Comments

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Fighting an Upstream Battle: Fish Recovery in the Federal Columbia River Power System

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INTRODUCTION

To the passing traveler, the small town of Stanley, Idaho, quickly disappears in the rearview mirror, along with the jagged, snowcapped skyline of the Sawtooth Mountains. Nestled deep in the peaks and valleys of that backdrop, the Salmon River rushes on. As the river runs and leaps from its origin in the mountains down to Stanley, a small tributary creek connects to the mouth of Redfish Lake a thousand feet above. This lake has been a witness to the beginning and end of one of the most impressive life cycles of any animal on earth—that of the sockeye salmon. For millennia, these natal waters have seen the birth of these hardy fish at some of the farthest reaches of the Columbia River Basin, the interconnected watersheds that drain into the Columbia River.

The juvenile salmon inhabit the alpine lake until they are strong enough to begin an incredible journey, leaving their calm home waters for the downstream current of Redfish Lake Creek. They will follow the meandering creek to the Salmon River, a long ribbon of oxygenated riffles and bends, joining the Snake River just north of Hells Canyon on the Oregon-Idaho border. The Snake River arcs to the northwest before finally turning south at its confluence with the Columbia River. A mere pit stop, the surviving young salmon must navigate the entire lower Columbia River west across the Oregon-Washington border before they arrive in the Pacific Ocean. They will call the ocean home for years before they gain the strength to make an epic return to their home waters. The fish then face every obstacle imaginable: waterfalls, fishing boats, downed trees, and predators of all shapes and sizes. Those fish from the Sawtooth Mountains who complete the journey will have climbed over 6,500 feet in elevation by the time they reach the Redfish Lake Creek again to spawn the next generation of sockeye salmon. This is the life cycle of an anadromous fish—a creature that begins its life in freshwater and swims to the ocean, only to return and die an exhausted death at the spawning grounds in which it was born. These fish are the heroes in the odyssey of the Columbia River Basin.

Historically, Idaho sockeye salmon runs are estimated to have numbered 100,000 in the preindustrial Snake River basin.[1] Indigenous

[1] Brad Smith, *Idaho Salmon and Steelhead by the Numbers*, IDAHO CONSERVATION LEAGUE (Mar. 19, 2019), https://www.idahoconservation.org/blog/idaho-salmon-and-steelhead-by-the-numbers/ [https://perma.cc/4BH2-8SGE].

tribes such as the Shoshone and Nez Perce relied heavily upon the salmon for sustenance, as well as for spiritual and cultural practices.[2] As the United States government turned its eye to the west for territorial expansion and settlement, native tribes were still able to harvest an estimated forty-one million pounds of fish annually across the Columbia-Snake basin, all while maintaining sufficient populations for the following years.[3] In 1992, however, only one fish returned to Redfish Lake.[4] These dwindling returns prompted the Endangered Species Act listing of Idaho's once bountiful sockeye salmon population in 1991.[5] It is not the mileage, nor the steep elevation, nor intense predation that causes this plummet in return numbers, for salmon had historically overcome these natural barriers. A new set of impasses threaten the existence of these fish. A carefully engineered network of thirty-one hydroelectric dams provide flood control, water supply, and clean energy benefits to the Pacific Northwest, and have become a staple of the regional energy infrastructure over the last century.[6] However, these formidable obstacles alter the water quality, temperature, and navigability of the lower Columbia River, lower Snake River, and their once free-flowing tributaries, threatening the survival of thirteen listed fish species.[7] As a result, some scientists are bracing for the extinction of certain Evolutionarily Significant Units (ESUs) of anadromous fish species within a decade.[8] Such grim forecasts for the listed salmon and steelhead ESUs in the Columbia River Basin further underscore the urgent need of systemic change to fish population recovery efforts needed to save an irreplaceable piece of the natural and cultural heritage of the Pacific Northwest.

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2 PAT FORD, SALMON IN IDAHO: HISTORY, ECOLOGY, PUBLIC LANDS, AND THE BONDS BETWEEN PEOPLE AND SALMON 3–4 (Oct. 2017).

3 *Id.* at 3.

4 *Sockeye Salmon*, IDAHO FISH & GAME, https://idfg.idaho.gov/conservation/sockeye [https://perma.cc/WN2M-WW7C].

5 *Id.*

6 NW. POWER & CONSERVATION COUNCIL, A BRIEF HISTORY OF THE FEDERAL COLUMBIA RIVER POWER SYSTEM AND POWER PLANNING IN THE NORTHWEST 2 (2011).

7 *See* Bob Berwyn, *Global Warming Is Pushing Pacific Salmon to the Brink, Federal Scientists Warn*, INSIDE CLIMATE NEWS (July 29, 2019), https://insideclimatenews.org/news/29072019/pacific-salmon-climate-change-threat-endangered-columbia-river-california-idaho-oregon-study/#:~:text=Pacific%20salmon%20that%20spawn%20in,warn%20in%20a%20new%20study [https://perma.cc/CLK2-VETG]; *Federal Columbia River Power System Biological Opinion*, NOAA FISHERIES, https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/federal-columbia-river-power-system-biological-opinion [https://perma.cc/7ZCJ-L557].

8 *See* Berwyn, *supra* note 7.

Not only does the physical hydroelectric system imperil anadromous fish, but it also places the fish in the crossfire of a tense legal and political conflict. Two somewhat contradicting obligations in the Northwest Electric Power Planning and Conservation Act (Northwest Power Act) mandate federal agencies to first provide consistent hydroelectricity to the region and, second, to implement a fish management plan to recover populations adversely affected by fourteen of the thirty-one dams that make up the Federal Columbia River Power System (FCRPS).[9] While each directive reflects strong regional priorities, the goal of a carbon-free energy supply is paramount; legal language reflects this dynamic, dictating fish recovery actions may occur "while assuring . . . an adequate, efficient, economical[,] and reliable power supply" through the hydropower system.[10] Under this scheme, fish appear to come in a close second place to the system that threatens their existence. This apparent mismatch begs an existential question: why should Pacific Northwest energy users and taxpayers be forced to participate in a power system that allows the same federal agencies to administer seemingly untenable aims?

The primary intent of the Northwest Power Act was not to delegate contradicting roles to the agencies operating within the Columbia River Basin, but when viewing the hydropower system through a fish recovery lens, this tension cannot be ignored. Given the grim outlook for native fish in the Columbia River Basin, greater flexibility is necessary, and it is feasible, whether by altering the existing infrastructure or taking a more radical approach by removing some of the infrastructure entirely. If the region must rely upon a power system that will inherently continue to harm fish, little room for genuine progress exists. At best, threatened and endangered fish are barely being kept from extinction, and at worst, the trend toward extinction is simply being delayed.[11] Accordingly, the fish recovery efforts in the Columbia River Basin have not sufficiently reckoned with this double bind and will continue to fall short until the conflicting aims of hydropower and fish recovery are confronted in new ways.

To unravel the complexity that is the Columbia River Basin and all its laws, both anthropogenic and ecological, would be too complicated for a single article. In metaphorical terms, if the conflict between

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9 Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. § 839(2), (6).

10 § 839b(h)(5).

11 *See Extinction*, NW. POWER & CONSERVATION COUNCIL, https://www.nwcouncil.org/reports/columbia-river-history/extinction [https://perma.cc/9LMW-MKV2].

hydropower and fish were likened to a river, perhaps the scope of this Comment would be represented by a single salmon or steelhead. Challenges in the Columbia River Basin, like these fish, are often difficult to pinpoint, slippery, and put up great resistance to being subdued. To continue in this metaphorical ecosystem, the way I aim to connect with the evasive fish is through the meticulous exercise of fly fishing. A fly angler catches fish not by throwing a net across an entire stream but rather by casting a single fly from a flexible rod. The fly itself is a hook carefully wound in certain materials and patterns to resemble insects like mayflies and caddisflies, which make up the salmon's diet. Anglers tend to collect many flies over time and choose the right setup based on their location, weather, and the available diet of the fish, among other things. A well-presented fly that drifts just the right way through the current can allow the angler to connect with the otherwise elusive predators. But the only way to do this reliably is to understand the entire ecosystem—the insects, the water, the fish species, and so on. It is therefore my intention as both an angler and a writer to present the following "flies" from my tackle box to target select legal and policy challenges in the Columbia River Basin.

