Role of Ecosystem Valuation in Environmental Decision Making: Hydropower
B. FERC Relicensing, Political Compromise, and Dam Removal Efforts

The loss of wild anadromous fish and the adverse ecological effects on the Elwha River led to sustained efforts aimed at removing the dams and restoring the river’s ecosystem. In 1937, the first proposal to require dam removal and river restoration on the Elwha River failed in the Washington state legislature.63 Fifty years later, a challenge to the relicensing of the Glines Canyon Dam evolved into a broad political effort to force the removal of the dams.64 Nearly a century after construction of the Elwha Dam, the removal of the dams is ongoing as of this writing; wild salmon are expected to return to the headwaters within a few years.65

1. Relicensing the Dams

The ultimately successful campaign to remove the dams began in the 1970s as a challenge to the relicensing of the Glines Canyon Dam.66 In 1973, the dam owners, whose fifty-year license would expire in 1976,67 submitted an application to FERC to relicense the dam.68 The application created a controversy over whether FERC

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63 State Representative Francis Perkins introduced legislation in 1937 that would have required dam removal and restoration of the Elwha River. The legislation failed after the Washington Director of Fisheries declined to support the proposal. See Brown, supra note 37, at 94.
64 See Bender, supra note 22, at 223–29.
66 See Bender, supra note 22, at 223.
68 At the time of the relicensing application, the James River Corporation owned both the Elwha and Glines Canyon Dams. The previous owner, Crown Zellerbach, Corporation, became the James River Corporation. Crown Zellerbach owned the Elwha Dam since 1919 and built the Glines Canyon Dam in
possessed the authority to license the dam, now located on the border of Olympic National Park. Opponents claimed that the relicensing conflicted with the park’s preservation goals, especially because the reservoir, Lake Mills, flooded portions of the park. Without a FERC license to operate, opponents claimed that the dam would have to be removed.

In 1978, the Elwha Dam failed a federal safety inspection, causing alarm for downstream landowners and sparking increased interest in dam removal. Out of concern for its reservation property downstream and the loss of traditional fisheries, the Lower Elwha Klallam Tribe became the first major advocate for complete dam removal and restoration. In 1986, the tribe intervened in the licensing proceedings before FERC, requesting denial of the application and removal of the dams. Since 1986, environmental organizations, the U.S. Fish and Wildlife Service (FWS), and the

1926. See Brown, supra note 37, at 66, 94; NPS, FINAL ENVIRONMENTAL IMPACT STATEMENT, supra note 61 at 15.
69 See Bender, supra note 22, at 224–25.
71 See Busch, supra note 33, at 17–18.
72 See id.; Brown, supra note 37, at 107.
74 See Gowan et al., supra note 62, at 512.
National Marine Fisheries Service (NMFS), and the National Park Service (NPS) joined the tribe in opposition to the dams’ relicensing.\textsuperscript{76}

In response to this opposition, FERC took the position that it possessed the authority under the Federal Power Act to relicense the Glines Canyon Dam.\textsuperscript{77} Although Lake Mills was located within Olympic National Park, the dam and the land underneath the dam were private land;\textsuperscript{78} therefore, FERC claimed it could grant the license to generate hydropower.\textsuperscript{79} In a 1990 decision, FERC concluded that the agency had jurisdiction to relicense the dams and dismissed the intervenors’ claims.\textsuperscript{80} Environmental organizations, the tribe, the FWS, and NMFS appealed FERC’s jurisdictional ruling to the Ninth Circuit.\textsuperscript{81}

While litigation over FERC jurisdiction was working its way through the courts, support grew for the efforts to remove the dams.\textsuperscript{82} Politicians from Washington state and across the country began to take notice of the controversy.\textsuperscript{83} In a move that signaled his support for dam removal, Representative John Dingell of Michigan requested a General Accounting Office (GAO) study of whether FERC had jurisdiction to relicense

\textsuperscript{76}See Busch, supra note 33, at 17.
\textsuperscript{78}Id. at ¶ 61,268.
\textsuperscript{79}Id. at ¶ 61,271.
\textsuperscript{80}Id.
\textsuperscript{82}See Bender, supra note 22, at 225–26.
\textsuperscript{83}See WILLIAM R. LOWRY, DAM POLITICS: RESTORING AMERICA’S RIVERS 141 (2003).
the dams. The GAO, now the Government Accountability Office, concluded that FERC lacked jurisdiction to license a hydroelectric dam located within the borders of a national park. See JEFF CRANE, FINDING THE RIVER: AN ENVIRONMENTAL HISTORY OF THE ELWHA 147 (2011).

The feasibility of dam removal, combined with the potential for a lengthy legal quagmire over the question of federal jurisdiction, eventually led to a compromise between the environmental interests advocating for dam removal, and the dam owners and electricity customers arguing for relicensing.

2. Political Compromise and Funding for Removal

The political compromise that resulted in the federal purchase and removal of the Elwha and Glines Canyon Dams was a product of Congressman Dingell and multiple stakeholders’ efforts to end the legal stalemate over FERC jurisdiction. Key stakeholders in the process were the advocates for dam removal and restoration, including environmental organizations, the tribe, FWS, NMFS, and the NPS. Dam removal advocates hoped for the complete removal of the dams in order to restore the degraded Elwha River, producing a naturally flowing river with native fish populations.

The community of the Elwha region, including the city of Port Angeles, Washington, ended up in the middle of the political fight. Testimony before the U.S. Office of Hydropower Licensing, supra note 1.

See Busch, supra note 33, at 18.

Id.

Id.
Senate Committee on Energy and Natural Resources revealed the community’s fears that major changes in the area that would affect its economic stability, the city’s water supply, and its general way of life.\textsuperscript{89} In response to political negotiations over the future of the dams, Port Angeles formed the Elwha Citizens Advisory Committee, which eventually reached a consensus in support of dam removal.\textsuperscript{90}

On the other side of the controversy, the dam owners, James River Corporation, and power consumers, like Daishowa American Paper Mill opposed dam removal.\textsuperscript{91} In the early 1990s, Daishowa American operated the largest mill in Port Angeles,\textsuperscript{92} relying on hydroelectric power from the Elwha dams to supply between thirty-four and forty-two percent of the mill’s electricity.\textsuperscript{93} The mill received favorable rates from the dams and opposed dam removal, which would jeopardize the mill’s economic viability.\textsuperscript{94}

In 1992, advocates for dam removal reached a compromise with the James River Corporation and Daishowa mill.\textsuperscript{95} Both sides foresaw a lengthy and costly legal battle over the future of dam relicensing and agreed to a congressional compromise that

\textsuperscript{89} Hearing on S. 2527, June 4, 1992, p. 120 (testimony from J.D. Hallett, Mayor of Port Angeles, Washington).
\textsuperscript{90} The advisory committee determined that the benefits of restoring salmon populations outweighed other concerns, such as property values and removal costs. See Harry Lydiard, A Remarkable Grassroots Effort: The Work of the Elwha Citizens’ Advisory Committee, Olympic Park Associates Newsletter, Jun. 1996, (available at www.drizzle.com/~rdpayne/opa-news-v4n1.html).
\textsuperscript{91} See Bender, supra note 22, at 226.
\textsuperscript{92} See Brown, supra note 37, at 72.
\textsuperscript{93} Hearing on S. 2527, supra note 91, at 117.
\textsuperscript{94} See Gowan et al., supra note 64, at 510 (Daishowa American Corp. purchased electricity from the Elwha dams at less than half the rates charged by competitor electricity providers).
\textsuperscript{95} See Bender, supra note 22, at 227.
promised favorable terms to both sides. The ensuing 1992 Elwha River Ecosystem and Fisheries Restoration Act authorized the Department of the Interior to purchase the Elwha and Glines Canyon Dams, directed Interior to study the feasibility for removal and complete restoration of the ecosystem, and provided a guarantee that the customers of Elwha hydroelectricity would receive power from other electricity providers at fair market rates. The Elwha Act thus ended the conflict of FERC jurisdiction over relicensing by granting permission for the dams to operate temporarily until the federal government appropriated funds for the dams’ purchase.

Although the Elwha Act settled the conflict over the future of the dams, the appropriation of federal funds for the purchase and deconstruction of the dams created new political controversy. The Elwha Act authorized the Department of the Interior to purchase and remove the dams but left the appropriation of funds to future acts of Congress. Initially, the Elwha Act received broad political support, from both Democrats and Republicans. But in the years following the 1994 congressional

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96 See Busch, supra note 33, at 18.
98 Id. at § 3(c); id. at § 4.
99 Id. at § 5(b).
101 See Busch, supra note 33, at 20.
103 See Lowry, supra note 83, at 146;
elections, the political atmosphere changed. An original supporter of the Elwha Act, Senator Slade Gorton (R-WA) withdrew his support for appropriations and later conditioned federal funding for the removal of the Elwha dams on guarantees that the federal government would not breach dams on the Snake River. Senator Gorton proceeded to prevent passage of numerous appropriations bills in the Senate from 1992 to 2000, but in 2000 he eventually lost a reelection bid to Democrat, Maria Cantwell. In 1998, Congress appropriated $29.5 million for the Department of the Interior to buy both dams.

Appropriations for the deconstruction of the dams occurred in stages over the decade from 2000 to 2010. Champions of dam removal in Congress, including Representative Norman Dicks of northwest Washington, secured about $20 million per year in funding for the dams’ removal. By 2004, funding for the Elwha restoration totaled $126.7 million, roughly half of the initial estimated removal cost of $246 to $272

105See Lowry, supra note 83, at 146–47; Bender, supra note 22, at 228.
108See Kim Todd, Rebuilding a River as Washington’s Elwha Dams Come Down, HIGH COUNTRY NEWS, Sept. 19, 2011. Former Senator Bill Bradley stressed that the effort to remove the Elwha Dams resulted from a truly bi-partisan effort in Congress, and was supported by Democrats and Republicans in Washington, D.C., and Washington state. See Sen. Bill Bradley, Former U.S. Senator from New Jersey, Keynote Address at Dinner Hosted by the Lower Elwha Klallam Tribe (Sept. 16, 2011) (on file with authors).
million. Stimulus funding from the 2009 American Reinvestment and Recovery Act contributed an additional $54 million. In April 2010, the NPS, which operated as the lead agency in managing the Elwha dam removals and restoration, issued a solicitation for bids to conduct the removal of both dams, indicating that the total appropriation for complete removal and restoration was in hand.

3. The Removal

The three-year process of removing the dams began during the summer of 2011. The first step involved the drawdown of both reservoirs, Lake Mills and Lake Aldwell. On September 15, 2011, engineers began the removal of the Glines Canyon Dam by “notching” a top section of the dam and allowing the reservoir to drain out of the notched area. The 173-foot dam will be notched in sections, creating temporary spillways and draining the reservoir until the entire concrete structure is removed. On September 21, 2011, the removal of the Elwha Dam began with the creation of a diversion around the dam. Engineers created cofferdams to channel water into the

110 NPS, FINAL ENVIRONMENTAL IMPACT STATEMENT, supra note 61, at 96. Revisions to this early estimate placed the costs at about $325 million. Todd, supra note 108.
114 Id.
116 See NPS, Dam Removal Strategies, supra note 113.
diversion so that the concrete structure could be removed in pieces. When both dams are completely removed in 2014, the stream channel will be restored to resemble pre-dam conditions.

C. Ecological Implications of Removal

The removal of two one hundred-year-old dams presented serious concerns about its positive and negative ecological effects to the Elwha ecosystem. During the dam removal, the NPS will attempt to minimize the short-term environmental effects by removing both dams slowly in sections. Project planners ruled out blasting the dams because of the potential for damage caused by the immediate release of 24 million cubic yards of sediment trapped behind the dams. The NPS concluded that a slow removal, using natural hydrologic erosion to rebuild the river channel was the best option for restoration.


118See NPS, Dam Removal Strategies, supra note 115. As of March 2012, engineers opened the upper stretches of the Elwha River to salmon for the first time in almost a century. Excavators removed enough of the Glines Canyon Dam to allow the river to flow through the remaining structure. Observers hope to see chinook salmon returning to the upper reaches within months. E-mail from Thomas C. Jensen, Partner, SNR Denton, to Michael C. Blumm (Mar. 17, 2012, 21:46 PDT) (on file with authors).

119See NPS, FINAL ENVIRONMENTAL IMPACT STATEMENT, supra note 61; NPS, Dam Removal Strategies, supra note 115.

120See NPS, Dam Removal Strategies, supra note 113.


122See Banse, supra note 121; Brian Clark Howard, Bulldozers Tear Into Big Washington Dams, NATIONAL GEOGRAPHIC, Sept. 23, 2011.
After three years of dam deconstruction and engineering new channels on the footprints of the dams, scientists estimate that it will take about thirty years for the Elwha River to return to its normal flows and sediment loads. In the long-term, the dam removals are predicted to have positive effects on the hydromorphology, biology, and overall ecology of the Elwha ecosystem. Ecologists expect anadromous fish to return to spawn in upstream segments of the Elwha sometime in the next three years, marking the first time in over one hundred years that wild salmon will spawn in the upper Elwha.

III. The White Salmon River: Breaching the Condit Dam

The White Salmon River flows south from glacial headwaters on the slopes of Mount Adams in south-central Washington to its confluence with the Columbia River on the Washington-Oregon border. The forty-five-mile-long river cuts through canyons and confined valleys formed of basalt from historic volcanic eruptions and

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123 See NPS, Dam Removal Strategies, supra note 113; Howard, supra note 122.
124 See Ellen K. Mussman et al., Predicting Secondary Reservoir Sediment Erosion and Stabilization Following Dam Removal, 82 NORTHWEST SCIENCE 236, 244 (2008) (concluding large amounts of erosion will occur to restore the natural channel geomorphology).
127 See Mapes, supra note 65, at 1. The Lower Elwha Klallam Tribe has voluntarily agreed to not fish the river for five years following dam removal in order to promote the recovery and reestablishment of fish populations. See Nathan Rice, Fish Fight on the Elwha, HIGH COUNTRY NEWS, Oct. 3, 2011; Lynda V. Mapes, Elwha River Hatchery to Hurt Recovery, Critics Say, THE SEATTLE TIMES, Aug. 25, 2011.
carries high sediment loads resulting from the erosion of deposits left by lahars, which were common throughout the White Salmon watershed. Anadromous fish, including chinook, coho, chum, steelhead, and sea-run cutthroat trout were once common in the lower reaches of the river and tributaries, which provided pristine spawning habitat and cold-water refuges for fish migrating up the Columbia River. Husum Falls, a fifteen-foot waterfall located sixteen miles upstream from the confluence with the Columbia formed a natural barrier for migrating fish. Until the construction of the Condit Dam near the mouth of the White Salmon blocked all but the lower three miles for anadromous fish passage, the area’s first inhabitants, the Yakima Tribe, carried out a centuries-old tradition of fishing and sustaining themselves on salmon caught near Husum Falls.