Part I of this Comment addresses the legal obligations of the major actors in the FCRPS and explores how these participating federal agencies play their own unique roles in the regional efforts for fish recovery. This section also compares and contrasts key goals and obligations of federal actors with those of the Columbia River Basin Fish and Wildlife Program. This section concludes with a discussion of the various legal obligations that have led fish recovery efforts to where they are today. Part II analyzes systemic deficiencies in fish recovery efforts within the FCRPS, focusing on the most threatening challenges within the physical infrastructure of the hydropower system. This section also analyzes the systemic mismatch in law and policy that results from the differing obligations of the action agencies. Part III discusses flexible spill operations, cooperative developments following litigation, and ways in which these solutions have fallen short to date. Finally, Part IV turns to the most aspirational solution capable of addressing climate change, fish recovery, and economic stimulus: removal of the four lower Snake River dams.

I
ROLES AND OBLIGATIONS OF FEDERAL ACTORS IN THE COLUMBIA RIVER BASIN

A. Action Agencies: Law and Policy Obligations

The Pacific Northwest boasts some of the cleanest energy in the nation.[12] On balance, hydroelectric generation emits virtually no carbon, is readily dispatchable, and has been engineered to allow near-total control over an otherwise unbridled natural resource.[13] With the passage of the Bonneville Project Act in 1937, the region first realized its potential for an advanced hydroelectric energy scheme.[14] Born from this legislation was the Bonneville Power Administration (Bonneville), whose role includes selling wholesale electricity from the dams and acting as the regional power marketer.[15] These massive infrastructure projects allow for important societal benefits but at the same time are replete with problems for the ecosystems they disrupt, particularly anadromous fish habitat. The construction and operation of the FCRPS dams comes with costs to habitat accessibility, water quality, and the hydrology of streams and impoundments.[16] Eventually, federal policy began to reflect the need for change in response to the great survival pressure imposed on salmon and steelhead populations.

On December 5, 1980, Congress set in motion the Pacific Northwest Electric Power Planning and Conservation Act.[17] Through the Northwest Power Act, Congress put forth a two-pronged approach to accomplish its goals. First, the Act requires a plan to meet energy demands for the region.[18] Second, the Act requires a plan for the protection, mitigation, and enhancement of fish populations.[19] To administer these dual aims, the Act mandates the establishment of the Northwest Power and Conservation Council (the Council).[20] The

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12 *See* NW. POWER & CONSERVATION COUNCIL, SEVENTH NORTHWEST CONSERVATION AND ELECTRIC POWER PLAN 1-1, 1-12 (Feb. 25, 2016) [hereinafter NORTHWEST POWER PLAN].

13 *Id.* at 1-12 to 1-13.

14 *See* Bonneville Project Act, 16 U.S.C. § 832.

15 Federal Power Act, 16 U.S.C. § 796(19).

16 NW. POWER & CONSERVATION COUNCIL, SEVENTH NORTHWEST POWER PLAN APPENDIX I: ENVIRONMENTAL EFFECTS OF ELECTRIC POWER PRODUCTION I-8 to I-10 (2016) [hereinafter NORTHWEST POWER PLAN APPENDIX I].

17 *See* 16 U.S.C. § 839.

18 § 839(2).

19 § 839(6) (using protection, mitigation, and enhancement to describe fish recovery goals for action agencies subject to the statute).

20 § 839b(a)(2)(A).

Council consists of members appointed by the governors of each state in the Columbia River Basin: Idaho, Montana, Oregon, and Washington.[21] As the designated body for the creation of management schemes for the two central tasks in the Northwest Power Act, the Council drafts and publishes the Northwest Power Conservation and Electric Power Plan (Northwest Power Plan) every five years to meet this requirement.[22] The Council is currently operating under the Seventh Power Plan, which was published in 2016.[23] Additionally, the Council relies on other key stakeholders to carry out the obligations of the plan. As the title suggests, much of the plan directly addresses regional energy planning. Highlights of this plan include the implementation of current energy resource strategies, electricity demand and price forecasts, new energy resource potential, and cost-benefit analyses of alternative strategies.[24]

In addition to these components, the Northwest Power Plan serves as a vehicle to incorporate the Columbia River Basin Fish and Wildlife Program, a distinct component of the plan, satisfying the second prong of the Northwest Power Act.[25] Authored by the Council, the Fish and Wildlife Program focuses directly on protecting, mitigating, and enhancing salmon and steelhead populations, as the Act requires.[26] The current Fish and Wildlife Program, published in 2014, defines "recovery" as "[t]he re-establishment of a threatened or endangered species to a self-sustaining level in its natural ecosystem to the point where the protective measures of the Endangered Species Act are no longer necessary."[27] Re-establishment, distinct from establishment, is an important word choice. It underscores the fact that this program would not be necessary *but for* the cumulative effects of the hydropower system. Expanding upon this definition of recovery, the "Goals and Objectives" section of the program more explicitly states that the program itself is a response to the adverse effects of the construction and operation of hydroelectric dams on the ecosystem.[28]

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21 § 839b(a)(2)(B).

22 § 839b(d)(1).

23 *See* NORTHWEST POWER PLAN, *supra* note 12.

24 *Id.*

25 *Id.* at 20-1.

26 NW. POWER & CONSERVATION COUNCIL, COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM 2 (Oct. 2014) [hereinafter FISH AND WILDLIFE PROGRAM].

27 *Id.* at 138.

28 *See id.* at 29–36.

Keeping this causal relationship in mind is critical when analyzing the legal framework of responsibilities for fish recovery.

Currently, thirty-one federal dams supply the Pacific Northwest with over 40% of the region's electricity.[29] The Army Corps of Engineers (the Corps) and the Bureau of Reclamation (BOR) actually own the dams themselves and meticulously control day-to-day flows and the operation of the hydroelectric generation.[30] Historically, the Corps's dams were built primarily for navigation purposes, whereas the BOR dams were built for irrigation.[31] Working alongside these agencies is Bonneville, a power marketing agency selling wholesale electricity from the dams to regional utility customers.[32] Each with their own respective authorities, the Corps, the BOR, and Bonneville are collectively the "action agencies" in the FCRPS, a designation that reflects particular obligations under federal law.[33] Each of these entities plays a unique role in the FCRPS, and each accordingly takes on different responsibilities to satisfy their individual obligations and shared objectives.

Bonneville's role as a power marketer squarely addresses the first prong of the Northwest Power Act—ensuring adequate, efficient, economical, and reliable power supply for the Pacific Northwest.[34] The revenue from these operations links Bonneville directly to the fish recovery efforts. Bonneville's funding is critical for a functional Power Plan, as well as for the implementation of fish recovery programs, as its revenue from energy generation activities amounts to billions of dollars annually.[35] The agency is required to dispose of these funds by supporting the implementation of recovery projects managed by other entities within the FCRPS.[36] As such, Bonneville functions as a financier for many recovery projects on the local, regional, tribal, state, and federal level.[37]

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29 *Id.* at 133; NORTHWEST POWER PLAN, *supra* note 12, at 9-5. The scope of this Comment is primarily concerned with the first four dams upstream from the mouth of the Columbia River and the next four dams on the lower Snake River.

30 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 128.

31 DAVID P. BILLINGTON ET AL., THE HISTORY OF LARGE FEDERAL DAMS 89 (2005).

32 16 U.S.C. § 832d(a).

33 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 2.

34 16 U.S.C. § 839(2).

35 *See* BONNEVILLE POWER ADMIN., SUSTAINING SUCCESS: ANNUAL REPORT 2019, at 12 (Nov. 2019).

36 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 15, 48.

37 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 118.

B. Federal Consultation Under the Endangered Species Act

Despite the regional nuance of fish recovery programs and policies in the Columbia River Basin, federal law reigns supreme when determining the acceptable threshold of an action agency's impacts on fish. Particularly, Section 7 of the Endangered Species Act (ESA), titled "Interagency Cooperation," applies to federal actions that may affect a listed species. Such actions could feasibly be changes to the hydropower system, like changes to water flow over the gates of the dam, known as "spill," or physical construction projects. When an action agency proposes such actions, Section 7 of the ESA provides a consultation process to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat . . . ."[38]

In the FCRPS, the National Oceanic and Atmospheric Administration (NOAA)—more specifically, the National Marine Fisheries Service (NMFS)—acts as the consulting agency for the action agencies.[39] The consulting agency must consider impacts on all salmon and steelhead ESUs throughout the consultation process.[40] This process ultimately produces a biological opinion (BiOp), which contains a finding of whether the proposed federal actions will likely jeopardize the existence of listed species or result in the adverse modification or destruction of the species' habitats.[41] This particular conclusion is referred to as the jeopardy finding. Most commonly, a BiOp will not find such a heightened level of risk, resulting in a "no-jeopardy" opinion. The agency action need not take any measures to improve the status of species or enhance its growth in order to avoid violation of Section 7.[42] Rather, Section 7(a)(2) of the ESA is violated "only where the action causes reductions to the species' 'reproduction, numbers, or distribution' to the degree of reducing appreciably the species' likelihood of survival and recovery in the wild."[43] This means that due to the legal definitions of "jeopardy," "destruction," and

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38 Endangered Species Act, 16 U.S.C. § 1536(a)(2) (2018).