A. Condit Dam Construction

Population growth in the Columbia River Gorge at the beginning of the 1900s led to an increased demand for electricity to power the region’s chief economic activity,

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paper mills.\footnote{See Charlton H. Bonham, The Condit Dam Removal and Section 18 of the Federal Power Act: A Coerced Settlement, 14 J. ENVTL. L. & LITIG. 97, 104 (1999).} In 1911, the Crown Columbia Paper Mill of Camas, Washington, one of the largest paper mills on the Pacific Coast, formed the Northwestern Electric Company in order to build a hydroelectric power facility to supply energy to the mill.\footnote{See id. at 23–25.} The White Salmon’s exposed rock canyon walls, steep gradient, and high potential energy provided an ideal placement for a hydroelectric project.\footnote{See id. at 31–32.} In 1912, engineers completely diverted the river around the dam site 3.3 miles upstream from the river’s mouth and used 30,000 cubic yards of concrete to construct the solid-concrete gravity dam.\footnote{See id. at 9, 40.} The completed Condit Dam stood 125 feet tall, spanned 471 feet wide, and formed Northwestern Lake, a 2.3-mile long, ninety-seven-acre reservoir.\footnote{See id. at 9, 40.}

The Condit Dam’s power plant produced about fifteen megawatts of electricity, a significant source of power in the early 1900s.\footnote{See Becker, supra note 21, at 818; PacifiCorp, supra note 135, at 19.} The Crown Columbia paper mill used only twenty percent of the electricity, so Northwestern Electric marketed the remaining eighty percent throughout the Columbia River Gorge, including to the cities of Portland, Oregon and Vancouver, Washington.\footnote{See PacifiCorp, supra note 135, at 17.} Completion of the Condit Dam coincided with a downturn in the area’s economy from 1913 to 1915, which provided Northwestern an advantage in the electricity market because power from the Condit
project could be supplied more cheaply than competitors.\textsuperscript{141} In the first years of power production, Northwestern supplied one-third of the area’s market share and became hugely profitable—eventually merging with the Pacific Power and Light Company in 1947, which became PacifiCorp in 1984.\textsuperscript{142}

The Condit Dam completely blocked fish passage from the lower 3.3 miles of the White Salmon to the upper sections of the river and tributaries.\textsuperscript{143} As part of the original design, the Condit Dam included wooden fish ladders; however, within the first few years after construction spring floods destroyed the wooden ladders, as well as their replacements, which were also not designed to withstand high water.\textsuperscript{144} From 1917 until the dam’s removal in 2011, the Condit Dam provided no fish passage facilities, resulting in a catastrophic decline in the river’s native fish populations.\textsuperscript{145} Prior to dam removal, migrating anadromous fish were no longer present in the upper White Salmon River, and most fish spawning in the lower 3.3 miles were non-wild hatchery fish.\textsuperscript{146} By removing the Condit Dam, biologists estimated that an additional fourteen miles of

\textsuperscript{141}See id. at 19.
\textsuperscript{142}See id. at 18–20.
\textsuperscript{144}See Bonham, supra note 134, at 110; Office of Hydropower Licensing, Federal Energy Regulatory Commission, FERC No. 2342-005, Condit Hydroelectric Project Final Environmental Impact Statement 3-50 to 3-51 (1996) [hereinafter Condit FEIS].
\textsuperscript{145}See Becker, supra note 21, at 818; Bonham, supra note 134, at 110; Condit FEIS, supra note 144, at 3-50.
\textsuperscript{146}See Condit FEIS, supra note 144, at 3-17 to 3-21; Becker, supra note 21, at 818.
salmon spawning habitat and thirty-three miles of steelhead habitat will be accessible in the upper river and tributaries.\textsuperscript{147}

\textbf{B. The Federal Power Act, Relicensing, and Dam Removal Efforts}

Completion of the Condit Dam occurred preceded federal laws regulating the construction and operation of non-federal dams. The Condit Dam received its first twenty-year license in 1968,\textsuperscript{148} after the U.S. Supreme Court interpreted the Federal Power Act of 1935\textsuperscript{149} to reach non-navigable tributaries of navigable waters.\textsuperscript{150} Near the expiration of Condit’s operating license, FERC began the process of relicensing the dam.\textsuperscript{151} In 1996, FERC issued a final environmental impact statement on the license renewal, which required the dam operator, PacifiCorp to construct permanent fish passage facilities, making the continued operation and relicensing of the dam uneconomical.\textsuperscript{152} In 1999, PacifiCorp signed a settlement agreement with the Yakima Tribe and environmental groups, agreeing to withdraw the license renewal request and remove the Condit Dam.\textsuperscript{153} For the next twelve years, a staggering complexity of federal

\begin{footnotesize}
\textsuperscript{147} See Wash. Dep’t of Ecology, Condit Dam Removal, Draft State Environmental Policy Act Supplemental Envtl. Impact Statement 4.3-9 (2005) [hereinafter Washington DSEIS]; Becker, \textit{supra} note 21, at 819. Since 1917, the Yakama Tribe has not been able to exercise their legal right to fish for traditional species of salmon at their usual and accustomed places. See Becker, \textit{supra} note 21, at 820. In addition, the dam blocked recreational opportunities, including the potential for world-class white water kayaking and rafting. \textit{Id.}

\textsuperscript{148} Condit FEIS, \textit{supra} note 144, at 3-57; see Bonham, \textit{supra} note 134, at 99.


\textsuperscript{151} See Becker, \textit{supra} note 21, at 824–25.

\textsuperscript{152} See \textit{id.}, at 826.

\textsuperscript{153} See \textit{id.}, at 826–27.
\end{footnotesize}
and state bureaucracies, permitting requirements, and community opposition delayed the eventual removal of the dam.

1. The Federal Power Act and FERC Re-licensing

   Since 1920, the FPA authorized FERC to license non-federally owned dams operating on the navigable waters of the United States.154 Section 18 of the FPA requires every non-federal dam applying for licensing to provide for the “construction, maintenance, and operation by a licensee at its own expense of such . . . fishways as may be prescribed by” the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS).155 In 1986, Congress amended the FPA to require FERC to condition licenses on the implementation of measures recommended by federal and state wildlife agencies to protect and mitigate potential damages to fish and wildlife.156

   In addition to protecting fish and wildlife, state agencies may also impose water quality

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155 16 U.S.C. § 811 (2006). See Am. Rivers v. Fed. Energy Reg. Comm’n, 201 F.3d 1186, 1207 (9th Cir. 2000) (FERC must include the agency fishway recommendations as part of the dam’s license). In 2005, Congress amended the FPA to provide new procedures through which a dam operator may propose alternatives to the fish and wildlife protections or mitigation measures recommended by the FWS or NMFS. The federal agencies must then make a final determination to accept or reject the proposed alternatives, but the decision must be based on whether the proposal would adequately protect the resource. Energy Policy Act of 2005 § 241(c), 119 Stat. 594, 674-77. This has lead at least one author to conclude that the 2005 Federal Power Act Amendments may make it more time consuming and difficult for agencies to condition licenses on fish protection measures in the future. Becker, * supra* note 21, at 868.

conditions on non-federal dam operators, and FERC must include the state water quality standards in the license.\textsuperscript{157}

The first twenty-five year FERC license granted to the Condit Dam contained few fish requirements, although it did include a condition for maintaining minimal flows downstream from the dam.\textsuperscript{158} In 1982, in anticipation of the expiration of the license, and out of concern for the ESA-listed salmon and steelhead in the Columbia River Basin, the Northwest Power and Conservation Council (NPCC), an interstate compact agency charged by Congress with restoring Columbia Basin salmon runs,\textsuperscript{159} adopted a position that any relicensing of the Condit Dam should include provisions for fish passage.\textsuperscript{160} Soon after this first call for fish passage facilities, the Yakama Indian Nation, the Columbia River Inter-Tribal Fish Commission (CRITFC), and multiple environmental groups began advocating for the removal of the Condit Dam in order to promote salmon recovery or, at least, the installation of adequate fish passage at the dam.\textsuperscript{161} In 1991, PacifiCorp submitted an application for relicensing the Condit Dam, proposing to implement several changes to the license, including increasing the


\textsuperscript{158}See Becker, supra note 21, at 824; Bonham, supra note 134, at 114, n. 107.


\textsuperscript{160}NW. POWER & CONSERVATION COUNCIL, COLUMBIA RIVER BASIN FISH & WILDLIFE PROGRAM 7-11 (1982); see Becker, supra note 21, at 824. The original FERC license expired in 1993.

\textsuperscript{161}See Becker, supra note 21, at 824; Chris Watson, Relicensing the Northwest: A Study of the Condit Hydroelectric Project, Northwest Water Law & Policy Project 8 (1995); Condit FEIS, supra note 144, at 4-59 to 4-60.
operating capacity of the power plant, establishing target flows to benefit fish habitat, and carrying out other projects to facilitate recreation and cultural preservation.\textsuperscript{162}

Amid a charged political atmosphere concerning dam removal, FERC conducted an environmental impact statement (EIS) to study the relicensing of the Condit Dam.\textsuperscript{163} FERC’s final EIS in 1996 included the fishway prescriptions of the FWS and NMFS, which would condition the relicensing of the dam on the installation of upstream and downstream fish passage facilities.\textsuperscript{164} In 1997, PacifiCorp requested that FERC stay a final decision on the relicensing application\textsuperscript{165} because the cost of the required fish passage facilities, $30 million, made relicensing the Condit Dam uneconomical.\textsuperscript{166} Instead of making the improvements and investments necessary to relicense the dam, PacifiCorp decided to pursue the most economically efficient alternative: dam removal.\textsuperscript{167}

2. The 1999 Agreement, Federal and State Regulatory Approval, and License Forfeiture

In 1999, PacifiCorp entered into a settlement agreement with the Yakama Tribe, CRITFC, and several environmental groups, in which the company agreed to remove

\textsuperscript{162} PacifiCorp’s proposals included a total investment of $10 million in improvement and mitigation measures.
\textsuperscript{163} See Becker, supra note 21, at 825; Watson, supra note 161, at 40.
\textsuperscript{164} See Becker, supra note 21, at 826; Condit FEIS, supra note 144, at ix-xii, 2-35 to 2-38. FERC rejected PacifiCorp’s proposal to “trap and haul” fish around the dam, at a cost of about $15 million. Id. at I-71 to I-74.
\textsuperscript{166} See Becker, supra note 21, at 826; Condit FEIS, supra note 144, at I-71.
\textsuperscript{167} See Becker, supra note 21, at 826.
the Condit Dam by the end of 2007.\textsuperscript{168} The agreement capped costs of removal at $17.15 million and allowed PacifiCorp to continue operating the dam until 2006.\textsuperscript{169} The removal plan called for blasting the dam and leaving the sediments in place to minimize removal costs.\textsuperscript{170} PacifiCorp submitted the agreement to FERC in 1999. However, the novel issue of whether FERC should construe the agreement as surrendering the operating license or modifying the application to renew the license occupied the agency for two years.\textsuperscript{171} Finally, in 2002, FERC issued a supplemental EIS approving the removal plan and determining that the agreement would be treated as a license surrender, contingent on PacifiCorp receiving the necessary approvals from other federal and state regulatory agencies.\textsuperscript{172}

The presence of at least five ESA-listed species of fish in the White Salmon ecosystem necessitated consultation with the FWS and NMFS and a determination that the removal plan would not adversely affect the listed species or their critical habitat.\textsuperscript{173} In 2004, the FWS designated critical habitat for bull trout in the river, and concluded in the final biological opinion (BiOp) that dam removal would benefit the species, despite

\textsuperscript{169} Id. at 7; see Becker, \textit{supra} note 21, at 827.
\textsuperscript{170} Condit Settlement, \textit{supra} note 168, at 7; see Becker, \textit{supra} note 21, at 827.
\textsuperscript{171} See Becker, \textit{supra} note 21, at 830–31.
\textsuperscript{172} See \textit{id}.
\textsuperscript{173} Both the FWS and NMFS signed the 1999 settlement agreement. Condit Settlement, \textit{supra} note 168, at 1.
insignificant, short-term harms.\textsuperscript{174} In 2006, NMFS reached the same conclusion with regard to ESA-listed salmon and steelhead.\textsuperscript{175}

In addition to the time waiting for biological studies and federal agency approval, the Condit Dam removal suffered from delay due to state and local regulations.\textsuperscript{176} Almost immediately after PacifiCorp announced that it would seek to remove the Condit Dam, local opposition, particularly from the counties of Klickitat and Skamania, Washington made clear that local regulations and requirements would be used to delay or derail the dam removal proposal.\textsuperscript{177} The counties objected to the dam removal project because of the possible negative affects to the aesthetic views of homeowners along the river, the loss of recreation on Northwestern Lake, and the remediation plan that called for leaving sediments in place.\textsuperscript{178} The counties advised FERC and PacifiCorp that the project would have to satisfy local regulations, including requirements for floodplain, zoning, shoreline, noise, and road permits.\textsuperscript{179} PacifiCorp appealed to FERC for relief from the counties’ attempt to delay the dam removal process.\textsuperscript{180} In 2006, FERC issued an order declaring that the FPA preempted state and

\begin{footnotes}
\textsuperscript{174}See Becker, \textit{supra} note 21, at 840.
\textsuperscript{175}See \textit{id}.\textsuperscript{176}See \textit{id}.\textsuperscript{177}See \textit{id}.\textsuperscript{178}See \textit{id}. at 828; Becky Blanton, \textit{PacifiCorp, State and Federal Agencies Accused of Conspiracy}, THE SIERRA TIMES, Nov. 30, 2001.
\end{footnotes}
local laws, unless FERC chose to include such laws in the license or license surrender order.\textsuperscript{181}

The threat of a lawsuit from the counties prompted the state of Washington, a supporter of dam removal, to decide to conduct its own environmental analysis of the dam removal.\textsuperscript{182} The state’s Department of Ecology issued a state EIS in 2007, which acknowledged that water quality and fish would be negatively affected in the short-term.\textsuperscript{183} The state EIS included mitigation measures for some of the possible short-term effects that would occur due to blasting the dam and releasing massive amounts of water and sediments.\textsuperscript{184}

Before beginning the dam removal, PacifiCorp needed a section 401 certification from the state of Washington to confirm that the project met the state’s water quality standards under the Clean Water Act.\textsuperscript{185} In 2003, Washington amended the state’s water quality standards to include a short-term exemption for remediation projects.\textsuperscript{186} The state concluded that the short-term harms of the dam removal project were outweighed

\textsuperscript{182} See Becker, \textit{supra} note 21, at 839.
\textsuperscript{184} \textit{Id.} at 1-12 to 1-22. Washington continued to supplement the DEIS from 2007 to 2010. A final supplemental EIS was completed in January 2010.
\textsuperscript{185} See Becker, \textit{supra} note 21, at 838–39.
by its long-term benefits, and in 2010, the state issued the required section 401 certification.\(^{187}\)

After receiving the section 401 certification, PacifiCorp received the final permits necessary from the U.S. Army Corps of Engineers, under section 404\(^{188}\) of the Clean Water Act and section 10 of the Rivers and Harbors Act.\(^{189}\) In the spring of 2011, FERC accepted PacifiCorp’s license surrender.\(^{190}\) Twelve years after agreeing to removal, PacifiCorp had satisfied all of the federal and state procedures and received the necessary permits to begin removing the Condit Dam.

3. The Dam Removal Process

On October 26, 2011, the Condit Dam was breached, and the removal of the near-century old structure began.\(^{191}\) Engineers cleared sediment and debris immediately upstream from the dam, and drilled and blasted a thirteen-by-eighteen foot drain tunnel at the base of the dam.\(^{192}\) The final blast sent a rush of water downstream at a rate of over 10,000 cubic feet per second into the lower White Salmon, mobilizing more

\(^{187}\) See Becker, supra note 21, at 848-49.  
than 2.4 million cubic yards of sediments trapped upstream in the reservoir. The reservoir drained through the tunnel in approximately six hours, opening space in the reservoir for engineers to begin remediation activities, including bank stabilization and the excavation and removal of the dam structure. The removal of the dam structure and original cofferdam continues as of this writing.

C. Restoring the White Salmon River

Ecologists expect the negative short-term affects of the dam removal, including increased turbidity and downstream fish kills, to be outweighed by the long-term benefits within six to twelve months after removal. In order to mitigate potential short-term adverse affects, biologists trapped 500 chinook salmon from the lower Columbia and White Salmon Rivers and transported the fish upstream. After blasting the dam and releasing sediments from the reservoir, fishery biologists expect the increased salmon and steelhead habitat to benefit the fish populations and the entire ecosystem.

IV. The Sandy River Basin: Decommissioning the Bull Run Hydroelectric Project

The Sandy River drains the northwest slopes of Mt. Hood in western Oregon, flowing from glacial headwaters over volcanic ash and rock deposits for fifty-miles to

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193 Id.
194 Id.
195 See Washington DSEIS, supra note 147, at 4.3-9; Becker, supra note 21, at 866.
196 See CAPTURE AND TRANSPORT OF LOWER COLUMBIA RIVER FALL CHINOOK SALMON PLAN, CONDIT HYDROELECTRIC PROJECT DECOMMISSIONING (FERC PROJECT NO. 2342), (Mar. 15, 2011).
197 Becker, supra note 21, at 820.
the Columbia River. The river and its tributaries receive water from high volumes of rain and snow precipitation in the Cascade Range, glacial melts, and groundwater recharge. Large amounts of fine suspended sediment, glacial silt, caused by the slow, grinding glacial erosion of underlying rocks, and sand deposits found throughout the basin contributed to the river’s nomenclature. The riverbed sand deposits created ideal spawning habitat for the abundant populations of migrating salmon and steelhead that traveled upstream from the Columbia River to the Sandy River’s headwaters.

Historically, the first inhabitants of the area, tribes from villages along the Columbia and Clackamas Rivers, used trails following the Sandy River to upland hunting and gathering grounds, and they fished the abundant salmon runs in the river and its tributaries.

A. The Little Sandy and Marmot Dams

In the late 1800s, population and industrial growth in Portland, Oregon, produced interest in using nearby rivers for water supplies and hydroelectricity. Developers soon invested in small dams and diversions to bring water from the Bull Run River, a tributary of the Sandy River, to Portland, thirty miles west of the Bull Run

199 See id. at 8.
200 See id. at 10.
201 See id. at 5.
203 See Taylor, supra note 198, at 15.
and Sandy confluence. In 1906, the Mt. Hood Railway and Power Company constructed a powerhouse along the Bull Run River and a small diversion dam on the Little Sandy River, a tributary of the Bull Run. The Little Sandy Dam stood sixteen feet high and completely blocked the flow of the Little Sandy River 1.7 miles upstream from its confluence with the Bull Run. The dam channeled the Little Sandy River into a wood box flume diversion, which carried the water more than three miles to Roslyn Lake where the company stored the water for releases to generate electricity at the Bull Run powerhouse. The completion of the Little Sandy Dam in 1912 completely blocked salmon passage to upstream sections of the Little Sandy River and drastically reduced downstream flows.

The success of the Little Sandy Dam and Bull Run powerhouse led to an increased demand for water supplies to bolster hydroelectric output from the project. In 1913, the Mt. Hood Company constructed the Marmot Dam on the mainstem of the Sandy River. The Marmot Dam diverted stream flows into tunnels and canals that transported the water north across the hydrologic divide that separated the mainstem

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204 See id.
205 The company eventually became Portland General Electric (PGE). See id. at 22.
206 See id.
207 See id.
210 See id.
211 See id. at 22.
Sandy River from the Little Sandy. The series of diversion channels, including nearly mile-long tunnels bored underneath the mountains separating the two watersheds, transported water from the Sandy River into the Little Sandy, upstream of the Little Sandy Dam. Since 1913, the Bull Run powerhouse supplied about twenty-two megawatts of electricity to consumers in the Portland area.

The original Marmot Dam consisted of a wood frame structure filled with rock and sediment to divert stream flows into the diversion canals. Engineers included a wooden fish ladder to allow salmon to travel upstream, and the dam never blocked upstream salmon passage to pristine spawning habitat above the dam. In 1989, the current dam owner, Portland General Electric (PGE) rebuilt the Marmot Dam by replacing the original thirty-foot wood frame and rocks with a forty-seven foot concrete structure, complete with modernized fish ladders. However, problems with downstream passage of salmon continued to wreak havoc on the river’s fish populations. The diversion channels funneled downstream migrating salmon into the long tunnels and canals, killing them or depositing them in the Little Sandy River.

\[212\text{See id.}\]
\[213\text{See id.}\]
\[214\text{See PGE, supra note 208.}\]
\[215\text{See Taylor, supra note 198, at 39.}\]
\[216\text{See id. at 23.}\]
\[217\text{See id. at 39.}\]
\[218\text{See id.}\]
\[219\text{See id. at 23.}\]
where they would face another dam and diversion to Roslyn Lake.\textsuperscript{220} Beginning in 1951, fishery biologists attempted to prevent salmon from entering the diversions with screens and collection points within the canals and tunnels.\textsuperscript{221} Despite these efforts, downstream passage remained perilous for migrating salmon.\textsuperscript{222}

The Bull Run hydroelectric project (Little Sandy and Marmot Dams, their diversions, and the Bull Run powerhouse) caused significant environmental declines in the Sandy River watershed. Historic salmon runs totaled tens of thousands of coho, fall and spring chinook, and winter steelhead.\textsuperscript{223} The dams and diversions reduced the Sandy River basin’s fish population to between ten and twenty percent of historic runs.\textsuperscript{224} The hydroelectric project also drastically reduced stream flows in the Sandy and Little Sandy Rivers.\textsuperscript{225} Although a 1973 agreement established minimum instream flows for the Sandy River below the Marmot Dam, the diversions continued to reduce flows and instream habitat for ten miles below the dams.\textsuperscript{226}

B. The Settlement Agreement to Remove the Dams

The history of the Little Sandy and Marmot dam removals in the Sandy River basin contrasts significantly with the sagas that unfolded in the Elwha and White

\hspace{1cm}\textsuperscript{220}\textit{See id.}
\textsuperscript{221}\textit{See id. at 24.}
\textsuperscript{222}\textit{See id.; FED. ENERGY REG. COMM’N, DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS), BULL RUN PROJECT, OREGON, FERC PROJECT NO. 477-024 117 (2003).}
\textsuperscript{223}\textit{See Taylor, supra note 198, at 1.}
\textsuperscript{224}\textit{See id.}
\textsuperscript{225} PGE possessed water rights to 800 cubic feet per second from the rivers. \textit{See id. at 22.}
\textsuperscript{226}\textit{See FERC DEIS, supra note 222, at 4, 5.}
Salmon basins. The Sandy River dams, like the Elwha, Glines Canyon, and Condit Dams produced profitable hydroelectricity for urban areas. Yet the operator of the Sandy River dams, PGE, decided early in the FERC relicensing process to surrender the license and remove the dams voluntarily. A settlement agreement signed by PGE, federal agencies, environmental organizations, and state and local governments in 2001 coincided with PGE’s license surrender to FERC. River restoration work began less than six years later, with PGE paying for the complete removal of the dams and diversion channels.

1. The Settlement Agreement and FERC License Surrender

The Little Sandy and Marmot Dams received their first FERC license in 1980, authorizing the hydroelectric dams to operate for a thirty-year term that expired in 2004. Near the end of the thirty-year period, PGE considered relicensing the project, but after studying the potential conditions and prescriptions associated with FERC relicensing, “PGE determined that the likely cost of environmental protection,

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227 See Becker, supra note 21, at 832 n. 135.
228 See id.; Taylor, supra note 198, at 21.
229 See Memorandum from PGE to FERC, Application to Amend and Surrender License (Nov. 12, 2002), at 1–2.
231 See Becker, supra note 21, at 832 n. 135.
233 PGE Application to Surrender, supra note 229, at 2.
mitigation, and enhancement measures associated with relicensing would make continued operation of the project uneconomical.” In 1999, PGE notified FERC that the company did not intend to relicense the dams. FERC responded by giving PGE until 2002 to develop a plan to surrender the current license and remove the dams.

In 2001, PGE convened a meeting of stakeholders, including environmental organizations, federal agencies, and state and local officials, to discuss removing the dams. The settlement agreement produced a timeline for removal and established that PGE would pay all costs of removal and restoration. All parties agreed that the Bull Run hydroelectric project would remain operational until November 2007, and that the Marmot and Little Sandy Dams would be removed in the fall of 2007 and 2008, respectively. In 2003, just eighteen months after entering the settlement agreement, PGE secured the necessary environmental approvals for dam removal, and FERC

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235 Id.
236 Id.
238 PGE, Joint Statement, supra note 234, at 3.
240 See Becker, supra note 21, at 835, n. 135.
completed an EIS on decommissioning the Bull Run hydroelectric project. FERC accepted PGE’s license surrender for the Little Sandy and Marmot Dams, and approved the decommissioning plan in 2004.

The process for approving dam removal in the Sandy River differed from projects on the Elwha and White Salmon Rivers in several respects. First, unlike the Elwha and White Salmon dams, the owner of the Sandy River dams agreed to pay for the complete removal without pre-determined cost-caps. PGE spent about $17 million on the dam removals, and the replacement electricity costs totaled over $5 million. Second, the state and local governments fully supported the Sandy River dam removals by signing the settlement agreement and supplying the necessary environmental authorizations in less than two years. Oregon also lacked a state environmental policy act, which Washington implemented in the Condit context, delaying dam removal. Third, unlike the Condit Dam where local landowners objected to the removal of Northwestern Lake’s recreational opportunities, the federal government owned much of the remote, unpopulated land surrounding the Sandy River dams, including the Mt.

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243 See FERC, Order Approving Decommissioning Plan, supra note 239.
244 See Becker, supra note 21, at 835, n. 135.
245 FERC, Application to Surrender, supra note 229, at 32–33.
246 See Becker, supra note 21, at 835 n. 135.
Hood National Forest and BLM lands. Few private individuals owned land near the Sandy River dams, and the Forest Service and BLM supported dam removal.

The removal process for the Sandy River dams also proceeded as a hydroelectric license surrender, not an amendment to a license renewal. PGE and FERC both understood the process for license surrender of a hydroelectric dam and, once PGE submitted the surrender request, FERC responded according to established regulations. In the Sandy River dam removals, the process of securing FERC approval occurred quickly because FERC now understood the procedures for license surrender, unlike in Condit where FERC struggled to determine how to treat an amendment for license renewal as license surrender.

2. The Removal Procedures

In September 2007, engineers used explosives to breach the Marmot Dam, releasing water and sediments trapped behind the dam. The explosion and sudden release of water washed much of the 900,000 cubic yards of sediment downstream, with the river eroding the remaining sediments in a matter of months. In November 2007, PGE shut off the Bull Run hydroelectric station and drained Roslyn Lake, ending the

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248 See Taylor, supra note 198, at 15.
249 See Settlement Agreement, supra note 230, at 76.
250 See id.
251 See 18 C.F.R. part 16 (2009).
252 See Becker, supra note 21, at 835, n. 135; supra Part III.B.2.
253 See Michael Milstein, Oregon’s Sandy River Successfully Reinvents Itself After Dam Removal, OREGONIAN, Jul. 30, 2008.
254 See id.
diversions and returning the rivers to natural flows. The final step in the dam removal process, removal of the Little Sandy Dam and diversion channels, occurred in November 2008.

C. Restoring the Sandy River Basin

PGE donated all lands that the company owned for the Bull Run hydroelectric project to a conservation organization, the Western Rivers Conservancy, which in turn provided the lands to the BLM for restoration projects. In the years following the Sandy River dam removals, the BLM engaged in restoration projects throughout the basin to return the ecosystem to its natural condition. After the removal of the dams, stream flows returned to natural levels, restoring 6.5 miles of salmon habitat in the upper Little Sandy River and ten miles in the lower Sandy River below the former Marmot Dam.