39 16 U.S.C. § 839(b)(h)(11)(B). "NOAA Fisheries" and "NMFS" are used interchangeably in official publications.

40 16 U.S.C. § 1536(b)(4)(C).

41 NAT'L MARINE FISHERIES SERV., 2019 COLUMBIA RIVER SYSTEM BIOLOGICAL OPINION 24 (Oct. 2, 2019) [hereinafter 2019 BiOp].

42 *Id.* at 27.

43 *Id.*

"adverse modification," an action agency's proposed action could feasibly cause considerable damage to a listed species without triggering a consulting agency's jeopardy finding.[44]

An agency action that "jeopardize[s] the continued existence of a listed species" is an action that "would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."[45] Additionally, "destruction or adverse modification" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species."[46] Together, these definitions require NMFS as the consulting agency to consider the effects of federal actions on survival and recovery, but in no way require a guarantee of species survival or recovery.[47]

Because agency actions, such as structural changes to a hydroelectric system, are often costly and complex, the outcome of a BiOp and whether it is challenged can cause considerable obstacles in the implementation of changes across the FCRPS as a whole. If a proposed agency action is initiated without undergoing consultation, the action agency may be vulnerable to an enforcement action under Section 7. Even when consultation does occur, much scrutiny is given to the resulting BiOp. Since the first salmon populations were listed under the ESA in 1991, nearly every single BiOp has been challenged in federal court for inadequate operations and maintenance plans and insufficient conservation measures.[48]

Dominated by tangled webs of interagency relationships and no shortage of acronyms, even a distilled version of the governing law and policy concerning hydropower and fish recovery in the Columbia River Basin is lengthy. Regional fish recovery obligations reside in many places, each with a slightly different focus. Under this framework, the Columbia River Basin Fish and Wildlife Program is effectively the cumulative result of the Northwest Power Act, the Northwest Power Plan, and the action agencies' combined obligations. Paired with the

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44 *Id.* at 34.

45 *Id.* at 28.

46 *Id.*

47 *Id.* at 34.

48 BONNEVILLE POWER ADMIN., ESA SECTION 7(A)(2) INITIATION OF FORMAL CONSULTATION FOR THE OPERATIONS AND MAINTENANCE OF THE COLUMBIA RIVER SYSTEM ON NOAA FISHERIES LISTED SPECIES AND DESIGNATED CRITICAL HABITAT 9 (Nov. 2, 2018).

requirements of the ESA's consultation process for federal actions, a NMFS BiOp is created. The body of law, policy, funding, and physical infrastructure of the Columbia River Basin Fish and Wildlife Program is the largest fish recovery program in the world.[49] Perhaps this should be understood as a sobering admission rather than a proud announcement of administrative might, given that the need for fish recovery programs stems directly from the anthropogenic harms of the power system.[50]

II
SYSTEMIC DEFICIENCIES IN FISH RECOVERY EFFORTS

Regional commercial records and indigenous historical records indicate that over ten million salmon and steelhead may have returned to the mouth of the Columbia River annually prior to 1850—the approximate turning point of industrial development, European settlement, and exploitation of natural resources in the Pacific Northwest.[51] However, the return numbers since 1938 have only recently exceeded one million by the time migrating fish reach Bonneville Dam, the first of eight federal dams on the Columbia River and lower Snake River, upon their return from the Pacific Ocean.[52] Certain ESUs of salmon, such as the sockeye salmon population of the Sawtooth Basin in Idaho, have even worse vital signs. Several years of salmon counts in the late 1980s and 1990s totaled fewer than two dozen, including the exceptional return of a single fish in 1992, aptly named Lonesome Larry by the Idaho Fish and Game.[53] The impacts of four federal dams on the lower Snake River, built from 1961 to 1975, are demonstrated by a declining survival rate trend during and after this time, where fish have still not rebounded to prior population levels.[54]

In light of these troubling metrics, established targets of five million adult salmon and steelhead returning to the mouth of the Columbia

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49 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 2.

50 16 U.S.C. § 839b(h)(10)(A).

51 *Salmon and Steelhead*, NW. POWER & CONSERVATION COUNCIL, https://www.nwcouncil.org/reports/columbia-river-history/salmonandsteelhead [https://perma.cc/G55J-J96R].

52 John Harrison, *2013: A Record Year for Fall Chinook*, NW. POWER & CONSERVATION COUNCIL (Sept. 27, 2013), https://www.nwcouncil.org/news/2013-record-year-fall-chinook [https://perma.cc/HBE7-5EMT].

53 *See* IDAHO CONSERVATION LEAGUE, *supra* note 1.

54 *Id.*

River by 2025 appear lofty.[55] The paradox here is that even if achieved, this ambitious goal still concedes up to half of the historic population levels as a result of the FCRPS operations and variable ocean conditions caused by climate change.[56] Setting the optimal recovery goal at the halfway point has effectively "curved the grade" of recovery, skewing an otherwise failing score of fifty percent to be the new "A." Understanding the trajectory toward fish recovery with respect to current challenges will shed light on which programmatic areas lack the requisite strength to achieve recovery goals, however ambitious, inadequate, or both. Accordingly, this section will focus on two key themes: threats to salmon and steelhead from the physical infrastructure of the FCRPS and an analysis of specific legal and policy issues relating primarily to the NMFS BiOp and Bonneville's funding allocation.

Symptoms of damming a river include slowing the river's current and raising its water temperatures, sometimes to a lethal degree for the fish within the stream.[57] Dams cause and worsen challenges associated with stream accessibility, increase susceptibility to predation, intensify competition between wild fish and artificially introduced fish, and exacerbate poor water conditions, leaving salmon and steelhead more vulnerable at each successive dam in the system.[58] With the added challenges of commercial and recreational fishing pressure on anadromous fish populations, the Columbia River's endangered ESUs are in a precarious position. Overall, these major threats to salmon are collectively called the "four Hs"—habitat, harvest, hatchery, and of course, hydropower.[59] The hydropower harm, in particular, is uniquely suited to exacerbate the symptoms and harms that result from the other Hs. Dam operations must therefore strategically consider indirect and direct harm to fish populations. Operations have recently included fish transport programs and spill operations to satisfy systemwide fish recovery obligations and to combat some of the inherent harms of dams.[60]

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55 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 29.

56 *Id.* at 70.

57 NORTHWEST POWER PLAN APPENDIX I, *supra* note 16, at I-8 to I-10.

58 *See* FISH AND WILDLIFE PROGRAM, *supra* note 26, at 46, 153–55.

59 Michael C. Blumm & Melissa Powers, *Avoiding Dam Breaching Through Offsite Mitigation: NMFS's 2000 Biological Opinion on Columbia Basin Hydroelectric Operations*, 32 ENV'T. L. 241, 254 (2002).

60 *Federal Columbia River Power System Biological Opinion*, NOAA FISHERIES (Sept. 7, 2021), https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/federal-columbia-river-power-system-biological-opinion [https://perma.cc/Q4CW-DVAT].

An anadromous fish that completes its natural life cycle must pass through each dam below its spawning grounds twice—first as a juvenile passing downstream and second as an adult migrating upstream to its spawning grounds.[61] Juvenile fish can pass through the many dams in several ways when swimming downstream, each of which presents a different likelihood of survival. Some dams allow water to pass through with conventional spill gates, where an opening deep below the surface forces fish to dive deeper to find the passage.[62] An improvement to this is a raised weir, a physical obstruction in front of the spillway gate that draws water toward the surface, raising the elevation of flow, and making the entrance easier to locate.[63] A case study from 2012 revealed that while conventional spillways at the Little Goose dam were the selected route for 21% of young chinook salmon, yielding a 95% survival rate, a 100% survival rate was observed in the 44% of fish that chose to swim through the raised weir.[64]

Even relatively simple infrastructure improvements have the capacity to effect significant change. The challenging counterpoint to improvements like surface weirs is that salmon and steelhead swimming seaward from the farthest accessible reaches of the Snake River, for example, do not swim through just one dam but rather eight, each with different passage features. Fish may also make different choices while passing through each obstacle or make no decision at all, if the current carries them in one direction through a dam. Where the path of least resistance is not the most protective type of passage, survival rates may then decline. For example, if the entrance to the turbine is most accessible, fish may inadvertently enter the turbine more often than a safer path. The hydroelectric turbines across the FCRPS are responsible for killing 10%–15% of fish drawn into their pits, due to either the impact of the spinning blades or the intense pressure differential they create.[65] The result may be delayed mortality,

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61 *Dams on the West Coast*, NOAA FISHERIES (July 20, 2020), https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/dams-west-coast [https://perma.cc/6HSM-8LJK].

62 BONNEVILLE POWER ADMIN., CITIZEN'S GUIDE TO THE 2016 COMPREHENSIVE EVALUATION 6 (2016), https://www.bpa.gov/news/pubs/GeneralPublications/fish-Citizens-Guide-to-the-2016-Comprehensive-Evaluation.pdf [https://perma.cc/U9NS-T33P] [hereinafter CITIZEN'S GUIDE].

63 *Id.*

64 *Id.*

65 *Dams: Impacts on Salmon and Steelhead*, NW. POWER & CONSERVATION COUNCIL, https://www.nwcouncil.org/reports/columbia-river-history/damsimpacts [https://perma.cc/Q7UR-67G3] [hereinafter *Dams: Impacts*].

a fish death that occurs much later as a result of injuries sustained from the earlier trauma, or immediate death.

Transportation of juvenile fish to avoid the dams entirely has been one long-employed method of mortality mitigation during downstream passage.[66] Trap-and-haul transportation consists of a physical obstruction near the exit point of the dam, which leads to a holding tank where fish are trapped and transported downriver below the dam via truck or barge.[67] This comes with its own costs as well. In a 2015 update to an extensive 2014 report by NMFS, it was found that transportation of juvenile fish may negatively affect the survival rates of adults in later migration.[68] Transportation was found to be a main predictor of survival in the Columbia River, whereas environmental conditions, such as cumulative temperature during fish migration, were stronger factors for predicting survival in the Snake River.[69]

For downstream passage as a whole within the Columbia River and lower Snake River, the NMFS BiOp sets performance standards at 93% survival for summer migration and 96% for spring migration.[70] While wild and hatchery-raised chinook and steelhead, for example, appeared to trend toward these targets from 1997–2013, a steady decline in survival rates beginning in 2014 thwarted progress.[71] Overall, the Fish and Wildlife Program aims for annual salmon and steelhead runs of five million—a herculean figure compared to current fish returns, which do not come close. Achieving this lofty goal will require meeting qualitative targets with a carefully coordinated effort from multiple parties, the likes of which has yet to be seen.[72] The most recent High Level Indicators report, published in 2018, shows the highest fish count

66 *Fish Passage at Dams*, NW. POWER & CONSERVATION COUNCIL, https://www.nwcouncil.org/reports/columbia-river-history/fishpassage [https://perma.cc/97MY-BZG6].

67 *Federal Columbia River Power System Juvenile Transport Program*, NOAA FISHERIES (Sept. 27, 2019), https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/federal-columbia-river-power-system-juvenile-transport-program [https://perma.cc/75J5-AA7L].

68 *See* LISA CROZIER ET AL., NAT'L MARINE FISHERIES SERV., PASSAGE AND SURVIVAL OF ADULT SNAKE RIVER SALMON WITHIN AND UPSTREAM FROM THE FEDERAL COLUMBIA RIVER POWER SYSTEM: 2014 UPDATE (Aug. 2015).

69 *Id.* at 37–39.

70 *See* NOAA FISHERIES, *supra* note 60.

71 *High Level Indicators 1a*, NW. POWER & CONSERVATION COUNCIL, https://app.nwcouncil.org/ext/hli/level1.php?q=fw [https://perma.cc/9AYW-FE67] [hereinafter *High Level Indicators 1a*].

72 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 29.

at Bonneville Dam at just over 2.5 million salmon and steelhead in 2014, but by 2018, only 726,210 fish were counted.[73]

With respect to the upstream return migration, the smolt-to-adult return goal is set between 2% and 6%.[74] Measurements since 2013 indicate a downward trend, sinking to or below 2% for several ESUs of spring and summer salmon and steelhead.[75] Currently, enough concrete stands between fish and their historical habitats that 40% of once-available spawning grounds are now completely cut off.[76] Where passage through dams is available, it does not occur through spillways and weirs like the downstream journey. Instead, a fish ladder is the simplest means for the fish to make up the difference in elevation from the bottom of the dam to the top.[77] These passages are like a staircase, with water flowing from the top of the dam down to the river at the bottom, allowing the fish to swim up.[78] However, not all dams are equipped with a ladder passage, which can be a costly improvement to add retroactively.[79] The placement of the ladder's end relative to spillways, as well as higher water temperatures, can lead to a "fallback" effect in fatigued fish, where upstream adults fall back over the dam after reaching the upper reservoir.[80] Stress, coupled with time spent in migration and water temperature, can have detrimental effects on survival during both juvenile and adult migration.[81] Currently, however, the Council indicates that survival for certain salmon and steelhead has improved overall between the Bonneville Dam, the first lower Columbia River dam, and the Lower Granite Dam, the final lower Snake River dam.[82] While this seems to counter the dominant narrative of ongoing decline, different measurements of different ESUs

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73 *High Level Indicators 1a*, *supra* note 71.

74 *High Level Indicators 1f*, NW. POWER & CONSERVATION COUNCIL, https://app.nwcouncil.org/ext/hli/chart.php?q=smolt_returns [https://perma.cc/4M8D-QGMD].

75 *Id.*

76 *See Dams: Impacts*, *supra* note 65.

77 *See Adult Upstream Passage on the West Coast*, NOAA FISHERIES (Sept. 27, 2019), https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/adult-upstream-passage-west-coast [https://perma.cc/NVJ2-V87H].

78 *Id.*

79 *Id.*

80 Tami S. Reischel & Theodore C. Bjornn, *Influence of Fishway Placement on Fallback of Adult Salmon at the Bonneville Dam on the Columbia River*, 23 N. AM. J. FISHERIES MGMT. 1215, 1215 (2003).

81 CROZIER ET AL., *supra* note 68, at 53–54.

82 *High Level Indicators 2c*, NW. POWER & CONSERVATION COUNCIL, https://app.nwcouncil.org/ext/hli/chart.php?q=survival_adult [https://perma.cc/FYZ8-8P2D].

unsurprisingly may yield different results. Improvement in this one area, however impressive, is not a marker of widespread success. With an abundance of variables in play within this system, close monitoring of changes in fish survival patterns becomes only more critical.

The physical threats of the hydropower system are one piece of the puzzle, and, at the same time, deficiencies in the law and policy governing the FCRPS impose their own threats. One challenge is in the fish recovery standards of the BiOp itself. Though Section 7 consultation for federal actions is independent of the Northwest Power Act, the minimum species impacts permitted under Section 7 are incongruent with the Act's fish recovery goals. Under the NMFS BiOp, an action agency may act in a way that harms—but does not jeopardize—a fish population and still comply with federal law. Underscored by the requirements of Section 7 of the ESA and the BiOp itself, approval of agency action is based on a lack of excessive harm.[83] This serves as tacit permission from the consulting agency to adversely affect endangered species to the extent the agency deems permissible.[84] The same permissible standard applies to degradation of fish habitat.[85]

Under independent standards for fish harm and recovery, the possibility of actually protecting, mitigating, or enhancing fish habitats as the Plan requires is neutralized if an agency can damage habitat to any magnitude shy of jeopardy under the ESA.[86] Such lawful agency actions then become the limiting factors for basin-wide fish recovery. Unsurprisingly, habitat protection, mitigation, or enhancement costs make up the overwhelming majority of the Fish and Wildlife Program's expenses.[87] Ongoing permissive harm due to fishery and habitat damage below jeopardy levels frustrates the purpose of fish recovery funding under the Plan, and fish recovery efforts overall have thus far been doomed to stagnation. To analogize, a driver who wishes to stop their car from rolling downhill cannot merely take their foot off the accelerator and call it stopping—they must use the brakes. In addition to the double bind created by the current legal standards, other limitations threaten to further thwart fish recovery.

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83 2019 BiOp, *supra* note 41, at 27.

84 *Id.* at 51.