V. The Rogue River: Restoring the Wild and Scenic River

The Rogue River flows west for over 215 miles from its headwaters near Crater Lake to the Pacific Ocean. The river and its tributaries drain a significant land area in

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255 See FERC, Application to Surrender, supra note 229, at 3–4.
256 See Keil, supra note 237.
257 See FERC, FEIS, supra note 242, at 6.
259 See FERC, DEIS, supra note 222, at 4–5, 117.
southwest Oregon, cutting through three mountain ranges and across four climate zones. For thousands of years before non-native settlement, the Rogue River’s abundant fisheries sustained native tribes in the area, providing over 4,000 river miles of salmon habitat. As non-native settlers populated the Rogue Basin in the nineteenth century, the river became widely known for plentiful wild salmon—the largest population wholly in Oregon—and recreational opportunities. The narrow rock canyons and steep gradients through the Cascade Range make the Rogue River an extremely popular whitewater river. In 1968, Congress designated the Rogue among the first wild and scenic rivers, protecting eighty-four miles of the lower river from development and preserving habitat for the remaining wild salmon.

A. Fragmenting the River: Dams Throughout the Rogue Basin

During the late 1800s and early 1900s, human population growth and agricultural activities in the Rogue River Basin created a demand for water and power

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261 The basin drains an area of over 5,000 square miles. See OR. DEP’T OF ENVTL. QUALITY, ROGUE RIVER BASIN TMDL i (2008).

262 Id. at 1-3, 1-4; Whitworth, supra note 260, at 189.


264 The designated wild and scenic river portion extends from 7 miles west of Grants Pass to 11 miles east of Gold Beach. Bur. of Land Mgmt., supra note 260.

265 Whitworth, supra note 260, at 189.


267 Id.

to supply the region’s newest towns and farms.\textsuperscript{269} The Rogue Basin currently contains over eighty dams, ranging in size from small diversion dams to massive hydroelectric projects.\textsuperscript{270} Before dam removal on the Rogue began in 2008, returning adult salmon travelled over 107 miles from the Pacific Ocean in the near-pristine river before encountering their first dam at Savage Rapids.\textsuperscript{271} About twenty miles upstream from the Savage Rapids Dam, the Gold Hill and Gold Ray Dams further segmented the river, hindering salmon passage to the upstream stretches and tributaries.\textsuperscript{272} But since 2008, dam owners in the basin have removed the Savage Rapids, Gold Hill, and Gold Ray Dams\textsuperscript{273} and the U.S. Army Corps of Engineers notched a fourth, the Elk Creek Dam, located upstream from the three mainstem dams on Elk Creek, a major tributary of the Rogue.\textsuperscript{274}

1. \textit{Savage Rapids Dam}

In 1921, the Grants Pass Irrigation District (G PID), a privately organized irrigation group in Jackson and Josephine Counties, Oregon, constructed the Savage Rapids Dam about five miles east of Grants Pass, Oregon.\textsuperscript{275} Growing numbers of

\begin{itemize}
\item \textsuperscript{269}See Whitworth, \textit{supra} note 260, at 189.
\item \textsuperscript{270}\textsc{Arthur C. Benke \\& Colbert E. Cushing}, \textsc{Rivers of North America} 571 (2005).
\item \textsuperscript{272}See Kim Murphy, \textbf{Dam’s Demise Lets the Rogue River Run}, \textbf{The Seattle Times}, Oct. 10, 2009.
\item \textsuperscript{273} The dams are listed in geographic order from downstream to upstream. See Scott Learn, \textit{After Dam Removals, Oregon’s Rogue River Shows Promising Signs for Salmon}, \textit{Oregonian}, Oct. 28, 2010.
\item \textsuperscript{274}See Mark Freeman, \textbf{End of a Controversial Dam}, \textbf{Mail Tribune} (Medford, Oregon), Jul. 16, 2008.
\item \textsuperscript{275}\textsc{Bur. of Reclamation, Draft Environmental Assessment, Fish Passage Improvements, Savage Rapids Dam, Grants Pass Project, Oregon} 2 (2005) [hereinafter \textit{Savage Rapids DEA}].
\end{itemize}
settlers in southern Oregon during the early 1900s demanded large amounts of water for irrigation, and the Savage Rapids Dam provided the means to divert Rogue River water into a series of irrigation canals for delivery to farms throughout the region.\textsuperscript{276} The 39-foot, concrete gravity and arch dam\textsuperscript{277} created a small reservoir from which hydraulic turbines, a pumping plant, and gravity diversions channeled water into irrigation canals.\textsuperscript{278} Although the original dam included fish ladders, fish screens and a fish bypass system installed in the 1970s never succeeded in preventing downstream-migrating juvenile salmon from entrainment in the irrigation system.\textsuperscript{279}

The high levels of fish mortality at the irrigation intake pump contributed to calls for the dam’s removal.\textsuperscript{280} In 1994, Oregon’s Water Resources Commission granted an extension for GPID’s water right for withdrawal at Savage Rapids, but conditioned the extension on the GPID continuing to operate in a manner consistent with the public interest.\textsuperscript{281} The water right extension required GPID to exercise “due diligence in implementing approved conservation and fish passage plans” for Savage Rapids Dam,

\begin{flushleft}
\textsuperscript{276} The irrigation project consisted of over 160 miles of canals. See \textit{id}.
\textsuperscript{277} Engineers built the Savage Rapids Dam as a “combination gravity and multiple arch concrete dam.” \textit{id} at 3.
\textsuperscript{278} See \textit{id}.
\textsuperscript{279} Moreover, the most successful fish screens only managed to protect 90\% of fish in the stream. Plaintiff’s Complaint at 6, United States v. Grants Pass Irr. Dist. (D. Or. 1998) (No. 6-98-03034); see Whitworth, \textit{supra} note 260, at 191.
\textsuperscript{281} Whitworth, \textit{supra} note 260, at 196.
\end{flushleft}
which meant providing safe and effective fish passage for migrating salmon.\textsuperscript{282} The state commission interpreted the conditions in the water right to require removal of Savage Rapids Dam by 2001.\textsuperscript{283} In weighing the public interest factors, the agency concluded that dam removal would provide more benefits to the public than upgrading existing fish passage facilities and keeping the low-cost irrigation system in place.\textsuperscript{284}

Although GPID’s water right was conditioned on dam removal, members of the GPID board of directors and water users throughout the Rogue Basin remained steadfastly opposed to removing the Savage Rapids Dam.\textsuperscript{285} From 1994 to 1998, the GPID board stalled progress to secure federal authorization and funding for dam removal.\textsuperscript{286} Some GPID board members expressed their desire to “save Savage Rapids Dam” in letters to members of Oregon’s congressional delegation,\textsuperscript{287} citing the dam’s benefits to the local community, including providing recreation on the reservoir, supplying low-cost irrigation, and maintaining high property values near the reservoir.\textsuperscript{288} The GPID remained committed to the tradition and symbolism of the Savage Rapids Dam, refusing a deal with the federal government in which the

\textsuperscript{282} Cancellation of Permit No. 50957, and the Denial of the Request for Modification of Implementation Schedules, Oregon Water Resources Commission 21 (1998) [hereinafter Final Order].
\textsuperscript{283} \textit{Id}; see Whitworth, \textit{supra} note 260, at 196.
\textsuperscript{284} See Whitworth, \textit{supra} note 260, at 196.
\textsuperscript{285} See id. at 198–99.
\textsuperscript{286} Id.
\textsuperscript{287} Final Order, \textit{supra} note 282, at 9 (citing a letter from the GPID board chairman to State Senator Brady Adams); see Whitworth, \textit{supra} note 260, at 198–99.
government would pay for dam removal and purchase replacement water pumps.\footnote{See Grossman, \textit{supra} note 43, at 147.}

Between 1998 and 2000, the GPID expended about one-third of the district’s operating budget, over $780,000, on legal fees fighting against dam removal, including opposing changes to the district’s water rights, challenging the imposition of fish mitigation measures, and suing former district patrons who attempted to leave the district and cancel individual water rights.\footnote{Id. at 147–40}

Frustrated with the slow progress toward removing the Savage Rapids Dam, in 1998, the Water Resources Commission determined that the GPID had violated the terms of its water right by failing to diligently provide fish conservation measures.\footnote{See Final Order, \textit{supra} note 282, at 21.} At a 1998 hearing examining the GPID water rights, the Commission reduced GPID’s diversion right by fifty percent\footnote{Whitworth, \textit{supra} note 260, at 201.}—an action that the Oregon Court of Appeals subsequently affirmed.\footnote{Grants Pass Irr. Dist. v. Water Res. Dep’t, 1 P.3d 480 (Or. App. 2000).} Environmentalists and federal agencies renewed their efforts pushing for removal and joined the Commission in taking action against the GPID.\footnote{See Whitworth, \textit{supra} note 260, at 200–01. Environmental groups, federal agencies, and tribes had been advocating for dam removal since the 1980s. \textit{Id.}} In 1998, NMFS filed a lawsuit against the GPID, alleging illegal takings of threatened coho salmon by the irrigation project.\footnote{Plaintiff’s Complaint at 6, United States v. Grants Pass Irr. Dist. (D. Or. 1998) (No. 6-98-03034).} NMFS called the Savage Rapids Dam the “worst fish
killer on the Rogue” and conditioned any ESA incidental-take permit for continued operation of the irrigation project on dam removal.

The actions of the Commission and NMFS gave GPID little alternative to removal. After studies indicated that dam removal provided the least expensive means of solving the fish mortality problem, the GPID board of directors passed a resolution authorizing the removal of the dam. Under the GPID removal plan, pumping plants along the river near the dam site would continue to supply water to the irrigation system after dam removal. A vote of 6,700 members of the GPID resulted in overwhelming support for dam removal, clearing away opposition within the local community and allowing the board to take proactive measures to implement removal plans. In 2001, GPID entered a consent decree with NMFS, agreeing to seek federal approval and funding to completely remove the dam by November 2006.

To fund the removal of the Savage Rapids Dam, the GPID needed the support of the federal government. The ensuing political process to secure federal authorization

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296 Whitworth, supra note 260, at 184.
297 Id. at 201.
298 See id.
299 See Whitworth, supra note 260, at 191.
300 Id.
301 Id. at 201–02.
302 Notice of Intent to Prepare an Environmental Assessment (EA) to Determine the Need for a Supplemental Environmental Impact Statement (EIS), 69 Fed. Reg. 29,144, 29,144 (May 20, 2004).
303 See Whitworth, supra note 260, at 202.
and funding resembled the saga that unfolded for the Elwha dam removals.\textsuperscript{304} Like Elwha, funding for the Savage Rapids Dam removal came in stages.\textsuperscript{305} In 2000, Oregon’s congressmen introduced the Savage Rapids Dam Act,\textsuperscript{306} which would have provided $22.5 million for the complete deconstruction of the dam.\textsuperscript{307} Although Congress failed to pass this bill, the federal government appropriated $500,000 to study dam removal in the Rogue basin.\textsuperscript{308} Then, in 2004, Congress’ energy and water appropriations bill authorized the Bureau of Reclamation to install replacement pumps to supply water for the GPID and to remove the dam.\textsuperscript{309} Between 2007 and 2008, Congress appropriated over $28 million for the Savage Rapids Dam removal.\textsuperscript{310}

Once the Bureau of Reclamation received the funding, removal proceeded quickly because federal and state agencies and the local community supported dam removal.\textsuperscript{311} The Bureau supplemented a 1996 EIS studying dam removal, received a federal section 404 permit, Oregon’s section 401 certification, and the support from

\textsuperscript{304}See supra notes 101-11 and accompanying text. See also Whitworth supra note 260, at 202 (describing the positions of Oregon Senators Gordon Smith and Ron Wyden, both of whom supported dam removal as well as federal spending to upgrade the irrigation system in Grants Pass).

\textsuperscript{305}See supra notes 101-11 and accompanying text.


\textsuperscript{307}Whitworth, supra note 260, at 202.

\textsuperscript{308}Id.


\textsuperscript{310}Whitworth, supra note 260, at 202.

other consulting agencies. 312 The removal occurred in 2009, beginning with the construction of an upstream cofferdam that allowed engineers to deconstruct the dam in stages.313 Less than five months after deconstruction began, the Rogue River flowed through Savage Rapids, eroding over 150,000 cubic yards of sediments from the reservoir within two weeks.314 Removal of the Savage Rapids Dam allowed unimpeded passage to more than fifty miles of mainstem Rogue and 500 miles of upstream habitat for salmon spawning,315 increasing the Rogue’s salmon population by about 114,000 fish by 2012.316

2. Gold Hill Dam

Fifteen miles upstream from the Savage Rapids Dam, a small concrete diversion dam blocked migrating salmon from continuing their journey up the Rogue River.317 In the late 1800s, cement manufacturers began operating in Gold Hill, Oregon, using massive amounts of river water diverted through canals in connection with cement production.318 In the early 1920s, a cement company constructed what was the first

312 See BUR. OF RECLAMATION, FINDING OF NO SIGNIFICANT IMPACT, FISH PASSAGE IMPROVEMENTS, SAVAGE RAPIDS DAM, GRANTS PASS, OREGON 5, 7 (2006).
313 Dam removal occurred in two phases. First, engineers diverted the river around the dam on the right side of the river while workers removed the left half the dam. Second, the engineers shifted the cofferdam to direct the river to flow through the left half of the channel while workers removed the right half.
315 Waterwatch, supra note 271.
316 Id.
concrete diversion dam on the Rogue at Gold Hill.\textsuperscript{319} In 1944, the company reconstructed the Gold Hill Dam, adding a powerhouse for hydroelectric generation capable of producing twenty-five kilowatts—enough power to operate the cement factory with excess to sell to residents of the area.\textsuperscript{320} Although small in stature, the three- to fourteen-foot tall concrete dam posed problems for migrating salmon.\textsuperscript{321} The dam provided fish ladders and fish screens, but failed to prevent fish mortality from upstream and downstream-migrating salmon that entered the diversion canals.\textsuperscript{322}