85 *Id.*

86 *Id.*

87 *See* NW. POWER & CONSERVATION COUNCIL, 2018 COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM COSTS REPORT 4 (Mar. 2019), https://www.nwcouncil.org/sites/default/files/2019-5_0.pdf [https://perma.cc/CJQ7-JREC] [hereinafter 2018 COST REPORT].

III
FLEXIBLE SPILL SOLUTIONS AND LIMITATIONS

The history of dissatisfaction and conflict in the FCRPS is a lengthy one, including the tradition of challenging nearly every iteration of inadequate NMFS BiOps in federal court. In 2016, Judge Michael Simon presided over litigation to determine whether NMFS acted arbitrarily and capriciously in finalizing the then current 2014 BiOp, which determined that operations of the FCRPS did not jeopardize listed fish.[88] The scope of his frustration was clear in *National Wildlife Federation v. National Marine Fisheries Service*.

> [T]he option of breaching, bypassing, or even removing a dam may be considered more financially prudent and environmentally effective than spending hundreds of millions of dollars more on uncertain habitat restoration and other alternative actions.
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> . . . .
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> More than 20 years ago, Judge Marsh admonished that the Federal Columbia River Power System "cries out for a major overhaul." Judge Redden, both formally in opinions and informally in letters to the parties, urged the relevant consulting and action agencies to consider breaching one or more of the four dams on the Lower Snake River. For more than 20 years, however, the federal agencies have ignored these admonishments and have continued to focus essentially on the same approach to saving the listed species—hydro-mitigation efforts that minimize the effect on hydropower generation operations with a predominant focus on habitat restoration. These efforts have already cost billions of dollars, yet they are failing. Many populations of the listed species continue to be in a perilous state.[89]

Rather than adhering to the status quo, recent legal and policy developments suggest flexible spill operations may be one way to address the deficiency emphasized in *National Wildlife Federation*. Flexible spill operations draw water over the top of the dam through spillways, halting or reducing hydropower production,[90] and allowing fish to pass through without the risk of collision with the turbines. This is necessarily at the sacrifice of some electricity generation, as the turbines see reduced flow rates during these operations. Flexible spill is broadly understood as having newfound potential to improve

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88 Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 184 F. Supp. 3d 861, 868 (D. Or. 2016).

89 *Id.* at 875–76 (footnote omitted).

90 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 140.

juvenile fish survival.[91] In addition to the direct mitigation of safer passage through a spillway, the greatest survival improvement is the abatement of the delayed mortality effect, where fish deaths occur sometime after the stressful downstream passage.[92] Both these aspects are factored into calculations of "incidental take" under the ESA, making these improvements dually impactful.[93] From the energy generation perspective, however, the implications of flexible spill operations are not without a caveat.[94]

Flexible spill structure creates inherent tension with Bonneville's core mission of electricity and revenue generation, which Bonneville factors into its losses and operating costs.[95] Although this would appear to create friction with the first prong of the Northwest Power Act's directive, Bonneville already accounts for forgone power sales as a means of satisfying its obligations under the second prong of the Act. Essentially, flexible spill or not, electricity ratepayers bear the ultimate cost of implemented measures specifically to remedy the harms the development and operation of electric generation facilities causes.[96] Moreover, Bonneville already experiences periods of excess power, as the energy grid is dynamic and constantly susceptible to change.[97] While flexible spill is effectively an intentional, calculated loss of revenue, it need not be a cause for alarm to those concerned with balance sheets. Millions of dollars are spent annually for hazing sea lions[98] and spoiling Caspian tern nesting habitats[99] as predation reduction, both of which come from the same overall budget.[100] Neither of these programs has been demonstrably successful, despite the sticker cost of $490 million of Fish and Wildlife Program allocation.[101]

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91 Letter from regional scientists on spill recommendations for Northwest policymakers. Jack E. Williams et al., *Dear Northwest Policymaker*, SAVE OUR WILD SALMON (Aug. 16, 2017), https://www.wildsalmon.org/images/factsheets-and-reports/2017-Scientists-spill-letter-gen-final.pdf [https://perma.cc/YJ8V-V4KG].

92 2019 BiOp, *supra* note 41, at 340.

93 *Id.* at 769, 851.

94 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 209.

95 2018 COST REPORT, *supra* note 87, at 5.

96 FISH AND WILDLIFE PROGRAM, *supra* note 26, at 14.

97 BONNEVILLE POWER ADMIN., FACT SHEET: MANAGING SEASONAL POWER OVERSUPPLY (May 2018), https://www.bpa.gov/news/pubs/FactSheets/fs-201805-Managing-seasonal-power-oversupply.pdf [https://perma.cc/H9XX-SQ3R].

98 2019 BiOp, *supra* note 41, at app. B 50.

99 *Id.* at app. C 80.

100 2018 COST REPORT, *supra* note 87, at 14.

101 *Id.*

In a briefing on flexible hydropower operations to Bonneville's Regional Implementation Oversight Group, officials noted that while flexibility in the hydropower system may complicate the integration of other renewable energy sources as well as power transmission, achieving greater flexibility will not be dismissed as an option going forward.[102] Because of the seasonality of fish migration, it is possible that dam operations can be adjusted such that forgone sales occur within temporal boundaries.[103] Other natural seasonal variables could be factored into this decision-making as well. Winters in this region see the most precipitation, allowing for greater water storage, whereas spring and summer snowpack melt and water runoff can yield higher flow conditions.[104] Furthermore, energy demands may change based on weather and time of year.[105] This will prompt Bonneville to adapt hydroelectric generation targets to focus on minimum generation levels on a project-by-project basis rather than annual fixed values.[106] For the time being, flexible spill remains a hopeful, if imperfect, change to the status quo.

By the end of 2018, collaboration between the action agencies, the states of Oregon and Washington, and the Nez Perce Tribe, led to the development of the Flexible Spill Operations Agreement.[107] This agreement was officially filed with the district court during the remand period following the initial litigation in *National Wildlife Federation*.[108] This agreement marked a shift from litigation to cooperation for the time being, indicated by a signed agreement prohibiting further litigation on spill operations and related matters during the remand period.[109] In addition to spill operations, the agreement called for the eventual cessation of juvenile transportation programs, a milestone in the recognition of delayed mortality

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102 Lydia Grimm & Jason Sweet, Bonneville Power Admin., An Introduction: Developing Tools for Flexible Hydrosystem Operations Post 2017 (July 19, 2017) (presentation slides) (on file with author).

103 *Id.*

104 NORTHWEST POWER PLAN, *supra* note 12, at 9–14.

105 *Id.*

106 Grimm & Sweet, *supra* note 102.

107 Status Report Re: 2019-2021 Spill Operations Agreement During the NEPA Remand Period, Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 184 F. Supp. 3d 861 (D. Or. 2016) (No. 3:01-CV-00640-SI), https://www.bpa.gov/efw/FishWildlife/SpillOperationAgreement/doc/ECF-2298_Spill-Notice-and-Agreement.pdf [https://perma.cc/Z3BE-C46L].

108 *Id.*

109 *Id.* at 3.

effects.[110] From the perspective of action agencies, the power losses have been manageable during the times of year which see downstream juvenile fish migration. According to Tim Dykstra, Senior Fish Program Manager of the Army Corps of Engineers Northwestern Division, "This year's [flexible spill] operation allows us to take advantage of the off-peak, lower power demand hours to provide 16 hours of spill for juvenile fish passage, while reducing spill for up to eight hours during periods of greater power demand."[111] This balance represents an approach that ought to be adopted system-wide: making calculated sacrifices to energy generation for the sake of the fish recovery programs that depend on minimizing the harms of the FCRPS. Where other Bonneville-funded recovery programs address only the symptoms of hydropower, flexible spill operations directly address the pathology of the FCRPS.

However, spill operations are no silver bullet, and the benefits of spill are limited to the downstream juvenile migration of the salmon or steelhead's journey. The excess flow of water during spill operations leads to increased levels of dissolved gases in the water, which comes with its own negative side effects for aquatic life and water quality. Under the BiOp, a maximum level of total dissolved gas must not be surpassed.[112] If more spill means more dissolved gas, the potential harms within the same ecosystem the spill operations aim to improve further limit the already limited benefits of flexible spill operations. Once again, a tension between the problem and a solution presents an unworkable and inadequate zone of overlap. The cure simply cannot exacerbate the disease. This represents a microcosm of the larger problems in the Columbia River Basin, as successful flexible spill is predicated on predictable hydrologic conditions and the existence of the current fleet of dams in the FCRPS. Even the most recent consultation documents from spring of 2020 admit the uncertainty of these preferred solutions in the face of climate change.[113] And as the

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110 Letter from David Ponganis, U.S. Army Corps of Eng'rs, to Barry Thom, NOAA Fisheries (Mar. 8, 2019), https://www.salmonrecovery.gov/doc/default-source/default-document-library/proposedaction2019crs.pdf [https://perma.cc/78MD-SA83].

111 *CBB: NOAA Releases New 2019 BiOp for Columbia Basin Salmon/Steelhead; Includes Flexible Spill*, SAVE OUR WILD SALMON (Apr. 2, 2019), https://www.wildsalmon.org/news-and-media/news/cbb-noaa-releases-new-2019-biop-for-columbia-basin-salmon-steelhead-includes-flexible-spill.html [https://perma.cc/2YC4-3DYA].

112 2019 BiOp, *supra* note 41, at 67.

113 U.S. ARMY CORPS OF ENG'RS ET AL., EXECUTIVE SUMMARY: COLUMBIA RIVER SYSTEM OPERATIONS DRAFT ENVIRONMENTAL IMPACT STATEMENT 13 (Feb. 2020),

Corps' statement reveals, calculation of peak and off-peak demand is central to enabling spill operations, making predictability of available generation critical to successful spill operations. Spill cannot remedy the widespread harms of damming a river and is ultimately a solution that still leaves the problem itself intact.

Spill or not, nothing about the current fish recovery scheme in the Columbia River Basin suggests a greater likelihood of success in a changing climate. Action agencies cannot continue engineering rivers out of one problem and into another, reducing the rivers of the Pacific Northwest into a carefully managed hydroelectric project in which the natural ecosystem is all but an inconvenience. Between fish transport on trucks, spending millions of dollars harassing sea lions and birds, implanting radio trackers in fish, artificially propagating fish in hatcheries, and engineering river flows to the last drop, it invites the question: at what point is the natural ecosystem no longer that? And if we have already crossed into the void, can anything be done to salvage nature and our relationship with it? Judge Simon's words at the beginning of this section may answer these questions. It is due time to consider dam removal as a solution for fish recovery and climate change.

More than perhaps any other force at play in the complex challenges of the Columbia River Basin, climate change threatens to thwart progress on fish recovery, energy generation, and flexible spill operations. The results of litigation in the FCRPS indicate that current planning efforts are too flawed to be resilient in a changing climate. Namely, impending ecological effects of climate change were a major factor in the aforementioned NMFS BiOp litigation. Accordingly, the court found that NMFS did not use the best available science and overlooked key aspects of climate change.[114] By definition, the best science should indicate harmful climate implications such as catastrophic events that would affect fish survival, reduced efficacy of proposed alternative actions, and how existing habitat actions may not see benefits for decades.[115] The court explained other harmful impacts to listed fish as well, including warming stream and ocean temperatures, contracting inland and ocean habitats, variable

https://cdm16021.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/13751 [https://perma.cc/3UFZ-8CPQ].

114 Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 184 F. Supp. 3d 861, 917 (D. Or. 2016).

115 *Id.*

precipitation and snowpack conditions, changes in peak river flows and flooding, forest fires, insect infestation, and susceptibility to pathogens.[116] The ripple effects of climate change are seemingly boundless, and the assessment of the federal court here bluntly reflects reality. Because of the gaps in planning for climate change, the hydropower system administered by Bonneville and federal action agencies is more vulnerable than ever.

Further scientific projections and measurements drive this assertion. First, snowpack levels and subsequent melt are critical variables for the ecosystem and the hydropower system. Long-term snowpack monitoring of the western United States has revealed declines of up to 90% in some areas.[117] This would render the hydropower system a battery with less charge. Less winter snow means less of the predictable seasonal melt-off in the spring and summer. For fish, this means that the same quantity of snow melt will not feed seasonal streams, contributing to already warming stream temperatures.[118] A Department of Energy (DOE) study for Congress from 2017 notes that the seasonal changes will likely be more pronounced than annual changes,[119] leading to greater variability throughout the year and throughout the highly seasonal fish migration cycles. The DOE projects decreased generation in the summer and fall across all Bonneville study areas due to earlier snowmelt and more variable seasonal runoff patterns.[120] Existing research from this study also indicates warmer average temperatures for the region, coupled with increased winter streamflow and decreased summer streamflow.[121]

While these projections do not anticipate significant changes in overall annual energy generation, seasonality is arguably the important metric for the hydropower system. Summertime energy demand tends to be higher, and a lower generation capacity during the summer poses

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116 *Id.*

117 Or. State Univ., *Snowpack Levels Show Dramatic Decline in Western States, U.S.*, SCIENCEDAILY (Mar. 2, 2018), https://www.sciencedaily.com/releases/2018/03/180302124830.htm [https://perma.cc/QXC8-FQV5].

118 Howard Hsu, *Climate Change Is Cooking Salmon in the Pacific Northwest*, POPULAR SCIENCE (Feb. 8, 2019, 4:00 AM), https://www.popsci.com/climate-change-salmon-pacific-northwest/ [https://perma.cc/QN6N-YAWY].

119 U.S. DEP'T OF ENERGY, EFFECTS OF CLIMATE CHANGE ON FEDERAL HYDROPOWER 9 (Jan. 2017), https://www.energy.gov/sites/prod/files/2017/01/f34/Effects-Climate-Change-Federal-Hydropower-Program.pdf [https://perma.cc/FLT2-E79N].

120 *Id.* at 12.

121 *Id.* at 16.

a risk for hydropower resources on the grid.[122] One resulting risk for the FCRPS is the need for energy replacement purchases accompanying any timing changes for renewable generation.[123] The Pacific Northwest's fish populations, however, face other risks from the seasonality of climate impacts to the hydrologic system. Summertime stream temperatures are the highest of the year, meaning that already high temperatures in reservoir slack water will continue to rise, leaving fish more vulnerable to heat death in the stagnant impoundments.[124] But forecasts for climate change are far different than a meteorological forecast for tomorrow. While the Washington Department of Energy anticipates drier summers but no variation in average temperatures, the National Climate Change Assessment models forecast an 11%–12% decrease in precipitation from 2030 to 2050.[125] These differences in models and projections highlight the possibility that even legitimate, peer-reviewed science can reach different conclusions when attempting to dial in on highly specific issues. In response, considering the ineffective status quo, drastic measures must be considered to quickly address the limitations of fish recovery, the legal and policy framework, and the threat of climate change.

IV
DOUBLE DIPPING: DAM REMOVAL FOR FISH RECOVERY AND CLIMATE DEFENSE

Similar to the requirements under the ESA to consult under Section 7, under the National Environmental Policy Act (NEPA), major federal agency actions that may significantly affect the human environment require certain procedural steps be taken before the agency acts, including the production of an Environmental Impact Statement (EIS).[126] A key difference between NEPA compliance and the

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122 *Id.* at 17.

123 *Id.*

124 *Why Restoration of the Lower Snake River Is Necessary to Save Wild Salmon*, EARTHJUSTICE (July 31, 2020), https://earthjustice.org/features/remove-four-lower-snake-river-dams [https://perma.cc/4H9F-ZL65].

125 ECONORTHWEST, LOWER SNAKE RIVER DAMS ECONOMIC TRADEOFFS OF REMOVAL 64 (July 29, 2019), https://static1.squarespace.com/static/597fb96acd39c34098e8d423/t/5d41bbf522405f0001c67068/1564589261882/LSRD_Economic_Tradeoffs_Report.pdf [https://perma.cc/CQ8P-RAY2].

126 Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 184 F. Supp. 3d 861, 878–79 (D. Or. 2016).

substantive requirements of Section 7 of the ESA is that NEPA is a purely procedural statute.[127] So long as the agency follows NEPA's steps, including public notice and comment and considering alternative actions, including a no-action alternative, to the fullest extent possible, compliance is achieved. This is, of course, notwithstanding any litigation on the procedural requirements, which frequently stalls federal actions that may harm the environment.

Federal agencies have had turbulent guidance concerning the recognition of climate change in the NEPA review as of late—as of this writing, the Biden Administration has reversed a 2019 Trump Administration order limiting climate change consideration in the NEPA review process.[128] However, when the February 2020 draft EIS ("Draft EIS") for maintenance operations in the FCRPS was released, members of the public saw new climate change considerations featured prominently in the planning document despite relaxed guidance from the Trump Administration.[129] Additionally, removal of the four lower Snake River dams was considered as an alternative action to further maintenance and operation.[130] The fact that a climate change analysis has made its way into the Draft EIS at all signals that the federal action agencies are at least anticipating climate change to affect fish recovery planning and hydropower operations. Supplementary publications from the Corps, Bonneville, and the Council all include detailed information indicating their preparedness for impending climate change challenges and a certain level of readiness to address these harms.[131] Prior to the release of the Draft EIS, the action agencies' Regional Management Joint Operating Committee published climate and hydrology datasets for long-term planning.[132] The stated research

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127 *See* National Environmental Policy Act of 1969, 42 U.S.C. § 4332(2)(C).