In 1969, cement production in Gold Hill ended, and the owner-operators of the dam abandoned the structure, which reverted to the City of Gold Hill.\textsuperscript{323} The city unsuccessfully attempted to sell the dam and powerhouse to electric utilities, including PacifiCorp, throughout the 1980s.\textsuperscript{324} Although the powerhouse had been shut off since 1969, the city continued to use the dam and diversion channels to supply water for irrigation and municipal use, but the dam contributed an insignificant amount of water use in the region.\textsuperscript{325}

\begin{footnotesize}
\begin{enumerate}
\item Id. \textsuperscript{319}
\item Id. \textsuperscript{320}
\item Kramer, supra note 318, at 5. \textsuperscript{322}
\item Id. \textsuperscript{323}
\item Id. at 6. \textsuperscript{324}
\item Id. \textsuperscript{325}
\end{enumerate}
\end{footnotesize}
Growing interest in dam removal and river restoration as a way to increase wild salmon populations in the Rogue led to proposals to remove the Gold Hill Dam.\textsuperscript{326} Because of the insignificant water diversions, the NMFS pressured the city to remove the dam in order to facilitate coho salmon recovery.\textsuperscript{327} In 2006, the city acquired a replacement water intake facility, a pump station placed in the Rogue 150-feet upstream from the dam.\textsuperscript{328} The replacement water supply system made the Gold Hill Dam obsolete and led to the city’s decision to remove the dam.\textsuperscript{329}

The process of dam removal at Gold Hill proceeded in a manner similar to that of the Sandy River dams.\textsuperscript{330} In both cases, private funding and near-unanimous support for removal produced a short time frame from dam removal proposal to project completion.\textsuperscript{331} In Gold Hill, the city secured private grants to completely fund the $4 million removal costs and spent less than one year acquiring permits from federal and state agencies— all of which supported dam removal.\textsuperscript{332} In the Gold Hill community, few residents opposed dam removal, mostly because the dam provided de minimis benefits.\textsuperscript{333} The only complaints from the community had to do with concerns about the

\textsuperscript{326}See Sanne Specht, Gold Hill’s Dam Set for Removal Next Year, \textit{MAIL TRIBUNE} (Medford, Oregon), Jul. 14, 2007.
\textsuperscript{327}Id.
\textsuperscript{328}Id.
\textsuperscript{329}Id.
\textsuperscript{330}See supra Part IV.B.1.
\textsuperscript{331}Compare supra Part IV.B.1 with discussion in Specht, supra note 326.
\textsuperscript{332}See Specht, supra note 326 (noting that the project received two large grants from the Oregon Watershed Enhancement Board).
\textsuperscript{333}Id.
\textsuperscript{334}Id.
loss of the small reservoir for recreation and the minor costs associated with replacing irrigations lines with longer pipes to reach the river once the channel narrowed.  
During the summer of 2008, engineers removed the concrete structure, allowing the Rogue to flow freely through Gold Hill for the first time in ninety years.

3. Gold Ray Dam

Five miles upstream from the Gold Hill Dam, one of the oldest structures in the Rogue River presented another obstacle for migrating salmon. In 1905, workers completed the original Gold Ray Dam, a structure built as a log-crib dam with a hydroelectric generator capable of producing 750 kilowatts. Hydroelectric power from Gold Ray supplied electricity for much of the Rogue Basin throughout the first half of the century. In 1941, the dam operators, Condor Water and Light Company, constructed a replacement dam on the same site as the original log-crib structure. The newly constructed concrete gravity dam, which retained the name Gold Ray Dam,

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336 Specht, supra note 326.
339 Id.
340 Id.
341 A log-crib dam uses a timber frame to hold rocks and gravel in place to block the river. A concrete gravity dam consists of concrete blocks held in place by gravity. See THE H. JOHN HEINZ III CENTER FOR SCIENCE, ECONOMICS AND THE ENVIRONMENT, DAM REMOVAL: SCIENCE AND DECISION MAKING 26–27 (2002),
stood thirty-eight feet tall and continued to generate profitable amounts of hydroelectric
tower serving the surrounding area. Eventually, Condor Water and Light Company
sold the Gold Ray Dam to the Rogue River Electric Company, which later sold the dam
to PacifiCorp.

In 1972, the dam owner-operator, now PacifiCorp, abandoned the Gold Ray
Dam, allowing ownership of the structure to revert to Jackson County. From the
outset, Jackson County encountered severe financial and regulatory problems
associated with the maintenance of the aging dam. Although the dam no longer
produced hydropower, Jackson County faced escalating costs of repairing the dam and
replacing the decades-old fish ladders that failed to meet current NMFS and Oregon
Department of Fish and Wildlife standards. Estimates placed the removal costs of the
dam at $5 million, compared to over $15 million for ordinary maintenance, and over $60
million to refurbish the dam to generate uneconomical amounts of hydropower. In
addition to ordinary maintenance and fish ladder costs, concerns over the safety of the
concrete structure forced Jackson County to consider removal as the only viable option


NMFS, BIOLOGICAL ASSESSMENT FOR THE REMOVAL OF GOLD RAY DAM 1 (2010) [hereinafter Gold Ray BA].
Id.
Id.
Id. at 2.
Id.
Id.
for the dam.\textsuperscript{348} By 2008, the county decided to seek federal funding to facilitate dam removal.\textsuperscript{349}

In 2009, the county received a $5 million grant from NOAA under the American Recovery and Reinvestment Act (the Obama Stimulus) and began the process of permitting the dam removal.\textsuperscript{350} Like the Gold Hill and Sandy River dams, few local interests opposed removing the Gold Ray Dam, largely because the dam had outlived its usefulness.\textsuperscript{351} In June 2010, removal work began on the dam site, using a two-stage process of dam removal similar to that implemented at Savage Rapids.\textsuperscript{352} Yet, just as work on the removal began, some local citizens filed a lawsuit to halt the dam’s deconstruction.\textsuperscript{353}

The opponents who sued Jackson County claimed that removing the dam violated county land use regulations, destroyed wetlands, harmed structures of historical significance, and damaged water quality.\textsuperscript{354} In July 2010, Oregon’s Land Use Board of Appeals dismissed the case, affirming the county’s ability to proceed as planned in removing Gold Ray Dam.\textsuperscript{355} Two weeks after the lawsuit, deconstruction

\textsuperscript{348}Id.
\textsuperscript{349}Id.
\textsuperscript{350}Id.
\textsuperscript{351}See supra Part IV.B.1.
\textsuperscript{352}Gold Ray BA, supra note 342, at 2.
\textsuperscript{353}See Mark Freeman, Dam Demolition May Be Delayed More than a Month While LUBA Reviews Appeal, MAIL TRIBUNE (Medford, Oregon) (Jun. 26, 2010).
\textsuperscript{354}See id.
\textsuperscript{355}See Shock v. Jackson Co., 61 Or. LUBA 403, 404 (2010), 2010 WL 3044236 (Or Luba); Mark Freeman, Land-use Board Rejects Appeal to Halt Removal, MAIL TRIBUNE (Medford, Oregon) (Jul. 3, 2010).
work resumed, and the engineers completely removed the dam by the end of the summer of 2010.\textsuperscript{356} After more than a century, the mainstem of the Rogue flowed freely from its upper reaches to the Pacific Ocean.\textsuperscript{357}

4. Elk Creek Dam

The fourth major obstacle to fish migration in the Rogue Basin was a partially completed flood control dam on Elk Creek, one of the Rogue’s major tributaries and a significant salmon spawning stream.\textsuperscript{358} In 1955, massive floods in the Rogue Basin led to a congressional authorization for a series of dams in order to supply irrigation water, provide recreation benefits, and control the rivers flows, thus relieving downstream concerns about flooding.\textsuperscript{359} The Rogue River Basin flood control project proposed to build three dams under the supervision of the Army Corps of Engineers.\textsuperscript{360} In 1977, the Corps completed the William L. Jess Dam on Lost Creek, a tributary upstream from the Elk Creek-Rogue confluence.\textsuperscript{361} Three years later, in 1980, workers finished construction of the second dam, the Applegate Dam, located on a downstream tributary of the Rogue.\textsuperscript{362} The Corps proposed to build the third dam on Elk Creek, 1.5 miles upstream

\begin{footnotes}
\item[356] Id.
\item[357] Id.
\item[360] Id.
\item[362] Id.
\end{footnotes}
from the stream’s confluence with the Rogue. In 1980, construction of the Elk Creek Dam began; however, litigation and a political fight over the wisdom of damming Elk Creek soon forced the Corps to abandon its efforts to complete the dam.

After three years of construction, environmentalists concerned about the effects that the dam would have on anadromous fish turned to the courts to stop construction of the Elk Creek Dam. The environmental groups, led by the Oregon Natural Resources Council, claimed that the Corps violated the National Environmental Policy Act (NEPA) by failing to adequately analyze the environmental effects of the dam, particularly the agency’s failure to conduct a sufficient cumulative impacts analysis, mitigate the environmental impacts, supplement the dam’s environmental impact statement (EIS), and conduct a “worst case analysis” of potential but uncertain effects.

In Marsh v. Oregon Natural Resources Council, the Ninth Circuit ruled in favor of the environmentalists, concluding that the Corps’ environmental analysis violated NEPA and issued an injunction barring the Corps from completing the dam until it adequately analyzed the dam’s potential environmental effects. However, in 1989, the Supreme

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363 Matthew Preusch, Salmon Runs on Rogue Expected to Revive Once Dams Come Down, OREGONIAN (Jun. 9, 2008).
364 See Oregon Wild, supra note 358.
365 See e.g., Mark Freeman, End of a Controversial Dam, MAIL TRIBUNE (Medford, Oregon) (Jul. 16, 2008).
368 Oregon Natural Resources Council v. Marsh, 820 F.2d 1051, 1051 (9th Cir. 1987), rev’d, 490 U.S. 360 (1989)
Court partially reversed the Ninth Circuit, upholding the Corps’ EIS on the mitigation, supplemental EIS, and “worst case” analysis claims.\(^ {369} \)

Although the Supreme Court validated part of the Corps’ NEPA analysis in *Marsh*, the Elk Creek Dam never was completed.\(^ {370} \) Between 1992 and 1995, the USFS, BLM, and NMFS concluded that the Elk Creek Dam would unreasonably damage wild anadromous fish populations in the Rogue Basin.\(^ {371} \) In 1994, the federal court for the District of Oregon renewed the injunction prohibiting further dam construction and required the Corps to conduct a new analysis considering the effects of the dam on the Rogue’s salmon runs,\(^ {372} \) a decision upheld by the Ninth Circuit.\(^ {373} \) In 1995, the Corps determined that the financial costs of legal challenges, environmental studies, necessary fish passage facilities, and continued construction outweighed the potential gains of the dam.\(^ {374} \) Consequently, the agency abandoned the Elk Creek Dam, leaving one-third of the eighty-three-foot structure blocking the stream channel—preventing fish passage in


\(^ {370} \) The Corps did not appeal the Ninth Circuit’s conclusion that it failed to conduct an adequate cumulative impacts analysis; thus, even though the Corps prevailed on the issue before the Supreme Court, the injunction against the dam’s completion remained in effect. *Oregon Natural Resources Council*, 490 U.S. at 363. See U.S. Army Corps of Engineers, Elk Creek, http://www.nwp.usace.army.mil/locations/elkcreek.asp (last visited Apr. 15, 2012).


\(^ {372} \) *Oregon Natural Resources Council v. Marsh*, 845 F.Supp. 758, 763 (D. Or. 1994) (relying on the Wild and Scenic Rivers Act to conclude that the Corps must consider downstream effects on anadromous fish).

\(^ {373} \) *Oregon Natural Resources Council v. Marsh*, 52 F.3d 1485, 1490 (9th Cir. 1995); see *Oregon Wild*, *supra* note 358.

\(^ {374} \) See *id*. 
Elk Creek and providing no economic or flood control benefits to the human community.\textsuperscript{375}

Once the Corps decided not to complete the dam, a political controversy erupted over the future of the partially finished dam that continued to hinder the recovery of threatened salmon species.\textsuperscript{376} Like the political debate over funding for dam removals on the Elwha River, the controversy over the future of the Elk Creek Dam featured two conflicting views and passionate advocates arguing for and against dam removal.\textsuperscript{377} On one side of the debate, a few powerful political figures opposed removing the dam, preferring instead that the Corps maintain the structure to preserve the possibility of finishing the dam in the future.\textsuperscript{378} On the other side, a coalition of organizations and government agencies championed dam removal to promote anadromous fish recovery and serve the public interest by restoring the natural flow of the river.\textsuperscript{379} Toward the end of a thirteen-year debate,\textsuperscript{380} one of the key political figures who opposed dam removal, Representative Greg Walden notified the Corps that any efforts to remove or notch\textsuperscript{381} Elk Creek Dam would not be funded by Congress, and that the Corps should continue its existing salmon transportation plan, which consisted of trapping salmon

\textsuperscript{375}See U.S. Army Corps of Engineers, \textit{supra} note 370.
\textsuperscript{376}See Oregon Wild, \textit{supra} note 358. NMFS added the Rogue’s coho salmon to the ESA list of threatened species in 1997.
\textsuperscript{377}See \textit{supra} Part II.B.2; \textit{id}.
\textsuperscript{378}See Mortensen, \textit{supra} note 359.
\textsuperscript{379}See Oregon Wild, \textit{supra} note 358.
\textsuperscript{380}The political controversy lasted from about 1995 to 2008. See \textit{id}.
\textsuperscript{381}See \textit{supra} note 114 and accompanying text, on “notching” a dam.
below the dam and trucking the fish above the dam.\textsuperscript{382} Congressman Walden’s opposition to dam removal culminated in an unsuccessful attempt in 2003 to eliminate funding for the Corps.\textsuperscript{383}

Ultimately, Congressman Walden and the dam removal opponents could not match the overwhelming public and scientific support in favor of removing or notching Elk Creek Dam.\textsuperscript{384} Since the early 1990s, NMFS expressed concerns that the dam failed to provide effective fish passage, and that no other more effective techniques, including fish ladders, demonstrated promise to redress the issue of fish passage at Elk Creek Dam.\textsuperscript{385} The Corps’ scientists eventually agreed with NMFS, concluding that only removing or notching the dam could achieve effective fish passage.\textsuperscript{386} Elk Creek historically provided a significant amount of the Rogue Basin’s spawning habitat, accounting for forty-four percent of upper Rogue coho spawning and fifteen to twenty percent of upper Rogue steelhead spawning habitat.\textsuperscript{387} In 2001, a NMFS Bi-Op concluded that unless the Corps notched Elk Creek to allow for fish passage, coho salmon, a listed threatened species, would face extinction.\textsuperscript{388}