128 Valerie Volcovici, *White House Revokes Trump Order Limiting Climate Change in Federal Reviews*, REUTERS (Feb. 18, 2021, 8:09 AM), https://www.reuters.com/article/us-usa-climate-ceq/white-house-revokes-trump-order-limiting-climate-change-in-federal-reviews-idUSKBN2AI2BQ [https://perma.cc/H4RV-MVR2].

129 U.S. ARMY CORPS OF ENG'RS ET AL., COLUMBIA RIVER SYSTEM OPERATIONS DRAFT ENVIRONMENTAL IMPACT STATEMENT 1–18 (Feb. 2020), https://cdm16021.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/13752 [https://perma.cc/PAD2-A59C] [hereinafter DRAFT EIS].

130 *Columbia River Systems Operations Draft Environmental Impact Statement*, BPA.GOV (Feb. 28, 2020), https://www.bpa.gov/news/newsroom/Pages/Columbia-River-System-Operations-draft-environmental-impact-statement.aspx [https://perma.cc/68CH-WKQ2].

131 *See* CITIZEN'S GUIDE, *supra* note 62.

132 BONNEVILLE POWER ADMIN. ET AL., CLIMATE AND HYDROLOGY DATASETS FOR RMJOC LONG-TERM PLANNING STUDIES: SECOND EDITION (RMJOC-II) (June

purpose was to seek better data across a range of climate scenarios and identify systemic vulnerabilities.[133] However, by not giving more serious weight to the prospect of dam removal, the action agencies have yet to consider the full scope of climate change vulnerabilities. Despite scientists acknowledging in the current BiOp that dam removal would give fish populations the best chance at long-term survival, removal of the four lower Snake River dams was not selected as the preferred alternative in the final EIS, approved in the fall of 2020.[134] Litigation on this decision, once again, is expected.[135]

If enacted, it is uncontested that removal of the four lower Snake River Dams offers the most benefits and the best chance for survival for listed fish populations—environmental legal experts, conservation organizations, and the EIS itself converge on this conclusion.[136] This is hardly news. Prior to the issuance of a 1995 BiOp, salmon survival advocates and scientists suggested drawing down reservoir levels and eventually breaching dams, launching a new policy conversation into the infancy of its present momentum.[137] The willingness to discuss breach in mainstream policy conversation has evidently come a long way; the current Draft EIS plainly acknowledges that removal of the four lower Snake River dams offers the highest benefits for listed fish.[138] Given the scientific understanding of the benefits of breach, it is only more disappointing that, after decades of fish advocacy, the proposal for breaching dams has largely been given short shrift. The Draft EIS itself concedes that, according to the collaborative Comparative Survival Study modeling, an increase in adult returns of salmon and steelhead populations could exceed 170% relative to the

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2018), https://www.bpa.gov/p/Generation/Hydro/hydro/cc/RMJOC-II-Report-Part-I.pdf [https://perma.cc/24GK-CKDB].

133 *Id.* at 1–2.

134 Record of Decision; Columbia River System Operations Environmental Impact Statement, 85 Fed. Reg. 63,834 (Oct. 8, 2020).

135 Sixty-Day Notice of Intent to Sue from Earthjustice to U.S. Army Corps of Eng'rs, Bureau of Reclamation, and Bonneville Power Admin. (Oct. 22, 2020), https://earthjustice.org/sites/default/files/files/1404_2020_biop_60-day_notice_letter.pdf [https://perma.cc/HFJ7-9HYS]; Pete Danko, *Oregon Threatens Lawsuit over Columbia and Snake River Dam Operations*, PORTLAND BUS. J. (Nov. 24, 2020), https://www.bizjournals.com/portland/news/2020/11/24/oregon-notice-of-intent-to-sue.html [https://perma.cc/LX9M-P98L].

136 Williams et al., *supra* note 91; *see* EARTHJUSTICE, *supra* note 124; *see also* DRAFT EIS, *supra* note 129, at 24.

137 Blumm & Powers, *supra* note 59, at 248–50.

138 DRAFT EIS, *supra* note 129, at 24.

no-action NEPA alternative with removal of the four lower Snake River dams.[139] Climate change will only exacerbate the existing "four Hs" threats to fish, and yet the one option that is all but certain to improve fish survival is being consciously avoided, or at least stalled.[140] Dam removal can benefit fish recovery and defend against the worst of climate impacts only if it is actually given a chance to succeed. While seemingly radical, there are many reasons to consider dam removal as the most straightforward solution compared to the costly and inefficient status quo. Frustratingly, the EIS is dismissive of dam removal due to concerns around barging and energy replacement. Only when read in addition to independent studies can the full picture be understood.

While Bonneville and other action agencies are obligated to facilitate both prongs of the Northwest Power Act, the costs of dam removal assessed in the EIS are quite broad, including recreation, navigation, irrigation, rail transportation, and more. Overstating these concerns seems disingenuous, as if to leverage select information to alert farmers that the tangential effects of dam removal spell doom. For the sake of offering a counternarrative to this example, barge traffic on the Snake River has slowed to all-time lows in recent years, with a traffic decline averaged over the four years leading up to 2017 showing a 71% drop compared to the grain transportation of 1998.[141] In 2017, the Port of Lewiston on the Snake River in Idaho shipped a grand total of zero containers by barge.[142] Despite six-figure net operating losses since 2014, this port in particular required $11 million in taxpayer spending just to dredge out the accumulated sediment and will require dredging every three to five years.[143] This information was not highlighted by the EIS. This juxtaposition is not to delegitimize concerns from wheat growers or barge users—a holistic examination of the benefits and detriments of dam removal should be a part of the conversation. However, under NEPA, the Northwest Power Act, or the Northwest Power Plan, it is unclear why such auxiliary considerations as the speculative price of a bushel of wheat constitute warnings about

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139 *Id.* at 25.

140 Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 184 F. Supp. 3d 861, 874, 876 (D. Or. 2016).

141 Linwood Laughy, *Lower Snake River Commerce Hits All-Time Low*, IDAHO RIVERS UNITED (Jan. 4, 2018), https://www.idahorivers.org/newsroom/2018/1/4/2017-lower-snake-river-freight-transportation-review [https://perma.cc/A9TA-DLZ3].

142 *Id.*

143 *Id.*

dam removal, while external research shows that such "side effects" may be less drastic than portrayed in the Draft EIS.

Similarly, the energy generation tradeoffs of hydroelectric removal would not necessarily spell doom or contradict climate change mitigation efforts as the EIS suggests. While accounting for energy replacement quickly complicates the prospects of dam removal, the math is riddled with imprecise variables and estimations due to fluctuating costs of current dam operations and uncertain predictions of future energy costs.[144] Still, unpredictable power demand events such as sudden peak energy demands could feasibly render the FCRPS more vulnerable to failure without the quickly dispatchable hydropower online.[145] In order to account for worst-case scenarios, action agencies must analyze all costs and benefits. This means placing dollar values on tangibles, such as the price of a kilowatt per hour or the cost of dam maintenance, and weighing it against intangibles, such as the best likelihood of survival for salmon and steelhead. To be realistic, this analysis must also account for future energy development trending toward cleaner solutions, rather than including energy forecasts on further fossil fuel development.[146]

To that end, the EIS estimated power replacement costs totaling between $500 million and $1 billion annually, a 10% increase in greenhouse gas emissions and a 50% increase of wholesale electricity rates.[147] Two years prior to the release of the Draft EIS, however, the NW Energy Coalition (NWEC) commissioned a comprehensive study focused on the feasibility of removing the four lower Snake River dams with a detailed cost-benefit analysis.[148] The extensive study resulted in a lengthy plan for power replacement based in part on data from the Council, a major player in ensuring the power and fish recovery obligations of the Northwest Power Act are satisfied. The NWEC study found a range of power replacement scenarios with different greenhouse gas attributes, ranging from an annual cost of $165 million to $1.1 billion.[149] While the upper reaches of this cost forecast compare

144 *See* Todd Myers, *The Environmental Tradeoffs of Removing Snake River Dams*, 53 IDAHO L. REV. 209, 230–32 (2017).