\textsuperscript{382}See id; U.S. ARMY CORPS OF ENGINEERS, EVALUATION OF THE EFFECTS OF ELK CREEK DAM ON MIGRATORY SALMONIDS 2–3 (2007).
\textsuperscript{383}See Oregon Wild, supra note 358.
\textsuperscript{384}See id.
\textsuperscript{385}Id.
\textsuperscript{386}Id. supra note 358.
\textsuperscript{388}Margaret B. Bowman, Legal Perspectives on Dam Removal, 52 BOSCIENCE 739, 741 (2002).
With the scientific debate over the merits of notching settled, advocates for river restoration increased pressure on the Corps to notch Elk Creek Dam.\textsuperscript{389} In 2002, Oregon Governor John Kitzhaber urged the Corps to notch the dam in order to boost economic value of the Rogue’s fishery and recover coho stocks.\textsuperscript{390} Other groups pointed out the expense and inefficiencies of the Corps’ fish transportation plan: both Taxpayers for Common Sense and environmental groups called the plan a waste of taxpayer’s money and urged Congress to force the Corps’ to notch the dam.\textsuperscript{391}

In 2007, the Corps finally acquiesced and released a plan to notch Elk Creek Dam by demolishing the middle section of the structure, allowing the stream to run through a reclaimed channel.\textsuperscript{392} Beginning in July 2008, nine controlled blasts destroyed the concrete sections of the dam in the middle of the creek.\textsuperscript{393} During the summer of 2008, the Corps provided re-vegetation, stream bank stabilization, and stream channel reclamation for a one-mile reach of Elk Creek.\textsuperscript{394} Engineers cleared concrete from the streambed, but left the concrete remnants of the unfinished dam on either side of the stream, framing the river as it flows through the former dam site.\textsuperscript{395}

\textsuperscript{389} Oregon Wild, \textit{supra} note 358.
\textsuperscript{391} Oregon Wild, \textit{supra} note 358 .
\textsuperscript{393} \textit{Id}.
\textsuperscript{394} \textit{Id}.
\textsuperscript{395} \textit{Id}.
B. Restoring the Rogue River

Almost immediately after the removal of the three mainstem Rogue dams, the river’s salmon fishery showed signs of recovery.396 In 2010, biologists found thirty-one redds in the Rogue where the Gold Ray reservoir once stood, and sixty-three in the former Savage Rapids reservoir.397 With the continuation of river restoration projects, including stream bank stabilization throughout the basin, biologists and fishermen are optimistic that salmon populations will rebound.398

VI. The Klamath River Basin: Looking Ahead to Future Dam Removals

To the south of the Rogue Basin, the Klamath River flows from its headwaters in the Cascade Range near Klamath Falls, Oregon, for over 263 miles to its mouth at the Pacific Ocean in northern California.399 The Klamath carves a course through two distinct geographic areas—the dry, high desert of southern Oregon, where water derives primarily from spring snowmelt;400 and the wet, temperate cline of northern California, where rainfall and numerous tributaries401 increase the river’s discharge.402

396See Learn, supra note 273, at 1.
397Id.
398See id.
401The lower Klamath River’s principle tributaries include the Trinity, Shasta, Scott, and Salmon Rivers. See NATIONAL MARINE FISHERIES SERV., KLAMATH RIVER BASIN, 2009 REPORT TO CONGRESS 2 (2009).
Historically one of the most biologically productive streams in the Pacific Northwest, the Klamath yielded abundant runs of anadromous fish, averaging almost a million spawning salmon per year. For over 4,500 years, the Klamath Tribes have relied on the river’s salmon and sucker fish as staple food sources and pillars of their cultural identity. Unfortunately, hydroelectric dams, irrigation projects, and recent droughts nearly destroyed the Klamath’s wild salmon population—current salmon runs number only about six percent of historic levels. Throughout most of its modern history, controversy and political strife have dominated the Klamath Basin, including conflicts over virtually every major western water issue—dams, water rights, and endangered species.

A. Setting the Stage for the Klamath Controversy

Non-native settlement and population growth in the Klamath Basin began in the middle of the nineteenth century as miners and pioneers flocked to the resource-rich

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403 See Doremus & Tarlock, supra note 400, at 289–91. The Klamath River Basin covers an area of over 12,100 square miles. See Powers et al., supra note 399, at 1.
405 The Klamath Tribes include the Klamath, Modocs, and Yahooskin peoples of the upper basin; and the Karuk and Yurok tribes of the lower basin. See Daniel McCool, Rivers of the Homeland: River Restoration on Indian Reservations, 16 CORNELL J.L. & PUB. POL’Y 539, 549–50 (2007).
406 See id. at 551–52.
407 In 1992, only 32,000 salmon returned to spawn in the Klamath Basin. See Robert A. McFarlane, The Imperiled Klamath River Salmon A Troubled History and A Hopeful Future Under the Central Valley Project Improvement Act, 1 WEST-NORTHWEST J. OF ENVT. L., POL’Y THOUGHT 89, 93 (1994).
408 See McCool, supra note 403, at 549 (noting that the “Klamath has become infamous for conflict”).
area pursuing gold, timber, and farmland. In 1905, the U.S. Bureau of Reclamation authorized the construction of hydroelectric dams and irrigation canals throughout the basin, which eventually supplied electricity and water to over 200,000 acres of arid farmland in Oregon and California. Currently, the mainstem of the Klamath River contains five dams, including four hydroelectric dams, which are owned and operated by PacifiCorp as part of the Klamath Hydroelectric Project. The combined effects of dams and irrigation, however, blocked the Klamath to salmon migration and dewatered the river, destroying fish spawning habitat and leaving the once-abundant salmon in danger of extinction.

1. Dam Building for Power

In 1913, construction began on the first in a series of dams planned as part of an ambitious hydroelectric project on the mainstem of the Klamath River. The California

\[\text{See Mark Clark & Earl D. Miller, Notes on Early Water Use in the Klamath Basin, 13 J. OF THE SHAW HISTORICAL LIBRARY 19, 20–23 (1999).} \]
\[\text{The five mainstem dams are the Keno, J.C. Boyle, Copco No.1, Copco No.2, and the Iron Gate Dams. In addition, the Klamath Basin contains two dams on tributary streams: the Link River Dam and Fall Creek Dams. See David N. Allen, The Klamath Hydroelectric Settlement Agreement: Federal Law, Local Compromise, and the Largest Dam Removal Project in History, 16 HASTINGS W.-N.W. J. ENVTL. L. & POL’Y 427, 444, n. 132 (2010).} \]
\[\text{See id. at 443.} \]
\[\text{See GEORGE KRAMER, KLAMATH HYDROELECTRIC PROJECT (FERC NO. 2082) HISTORIC CONTEXT STATEMENT 40 (2003).} \]
Oregon Electric Company (COPCO) initiated the Klamath Hydroelectric Project by building two concrete arch hydroelectric dams in Ward’s Canyon, 198 miles upstream from the Klamath’s mouth.\footnote{See id. at 39–44; G&G ASSOCIATES, KLAMATH RIVER DAM REMOVAL INVESTIGATION 3 (2003), available at avahhttp://sunsite2.berkeley.edu:8088/cdri/search.execute.logic?xdam=Copco+No.1+Dam&item=11 (last visited May 28, 2012).} Five years after construction began, COPCO completed the first structure, Copco No.1, a massive 120-foot dam that generated twenty megawatts of electricity.\footnote{See Kramer, supra note 413, at 40; G&G Associates, supra note 414, at 3.} In 1925, engineers completed the second dam, Copco No.2, which stood twenty-feet tall at a quarter mile downstream from Copco No.1.\footnote{See John C. Boyle, COPCO No.1 and No.2, 50 Yeas on the Klamath, http://www.klamathbasincrisis.org/history/copco1-2boyle.htm (last visited May 28, 2012).} Together the two dams generated forty-seven megawatts of electricity and completely blocked salmon access to seventy-five miles of the upper Klamath River.\footnote{See Allen, supra note 410, at 444, n. 133; OFFICE OF ENERGY PROJECTS, FED. ENERGY REGULATORY COMM’N, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR RELICENSING OF THE KLAMATH HYDROELECTRIC PROJECT NO. 2082-027, at §§ 2.1.1.4, 2.1.1.5 (Nov. 16, 2007), available at http://www.ferc.gov/industries/hydropower/enviro/eis/2007/11-16-07.asp [hereinafter Klamath EIS]; Klamath Forest Alliance, Klamath River, http://www.klamathforestalliance.org/Issuesdatabase/klamathriver.htm (last visited May 28, 2012).} As farms grew and more fields required irrigation, an increasing demand for electricity led to the expansion of the Klamath Hydroelectric Project.\footnote{See Clark & Miller, supra note 408, at 23.} In 1958, workers completed the Big Bend Dam, later renamed the J.C. Boyle Dam, twenty-five miles upstream from the Copco Dams.\footnote{PACIFICORP, EXHIBIT C: CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION, KLAMATH HYDROELECTRIC PROJECT (FERC No. 2082) 4-1 (2004).} The sixty-eight-foot earthen-fill dam generated
ninety megawatts of electricity for COPCO’s power customers in the Klamath Basin.\textsuperscript{420} Because the construction of the J.C. Boyle Dam occurred after the Federal Water Power Act of 1935, COPCO required a permit for construction and operation of the dam.\textsuperscript{421} In 1954, COPCO received a fifty-year license for the J.C. Boyle Dam, later transferred to PacifiCorp after the two companies merged, and PacifiCorp took over management of the Klamath Hydroelectric Project.\textsuperscript{422}

In 1959, the California Fish and Game Department and the downstream Klamath fishing industry threatened to sue PacifiCorp over the wildly fluctuating water releases from the Copco and J.C. Boyles Dams.\textsuperscript{423} PacifiCorp generated power from the three dams by releasing stored water from the reservoirs at times of high electricity demand.\textsuperscript{424} This produced drastically varying downstream river levels that harmed fish and water quality in the lower Klamath.\textsuperscript{425} In order to avert the lawsuit and better regulate flows on the Klamath, Pacificorp agreed to build a new dam downstream from the Copco Dam. \textsuperscript{426} In 1962, PacifiCorp completed the massive Iron Gate Dam, which

\begin{itemize}
\item \textsuperscript{420}See id. at 4-1, 4-2.
\item \textsuperscript{421}See Klamath Off-Project Water Users, Inc. v. PacifiCorp, 240 P.3d 94, 96 (Or. Ct. App. 2010).
\item \textsuperscript{422}See id. COPCO and PacifiCorp merged in 1961. Id.
\item \textsuperscript{423}See HOLLY D. DOREMUS & A. DAN TARLOCK, WATER WAR IN THE KLAMATH BASIN: MACHO LAW, COMBAT BIOLOGY, AND DIRTY POLITICS 79 (2008) [hereinafter Water War]
\item \textsuperscript{424}See id.
\item \textsuperscript{425}See id.
\item \textsuperscript{426}See id.; G&G Associates, supra note 414, at 3.
\end{itemize}
stood 173-feet tall, was composed of rock and gravel fill materials, and generated eighteen megawatts of electricity. 427

After completion of the Iron Gate Dam, the Klamath Hydroelectric Project consisted of four hydroelectric dams, with a rated capacity of 168 MW. 428 Currently, the four dams produce closer to 81 MW 429 supplying power to farms and about 70,000 homes throughout the Klamath Basin. 430 Without fish passage facilities at the three downstream dams, Iron Gate and Copco Nos. 1 and 2, the Klamath Hydroelectric Project completely blocked migratory fish access to over 300 miles of the upper Klamath River and tributary streams. 431

2. Irrigating the Upper Klamath Basin

Coinciding with the start of dam construction on the Klamath, the Bureau of Reclamation began a massive irrigation project to drain marshlands and deliver water

427 See Water War, supra note 423, at 79; G&G Associates, supra note 414, at 18.
428 Until 2006, PacifiCorp contracted with the Bureau of Reclamation to operate two government dams. The Link River and Keno Dams are primarily flow-regulating dams located near the Klamath’s headwaters, at river miles 254 and 233, respectively. A twenty-two mile reservoir formed behind the Keno Dam supplies water to 41 percent of lands irrigated by the Klamath Irrigation Project. See Allen, supra note 410, at 444, n. 132. The contract between PacifiCorp and the BOR required the Klamath’s flows to be regulated to ensure the availability of irrigation water in the reservoir. The Link River Dam also supplies water to two powerhouses, the Eastside and Westside Powerhouses, which have a combined generating capacity of 4.7 MW and are technically part of the Klamath Hydroelectric Project. Id.
429 See Allen, supra note 410, at 444.
430 See id. at 445; ANNA LEON-GUERRO, SOCIAL PROBLEMS: COMMUNITY, POLICY, AND SOCIAL ACTION 415 (2010);
431 The J.C. Boyle Dam received upstream and downstream fish passage facilities; however, the Klamath Hydroelectric Project and the Keno and Link River Dams blocked 570 miles of the Klamath and its tributaries to fish migration. See Allen, supra note 410, at 446.
from the Klamath River to farms in the upper basin.\footnote{See Davidson, supra note 409, at 534.} In 1905, the Bureau started constructing water storage dams, reservoirs, and over 185 miles of canals—all part of the Klamath Irrigation Project.\footnote{See id. at 535.} The federal government’s policy of transforming the arid upper Klamath Basin into productive farmland through subsidized irrigation gained momentum in 1917 when the government opened public lands to homesteaders who paid only a small fee in exchange for the delivery of irrigation water.\footnote{See id.}

With the continuously growing population and demand for water, the federal government enacted the Klamath River Basin Compact to govern the orderly development of the basin.\footnote{See Klamath River Basin Compact of 1957, Pub. L. No. 85-222, 71 Stat. 497 (1957).} The 1957 Compact prioritized irrigation over all other water uses in the basin, including domestic consumption and instream flows for fish and wildlife.\footnote{See Davidson, supra note 409, at 536. Apparently, water conservation was one of the stated goals of the Compact, a goal that seems to have been lost between Washington, D.C. and Oregon.} Currently, the Klamath Irrigation Project supplies water to over 200,000 acres of farmland,\footnote{See id.} but human population growth and water users have long exceeded the capacity of the Klamath to supply enough water for all of the farmlands, let alone leaving water in the river to sustain the ecosystem.\footnote{See Spain, supra note 403, at 93. The Oregon Water Resources Department still gives out permits in the Klamath Basin even though the Basin has been over-appropriated for years. See id. Irrigators have begun pumping groundwater to fill their demands for water, but groundwater depletion has exacerbated the water conflict in the Klamath. See id. at 94.}
The economic dependence of farmers on irrigation water has led to serious fights over water appropriations in the basin.\textsuperscript{439} In 2001, a severe drought left the Klamath Basin, an already dry region, especially desperate for water.\textsuperscript{440} The Bureau implemented an operations plan for the Klamath Irrigation Project that re-prioritized water deliveries, leaving water in the river for ESA-listed fish and tribal water rights,\textsuperscript{441} but shutting off water deliveries to upper Klamath irrigators—a move that brought the water conflict to a furor.\textsuperscript{442} After losing a lawsuit attempting to enjoin the Bureau from implementing the operations plan,\textsuperscript{443} the Klamath Irrigation District, an organization of irrigators, sued the federal government for $1 billion in lost revenue to farms as a result of the irrigation shut-off.\textsuperscript{444}

Another front in the Klamath water conflict occurred at the convergence of hydropower and irrigation.\textsuperscript{445} Since 1917, a clause in PacifiCorp’s FERC license for the Klamath Hydroelectric Project allowed irrigators to receive electricity for irrigation pumps from the hydroelectric dams at one-twelfth to one-seventeenth the market.

\textsuperscript{439}See Jeff Barnard, \textit{Fight Over Water In Klamath Basin Is Symbol of West}, THE SEATTLE TIMES, Dec. 1, 1996. The drought of the late 1970s was aptly named the “Klamath Salmon War” because of the conflicts between irrigators and the fishing industry and tribes. See McFarlane, supra note 406, at 92.

\textsuperscript{440}See Davidson, supra note 409, at 543–44.

\textsuperscript{441}See McHenry, supra note 409, at 1045–46.

\textsuperscript{442}In 2001, the Klamath water conflict nearly deteriorated into violence when farmers staged a protest to release water from irrigation headgates. See Davidson, supra note 409, at 545. U.S. Marshals were called to Klamath Falls, Oregon, because local police refused to arrest the farmers. See Bruce Barcott, \textit{What’s A River For?} MOTHER JONES May/June 2003.

\textsuperscript{443}See Kandra v. United States, 145 F.Supp.2d 1192, 1198–99 (D. Or. 2001) (denying the irrigators request for an injunction); McHenry, supra note 409, at 1027.


\textsuperscript{445}See Spain, supra note 403, at 113.
In 2006, the states of Oregon and California ordered the decoupling of the favorable rates and a return to market prices phased in over a four- to seven-year transition period. Although an association of Klamath irrigators continues to challenge the states’ decision to decouple, the elimination of below-market power rates removed the principal economic interest irrigators had in maintaining the Klamath’s hydroelectric dams.

3. Tribal Water Rights and the Disappearing Salmon

For almost a century, the interests of hydropower and irrigators took precedence in the Klamath Basin, subjugating tribal and environmental water usage, and at times leaving not even a single drop of water left in the river. In 1864, the Klamath Tribes signed a treaty with the federal government guaranteeing tribal fishing rights in historic fishing grounds of the basin. The Bureau of Reclamation and Oregon’s Water Resources Department, however, paid little attention to the tribes’ reserved fishing rights until 1983, when the Ninth Circuit ruled that the Bureau’s irrigation project must leave enough water in the Klamath to ensure fishing capacity. The Ninth Circuit elevated consideration of tribal water interests above irrigators, concluding that the

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446 See id.
447 See id.
448 See id. at 115–16 discussing Klamath Off Project Water Users Ass’n v. PacifiCorp, 240 P.3d 94, 96 (Or. App. 2010) (dismissing the irrigators’ claims).
449 None of the hydroelectric dams provide water storage for the Klamath Irrigation Project. See Spain, supra note 403, at 113. All of the irrigation diversions occur upstream from the hydroelectric dams.
450 See McFarlane, supra note 406, at 94.
451 See Davidson, supra note 409, at 541.
452 See United States v. Adair, 723 F.2d 1394, 1413–14 (9th Cir. 1983); Spain, supra note 403, at 92–93.
tribes’ water priority date extended to time immemorial, making the tribes’ water right the most senior in the basin.  

Although the Ninth Circuit recognized the tribes’ senior water rights, the historic Klamath water conflict descended into a wicked natural resource problem with the interjection of the Endangered Species Act (ESA). Because the hydroelectric dams blocked migrating fish access to upstream spawning grounds, and irrigators pumped massive amounts of water out of the river and tributaries, the native fish species of the Klamath entered a precipitous decline. In 1988, the Fish and Wildlife Service listed two upstream species, the Lost River and short-nose sucker fishes as endangered species.

The ESA’s requirement that federal agencies consider and protect the listed sucker fishes forced the Bureau to store more water in upper Basin reservoirs, keeping higher upstream water levels and improving sucker fish habitat. But the maintenance of Klamath water upstream, combined with severe droughts in the early 1990s, proved catastrophic for other struggling native species. In 1997, the NMFS listed coho salmon

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453 See Spain, supra note 403, at 93.
454 See Martin Nie, Drivers of Natural Resource-based Political Conflict, 36 POLICY SCIENCES 307, 310 (2003) (describing wicked natural resource problems as exhibiting four characteristics: 1) defining the problem is a problem, 2) having no clear point when the problem is solved, 3) eluding yes/no policy questions to address, and 4) consisting of a pattern where every sub-problem is a symptom of another problem).
455 See Spain, supra note 403, at 52.
457 See Spain, supra note 403, at 56.
458 See id.
as a threatened species, in large part due to the poor water quality and inadequate
downstream Klamath flows that prevented the salmon from migrating upstream to
spawning habitat.\textsuperscript{459} Between September 20 and 27, 2002, over 60,000 fish died in the
lower Klamath due to toxic water conditions and low flows—an event that was one of
the single largest salmon-kills ever.\textsuperscript{460} The loss of wild salmon in the Klamath also
resulted in economic hardship for the California fishing industry, which lost over $100
million in revenue due to fishing closures in 2006 alone.\textsuperscript{461}

In order to fulfill their obligations under the ESA to protect upstream and
downstream fish habitat, the Bureau’s 2001 Operations Plan reprioritized water
deliveries in the basin.\textsuperscript{462} The Operations Plan directed the Bureau to leave enough
water in the Klamath to ensure habitat for upstream sucker fishes and downstream
salmon, and fulfill tribal water and fishing rights before supplying irrigators.\textsuperscript{463} In a
decision cursed by farmers, the federal district court upheld the Operations Plan, noting
that the ESA functioned as a trump card in natural resource management.\textsuperscript{464} According
to the court, the Bureau had a legal duty to leave enough water in the Klamath to avoid

\footnotesize{\textsuperscript{459}See Endangered and Threatened Listing for 16 ESUs of West Coast Salmon, 70 Fed Reg. 37,160 (June 28,
\textsuperscript{460}See Thomas P. Schlosser, Dewatering Trust Responsibility: The New Klamath River Hydroelectric and
Restoration Agreements, 1 WASH. J. OF ENVTL. L. & POL’Y 42, 61 (2011)
\textsuperscript{461}See Spain, supra note 403, at 98.
\textsuperscript{462}See McHenry, supra note 409, at 1045.
\textsuperscript{463}See id.
\textsuperscript{464}See Kandra v. United States, 145 F.Supp.2d 1192, 1207 (D. Or. 2001); Spain, supra note 403, at 58.}
jeopardy to listed species and to fulfill tribal water rights, even if doing so meant causing economic harm to irrigators.\textsuperscript{465}

\textbf{B. Dam Removal and the Klamath Basin Agreements}

The severe decline and subsequent ESA listing of wild fish in the Klamath eventually led to calls from environmentalists, the Klamath Tribes, and the fishing industry to remove the hydroelectric dams and restore the Klamath’s abundant fishery.\textsuperscript{466} The campaign for dam removal accelerated in 2004 when the Klamath Hydroelectric Project’s fifty-year FERC license was set to expire.\textsuperscript{467} By 2010, the major interest groups in the Klamath Basin signed two agreements proposing major changes to water resource management in the basin and aiming to remove PacifiCorp’s four hydroelectric dams by 2020.\textsuperscript{468}

\textit{1. The Relicensing Process}

In 2004, PacifiCorp began the process of renewing its FERC license for the continued operation of the Klamath Hydroelectric Project.\textsuperscript{469} For the next two years, federal agencies studied the environmental and economic effects of relicensing the Klamath dams.\textsuperscript{470} Under the Federal Power Act, the FWS and NMFS submitted joint

\textsuperscript{465}See Kandra, 145 F.Supp.2d at 1207.
\textsuperscript{466}See Allen, supra note 410, at 446.
\textsuperscript{467}See id.
\textsuperscript{468}See id. at 551–52.
\textsuperscript{469}See id. at 446.
\textsuperscript{470}See id. at 447.
comments with mandatory prescriptions for FERC to include in the renewed license.\textsuperscript{471} FWS and NMFS prescribed new fish ladders, fish screens, and improved spillways at all four dams.\textsuperscript{472} The Department of the Interior also submitted comments recommending that FERC require minimum flows from the J.C. Boyle Dam, minimum water levels in the Keno reservoir, and streamflow monitoring throughout the reach of the Klamath Hydroelectric Project.\textsuperscript{473}

In the final EIS released in 2007, FERC concluded that the required modifications and improvements to the hydroelectric dams would cost more than the likely revenue from maintaining the dams, making relicensing the entire Klamath Hydroelectric Project uneconomical.\textsuperscript{474} As a result of this conclusion, and the reluctance of Oregon and California to provide certifications under section 401 of the Clean Water Act without substantial improvements to the Klamath’s water quality,\textsuperscript{475} PacifiCorp turned to the negotiating table, seeking a settlement with key stakeholders.\textsuperscript{476} The resulting

\textsuperscript{471}See id.; 16 U.S.C. § 811 (2006). Recall that under the Federal Power Act, the FWS and NMFS may submit mandatory prescriptions which FERC must include in the license. See Blumm & Nadol, \textit{supra} note 154, at 85.

\textsuperscript{472}PacifiCorp challenged the fishway prescriptions, but an administrative law judge ruled in favor of the FWS and NMFS prescriptions. See In re Klamath, No. 2006-NMFS-0001 at 6 (NOAA Fisheries Sept. 27, 2006).

\textsuperscript{473}See Allen, \textit{supra} note 410, at 449.


\textsuperscript{475}See Allen, \textit{supra} note 410, at 449–50.

\textsuperscript{476}See id.
negotiations produced two major agreements that attempted to settle conflicts of water allocation and hydropower in the Klamath Basin.\footnote{See Schlosser, supra note 460, at 43.}

2. The Agreements

In February 2010, over fifty parties\footnote{See id. at 45. PacifiCorp was not a party to the Restoration Agreement.} signed the Klamath Basin Restoration Agreement—a major proposal to resolve water allocation and fishery issues in the Basin.\footnote{See id.} The Restoration Agreement contained three broad goals for the future of water allocation in the Klamath: 1) restoring and sustaining fish populations to support an economic harvest; 2) providing water and power for agriculture, domestic use, and wildlife; and 3) promoting sustainability, including mitigating effects of future dam removals.\footnote{See Allen, supra note 410, at 453.} The Restoration Agreement called for the creation of the Klamath Basin Coordinating Council, which would oversee $1 billion in federal spending over ten years on water improvement projects, including $900 million for fish restoration.\footnote{See id. at 453–54. The Restoration Agreement requires Congress to approve an additional $400 million appropriation and authorize the federal agencies in the Klamath to redirect $600 million in existing funds over the next 10 years.} Although the Restoration Agreement has been roundly criticized on all fronts,\footnote{See Schlosser, supra note 460, at 43 (criticizing the agreements for their abandonment of tribal fishing and water rights); John Devoe, Merkley’s Proposal Unscientific and Unsustainable, THE OREGONIAN, Dec. 10, 2011 (discussing the views of Waterwatch of Oregon, an environmental group that does not support the agreements because of the costs and the failure of the agreements to protect instream flows for fish).} perhaps the most controversial provision tied that agreement to implementation of the
second agreement, the Klamath Hydroelectric Settlement Agreement. Thus, signatories pinned the fate of a crucial Klamath water allocation agreement on the implementation of the largest dam removal project ever proposed. In 2011, Senator Jeff Merkley (D-Or.) introduced a bill in Congress to approve the Restoration Agreement and authorize appropriations for water improvement projects. But so far, this bill has not gained much political traction, and even Senator Merkley admitted that the debate is going to continue and the issue is far from settled.

During the signing ceremony of the Restoration Agreement in February 2010, twenty organizations consented to the Klamath Hydroelectric Settlement Agreement—a framework for decommissioning the Klamath Hydroelectric Project. Within this novel proposal, PacifiCorp and the federal government agreed to continue studying the possibility of removing the four Klamath hydroelectric dams. If the federal government decides to proceed with dam removal, PacifiCorp will transfer title to the

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483 See Bill Cross, *Harm from Dams Far Outweighs Kilowatts Produced*, THE OREGONIAN, Dec. 3, 2011 (suggesting that the issue of dam removal should be discussed as an economic problem: the value of the electricity generated versus the environmental benefits of dam removal).


488 See id. at 457.
four dams to a designated dam removal entity, which will be responsible for planning and implementing dam removal and river restoration beginning in 2020.

Under the Hydroelectric Agreement, PacifiCorp ratepayers and Oregon and California taxpayers would pay all of the removal costs up to $450 million. In July 2009, Oregon voters approved S.B. 76, a measure that increased rates for Oregon’s PacifiCorp customers in order to raise $185 million by 2020. Subsequently, California’s Public Utility Commission approved a rate increase for northern California PacifiCorp customers in order to raise an additional $15 million for the Klamath dam removal. As part of the Hydroelectric Agreement, the state of California agreed to provide an additional $250 million for removal through bonds. If the costs of dam removal exceed $450 million, the Hydroelectric Agreement releases California, Oregon, and PacifiCorp from further liability, placing the burden of potential excess costs on the federal government or private contributions.

Although the Hydroelectric Agreement established the framework for dam removal, the signatories left the ultimate decision of whether to pursue complete dam removal.