145 *Id.*

146 *Contra id.* at 228–29.

147 DRAFT EIS, *supra* note 129, at 26–27.

148 ENERGY STRATEGIES, LOWER SNAKE RIVER DAMS POWER REPLACEMENT STUDY (Mar. 2018), https://nwenergy.org/wp-content/uploads/2018/04/LSRD_Report_Full_Final.pdf [https://perma.cc/6E68-Y4Y7].

149 *Id.* at 65.

to the Draft EIS, the NWEC study arrived at its numbers as a result of four different scenarios, which included increasing energy efficiency, demand response, and increased wind and solar generation. These variables were not explicitly considered in the Draft EIS and would further constrain the costs to between $165 million and $400 million annually.[150]

Another study by the financial planning and economics firm, ECONorthwest, took on a cost-benefit analysis, which included externalities and auxiliary costs along the same lines as the scope the action agencies in the Draft EIS considered. Here, rather than coming to a conclusion that dam removal was a financial detriment, ECONorthwest valued the totality of removal costs at $4.3 billion and the total benefits at nearly $13 billion.[151] The net benefits of $8.65 billion were found in reduced costs to the expensive Fish and Wildlife program, recreation, ecosystem services, net job creation, savings in federal appropriations for dam maintenance, and the value of native fish populations.[152] While the resources to make a dam removal plan feasible with respect to climate change may not be a present reality, new technology and new policy on the horizon make such projections only more realistic and reflect the Pacific Northwest's regional attitude toward a proactive climate future. For example, just prior to the release of the Draft EIS, seventeen utilities and conservation groups wrote to the governors of the Pacific Northwest states, urging more substantial regional dialogue addressing the long-term decline of ESA-listed fish in the lower Snake River.[153] This came in the wake of the Orcas Power & Light Cooperative utility board, which serves Washington's San Juan Islands, rescinding their opposition to removal of the four lower Snake River dams.[154] A growing public engagement on the issue of climate change has also prompted innovative consumer-side demand

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150 *Id.*

151 ECONORTHWEST, LOWER SNAKE RIVER DAMS ECONOMIC TRADEOFFS OF REMOVAL: EXECUTIVE SUMMARY 3 (July 29, 2019), https://static1.squarespace.com/static/597fb96acd39c34098e8d423/t/5d41be440a153e0001fee548/1564589713452/Lower Snake_ExecSummary_FINAL_ECONWV4+copy.pdf [https://perma.cc/QQ38-Q3D2].

152 *Id.*

153 Sean O'Leary, *Utilities, Environmental Groups Ask NW Governors to Address Snake River Salmon Issue*, NW ENERGY COAL. (Feb. 24, 2020), https://nwenergy.org/featured/17-utilities-and-groups-ask-nw-governors-to-address-lower-snake-river-salmon-issue/ [https://perma.cc/WAB8-72BD].

154 Sean O'Leary, *OPALCO Board Rescinds Resolution Opposing Dam Removal*, NW ENERGY COAL. (Jan. 24, 2020), https://nwenergy.org/featured/opalco-board-rescinds-resolution-opposing-dam-removal/ [https://perma.cc/8RWG-CWY7].

response, such as Portland Gas and Electric's Smart Grid Test Bed.[155] The Council anticipates that projects like this can account for over three-quarters of the region's new power and replacement power as high-carbon energy is retired and more renewable generation is integrated.[156]

Further substantiating the projections that support the cost effectiveness of dam removal, a new era of climate policy also refutes power replacement concerns. In Washington state alone, eight new climate-oriented bills have been introduced, including measures for electrified transportation, energy efficiency, distributed energy resources, and clean energy standards.[157] Across the Columbia River to the south, the governor of Oregon has taken early action as well, passing an executive order compelling state agencies to curb greenhouse gas emissions, increase energy efficiency requirements, and facilitate the electrification of transportation.[158] Most recently, and perhaps most excitingly, was a new proposal from an unlikely ally.

In February of 2021, Congressman Mike Simpson, an Idaho Republican, made headlines when he released his proposal to breach the four lower Snake River dams.[159] With an ambitious $33.5 billion minimum price tag, Simpson envisions a plan that brings all stakeholders together to accomplish a wide range of new strategies. Highlights include dam removal itself, a litigation moratorium, tribal partnerships, region-wide watershed improvements, clean-power funding, agricultural support, community-infrastructure funding, and

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155 Sean O'Leary, *PGE's Smart Grid Test Bed Pioneers Customer-Side Resources*, NW ENERGY COAL. (July 22, 2019), https://nwenergy.org/featured/pges-smart-grid-test-bed-pioneers-customer-side-resources/ [https://perma.cc/893A-LXKS].

156 *Id.*

157 Sean O'Leary, *Washington's Groundbreaking Climate Package Examined*, NW ENERGY COAL. (May 14, 2019), https://nwenergy.org/featured/examining-washingtons-groundbreaking-climate-package/ [https://perma.cc/K553-YWB9].

158 Dirk VanderHart, *Gov. Kate Brown Orders State Action on Climate Change*, OR. PUB. BROAD. (Mar. 10, 2020, 10:30 AM), https://www.opb.org/news/article/oregon-governor-kate-brown-climate-change-executive-order-cap-and-trade-bill/ [https://perma.cc/M8DE-Z72B].

159 Lynda V. Mapes, *GOP Congressman Pitches $34 Billion Plan to Breach Lower Snake River Dams in New Vision for Northwest*, SEATTLE TIMES (Feb. 7, 2021, 11:58 AM), https://www.seattletimes.com/seattle-news/environment/gop-congressman-pitches-34-billion-plan-to-breach-lower-snake-river-dams-in-new-vision-for-northwest/ [https://perma.cc/H8QG-QT72]; *Salmon: The Columbia Basin Initiative*, U.S. CONGRESSMAN MIKE SIMPSON, https://simpson.house.gov/salmon/ [https://perma.cc/4BXB-U2X4].

many more opportunities for the region.[160] With the possibility of significant infusions of infrastructure funding under the Biden Administration, nothing about the plan nor its price tag is inherently unrealistic, especially when considering the already monumental costs incurred by years of failing fish recovery.[161] While Simpson admits he laughed the first time he heard dam removal pitched as a serious option, he epitomizes the prudence that addressing climate change and fish recovery requires.[162] "The reality," he said, "is we've tried everything else."[163]

CONCLUSION

Any attempt to preserve the status quo of the current Federal Columbia River Power System will undoubtedly come at the expense of irreplaceable natural and cultural resources. On the one hand, nothing about the FCRPS is permanent. The FCRPS requires human actors to perform active management, maintenance, and continual adjustment—a reminder that the powers that be in the Pacific Northwest and the federal government are real people with a crucial choice to make. On the other hand, the effects of the dams on salmon and steelhead very well may be permanent, as extinction looms on the horizon along with the impending consequences of climate change. In many ways, the incongruent legal obligations, years of litigation, and wasteful recovery programs can be blamed. But more simply, the physical impediments of the dams are what stand most directly in the way of the migrating fish. Removing those physical obstacles not only removes the human elements of policy, recovery management, and the law but also presents an opportunity for active improvement of the ecosystem and the communities of the Columbia River Basin.

This outlook is far more inspiring than the legal and policy gridlock that allows for all but sure extinction by permitting the dams' continued operations. For that reason, dam removal must not be written off as an impossibility. The consideration of breaching dams, which many

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160 *The Northwest in Transition: Salmon, Dams and Energy What If?*, U.S. CONGRESSMAN MIKE SIMPSON, https://simpson.house.gov/uploadedfiles/websiteslides2.4.pdf [https://perma.cc/NSH7-EDF8].

161 *Id.*

162 Orion Donovan-Smith, *Fate of Republican Mike Simpson's Plan to Remove Snake River Dams Lies with Democrats and Biden Infrastructure Package*, SPOKESMAN-REV. (Mar. 8, 2021), https://www.spokesman.com/stories/2021/mar/07/fate-of-republican-mike-simpsons-plan-to-remove-sn/ [https://perma.cc/ZU4K-DBJU].

163 *Id.*

perceive to be extreme, is still relevant and may prove to eventually be more economical and financially sensible than spending billions of dollars on inefficient fish recovery. Breaching of inefficient dams may eventually be the most hopeful and pragmatic consideration for fish survival. For now, reassessing the hydropower system's direct and indirect impacts on fish and closing the gaps in law and policy with genuine standards for future fish programs will help policymakers and stakeholders to recover anadromous fish in the Columbia River Basin.