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489 See id. at 459. PacifiCorp would be shielded from liability after the voluntary transfer. Id.
490 See id. at 463. The dam removal entity would be responsible for acquiring the necessary permits and certifications necessary for dam removal.
491 See id.
493 See Allen, supra note 410, at 459.
494 See id. at 460.
495 See id.
496 See id. at 459.
removal in the hands of the Secretary of the Interior. The agreement called for the Secretary to continue studying dam removal and to make a formal determination on whether to move ahead with the plan. After the determination, the project could only proceed if Congress enacted legislation approving the plan, the Secretary and PacifiCorp agreed on a transfer of titles to the dams, the states authorized funding for removal (and the Secretary established a plan to cover excess costs), and the Secretary identified a willing dam removal entity.

With an established timeline for removal beginning in 2020, the Hydroelectric Agreement contemplated the operation of the Klamath Hydroelectric Project during the interim. Currently, the four hydroelectric dams continue to operate under year-to-year FERC licenses. PacifiCorp’s yearly revenues from the Klamath Hydroelectric Project total about $27 million, but the Settlement Agreement requires PacifiCorp to implement temporary measures for improving fish passage and water quality, including spending $510,000 per year on salmon recovery efforts.

C. Factors Affecting Dam Removal: Lessons for the Klamath

Two years after the signing ceremony, the future of the Restoration and Hydroelectric Agreements remains anything but certain. Senator Merkely’s efforts to
approve and appropriate funding for the agreements in Congress have stalled. In February 2012, Secretary Salazar announced that he would delay indefinitely a determination on dam removal because the Department of the Interior lacked authority to take title of the dams and carry out their removal absent congressional action. Despite the novel and ambitious plan to resolve the controversies over dams, water allocation, and ESA-listed species through a holistic approach, the agreements have drawn sharp criticism from both sides—further galvanizing a region accustomed to disagreement. In May 2012, the Hoopa Tribe of the lower Klamath advocated abandoning the agreements and returning the decision of dam removal to FERC through the relicensing process.

The Klamath dams stand at the center of complex web of interest grounds and political conflicts more dense than did the dam removals on the Elwha, White Salmon, Sandy, and Rogue Rivers. But the lessons learned from successful dam removals in other parts of the Pacific Northwest shed some light on the factors affecting dam removal in the Klamath. First, the method of funding the Klamath removals differs

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504 See Learn, supra note 485.
507 See John Bowman, Klamath Dams: Hoopa Tribe files Petition with FERC, SISKIYOU DAILY.COM, Jun. 1, 2012 (the Hoopa might be intending to force dam removal at PacifiCorp’s expense).
drastically from previously successful strategies for decommissioning the Elwha\textsuperscript{508} and Condit Dams.\textsuperscript{509} The Klamath’s Hydroelectric Agreement placed the primary fiscal responsibility for dam removal on the citizens who will benefit most from a restored river ecosystem.\textsuperscript{510} Yet, by placing two state electorates and two public utility bureaucracies in charge of securing $450 million, the Settlement Agreement has created a significant opportunity for dam removal opponents to derail the project at the federal, state, or local levels. Moreover, parties to the Restoration and agreements may have prolonged the process by tying the two agreements together as a packaged deal awaiting approval from Congress.\textsuperscript{511} Congress might have accommodated a dam removal proposal that required no expenditures, but the current political atmosphere is unlikely to acquiesce to the $400 million in additional appropriations contained in the Restoration Agreement. The price tag of the Restoration Agreement and the branding of the Klamath as the “largest dam removal project in history,”\textsuperscript{512} seem to diverge from Congress’s unwillingness to spend federal money.\textsuperscript{513}

Second, community support, or perhaps the lack of community opposition, proved critical to the Elwha,\textsuperscript{514} Sandy,\textsuperscript{515} and Rogue River\textsuperscript{516} dam removals. Pacifying the

\textsuperscript{508}\textit{See supra} notes 101-12 and accompanying text.
\textsuperscript{509}\textit{See supra} note 169 and accompanying text.
\textsuperscript{510}\textit{See Allen, supra} note 410, at 449.
\textsuperscript{511}\textit{See id.} at 451.
\textsuperscript{512}\textit{See Allen, supra} note 410, at 427.
\textsuperscript{514}\textit{See supra} notes 89-100 and accompanying text.
Klamath Basin population and uniting all of the stakeholders around dam removal in the Klamath may be unlikely given the century-old, multi-faceted conflict. The Klamath Agreements attempted to generate a compromise acceptable to most parties; whether this approach will prove successful remains to be seen. Currently, those opposed to dam removal, which include the local congressman. Rep. Greg Walden (R-Or.) as well as some environmental groups opposed to the agreements,\footnote{See supra notes 246-49 and accompanying text.} have effectively blocked congressional approval and any progress toward dam removal.

Third, in each of the previous dam removals in the Pacific Northwest, a champion (a politician, an agency, or an energy company) led the movement to realize dam removal.\footnote{See, e.g., supra notes 299-302 (Savage Rapids), 326-29 (Gold Hill), 345-55 (Gold Ray) and accompanying text.} Perhaps as a symptom of the lack of widespread support for the agreements, the Klamath lacks a champion leading the campaign for dam removal and mustering the political will to see the project to completion.\footnote{See Devoe, supra note 482 (noting that Waterwatch of Oregon, an environmental group, does not support the agreements).} Although public sentiment for dam removal is strong in the Klamath Basin,\footnote{See supra notes 109 (Elwha), 165-67 (White Salmon), 234-43 (Sandy), 385-91 (Rogue) and accompanying text.} the issue is multidimensional, with many competing interests and priorities, and without a steadfast and

\footnote{Editorial, On the Klamath, A Ship Is Sailing, THE OREGONIAN, Dec. 2, 2011 (noting that Rep. Greg Walden, who represents the Klamath Basin, has not fully supported the Agreements because many of his constituents remain opposed to dam removal).}

\footnote{See id.}
capable leader able to garner the required political support from Congress, federal agencies, PacifiCorp, the states, and the local community.

VII. Conclusion

From the successful restoration projects on the Elwha, White Salmon, Sandy, and Rogue Rivers, to the proposed dam removals on the Klamath River, this paper has examined the experiences of dam decommissioning in the Pacific Northwest. Several important factors, such as the size of the project, the applicability of the FERC licensing process, the existence of local opposition and/or political leadership, and the availability and manner of funding affect the speed of the dam removal process from proposal to river restoration. The decades of struggles to remove dams in the Pacific Northwest should provide valuable lessons for other parts of the country and the world hoping to follow in the Northwest’s footsteps in search of renewed ecosystems and restored rivers.521

The physical and human geography of the Pacific Northwest, including a history of massive hydroelectric projects that depleted once-abundant salmon fisheries,522 provided the region’s impetus for removing dams. Restoring fisheries also provides a significant motivation for removing dams in the Snake River Basin of Idaho and Eastern

521 The movement to remove dams has an international component, including in Sweden. See Anna G.C. Lejon et al., Conflicts Associated With Dam Removal in Sweden, 14 ECOLOGY & SOC’Y 4, 5 (2009).
Washington.\textsuperscript{523} Since the 1980s, river restoration advocates have called for the removal of four Snake River hydroelectric dams that block salmon migration to thousands of miles of headwaters spawning grounds.\textsuperscript{524} In May 2012, leaders of the Nez Perce Tribe in Idaho renewed their calls for the federal government to rethink their failed policies concerning the lower Snake River dams.\textsuperscript{525} Other current dam removal proposals include the Green River in Massachusetts\textsuperscript{526} and the Ventura River in California.\textsuperscript{527} In the future, dam removal proposals are likely to accelerate.\textsuperscript{528} As the Harvard Law Review recently observed, “[t]he Columbia River conflict is only the most high-profile manifestation of a growing unease about the environmental and economic costs of dams; 241 dams were demolished nationwide between 2006 and 2010.”\textsuperscript{529}


future proposals for dam removal throughout the country stand to benefit from the lessons of the Pacific Northwest.

The size of the dam and the amount of required restoration work are major factors affecting the outcome of dam removal. Small-scale dams on the Rogue River, the Gold Hill530 and Gold Ray Dams,531 stood less than thirty-eight feet tall and were easily removed within a few years of the initial proposal.532 On the other hand, the Elwha and Glines Canyon Dams each stood more than 105 feet tall and created large reservoirs that will require years of reclamation and deconstruction work to restore the river channel.533 For more than two decades, the Elwha River dams’ size, complexity, and symbolism represented a daunting task for both engineers and politicians, delaying the dam’s eventual removal.534 As of 2012, the Elwha dam removals hold the record for largest U.S. dam removal project in history535—a record that many citizens and groups in the Klamath Basin hope to usurp.

The FERC licensing process for non-federal hydroelectric dams presents either an opportunity for clarity or a cloud of uncertainty, but exerts a considerable influence over the dam removal result. The Elwha, White Salmon, and Sandy River dams all

530See supra notes 317-36 and accompanying text.
531See supra notes 337-57 and accompanying text.
532See supra notes 336 (Gold Hill) and 356 (Gold Ray) and accompanying text.
533See supra notes 41-44 and accompanying text.
534See supra notes 73-127 and accompanying text.
began the process of dam removal because of the mandatory prescriptions for fish passage imposed by federal agencies under the Federal Power Act. In the case of the Condit Dam, PacifiCorp attempted to surrender its FERC license during the renewal application, causing confusion at FERC, which had procedures for license renewal or license surrender, but not both at the same time. PGE decided from the outset to voluntarily surrender its FERC license for the Bull Run Hydroelectric Project, and the James River Corporation avoided the FERC process by transferring ownership of the Elwha and Glines Canyon Dams to the federal government.

Local opposition to dam removal in the Pacific Northwest has proven to be one of the most telling factors determining how much time passes between initial proposal and completion of the project. Steadfast political opposition, as demonstrated by Senator Gorton’s refusal to support the Elwha dam restoration, can obstruct the necessary congressional approval and delay the project for years. In contrast, the remoteness and federal ownership of the land surrounding the Sandy River dams meant that the dam removal affected few local landowners, and thus the project proceeded without significant opposition. On the other hand, Congressman Walden’s opposition to not completing the Elk Creek dam was not sufficient to prevent the

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536 See supra notes 67-71 (Elwha), 154-67 (White Salmon), 232-36 (Sandy) and accompanying text.
537 See supra notes 171-72, 250-52 and accompanying text.
538 See supra notes 235-37 and accompanying text.
539 See supra notes 97-100 and accompanying text.
540 See supra notes 105-06 and accompanying text.
541 See supra note 249 and accompanying text.
notching of the dam, presumably because of the mounting opposition of federal agencies and the expense of completing the project.542 Advocates for removing the Klamath River dams have the most to learn from the Condit Dam removal, where local landowners delayed the state and county permitting process, and even attempted to use environmental laws to derail the project.543 A controversy as complex as the Klamath’s will not likely yield to unanimous agreement overnight, but persistent and coordinated efforts by federal agencies, tribes, environmentalists, and the dam owners can eventually overcome even well-funded opposition. Whether this opposition will continue to include Congressman Walden remains to be seen.

Successful dam removals in the Pacific Northwest all exhibit the presence of at least one strong political champion to provide leadership and influence throughout the dam removal process. Congressmen John Dingell and Norm Dicks and Senator Bill Bradley paved the way for Congress to approve the Elwha Act and fund the Elwha dam removals,544 and the National Park Service fulfilled a leadership role in planning, permitting, and conducting the restoration.545 The Yakama tribe and environmental groups successfully campaigned to remove the Condit Dam by forcing a final settlement agreement with PacifiCorp.546 On the Sandy River, the dam owners, PGE, assumed a leadership role after perceiving an economic and public relations gain

542 See supra 381-84 and accompanying text.
543 See supra notes 176-84 and accompanying text.
544 See supra notes 107-12 and accompanying text.
545 See supra notes 159-67 and accompanying text.
546 See supra notes 161, 168-72 and accompanying text.
through the speedy restoration of an immensely popular wild fishery.\textsuperscript{547} Similarly, environmental groups and federal agencies led the way for the Rogue River dam removals.\textsuperscript{548} But, the Klamath Basin currently lacks an outspoken political champion.\textsuperscript{549}

Finally, dam removals in the Pacific Northwest demonstrate that the sources and amounts of funding determine whether a proposal for dam decommissioning will proceed quickly or experience delay. Congressman Norman Dicks and others secured funding for the Elwha dam removals in stages, allowing each appropriation to contribute small amounts that added up to full funding over the course of a decade.\textsuperscript{550} The Elwha and Rogue dam removals both benefited from the 2009 stimulus bill, the American Recovery and Reinvestment Act, because they each had “shovel ready” plans in place.\textsuperscript{551} Private funding from the dam owners financed the Condit\textsuperscript{552} and Sandy River\textsuperscript{553} dam removals, although, in Condit, PacifiCorp operated the profitable dam for six years more than called for by the settlement agreement accumulating sufficient funds from power sales to pay for the $17 million restoration project.\textsuperscript{554}

\textsuperscript{547} See supra notes 234-43 and accompanying text.  
\textsuperscript{548} See supra notes 294, 327, 367 and accompanying text.  
\textsuperscript{549} See supra note 518 and accompanying text.  
\textsuperscript{550} See supra notes 108-12 and accompanying text.  
\textsuperscript{552} See supra note 169 and accompanying text.  
\textsuperscript{553} See supra notes 244-45 and accompanying text.  
\textsuperscript{554} See supra note 169 and accompanying text.
The projected costs for the Klamath River dam removals dwarf the final bills from the Elwha, White Salmon, Sandy, and Rogue Rivers, especially because the interest groups tied the dam removal proposal to the water allocation agreement, which demands an additional $400 million appropriation from Congress. Advocates for the Klamath restoration and other future dam removal proposals might consider the example of the Elwha dam removals by breaking the appropriations into smaller, more politically palatable amounts. Although spreading the appropriations out into smaller increments extends the timeline for the project, a persistent and measured approach may be the best option for funding larger-scale dam removals in an era of fiscally strapped government budgets.

555 See supra notes 110 and accompanying text (Elwha dam removals cost between $246 and 272 million).
556 See supra note 169 and accompanying text (Condit Dam removal costs capped at $17.15 million).
557 See supra notes 244-45 and accompanying text (the Sandy River dam removal cost about $22 million).
558 See supra notes 310 (Savage Rapids cost about $28 million), 332 (Gold Hill cost about $4 million), 347, 350 (Gold Ray cost about $5 million) and accompanying text. Total costs for notching the Elk Creek Dam are unknown, but not likely to be significantly more than the removals at Gold Hill or Gold Ray.
559 See supra 481.
560 See supra notes 108-12 and accompanying text.